A REPORT UPON

MAJOR STREETS AND TRANSIT

COLUMBUS URBAN AREA

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City Planning Commission
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Gentlemen:

We are pleased to submit herewith our preliminary report on "Major Streets, Parking and Transit", which is the second in the series of reports comprised in the preliminary planning program.

Streets provide the framework of the city structure. The failure to plan for safe and adequate major streets well in advance of urban development in the past has resulted in acute and ever increasing congestion in most of our large urban centers. To correct these conditions or even to bring about substantial improvement in circulation facilities is not now an easy task. However, much can be accomplished over a period of years by consciously following a carefully prepared plan for a coordinated major street system. New subdivisions and building activities should be correlated and public improvements programmed in accordance with the plan.

The provision of adequate off-street parking spaces is now recognized as an improtant aspect of the traffic problem. It is also recognized that mass transportation and the private automobile are complementary means of transportation, provision for each of which is essential in a well balanced street and highway system. While these subjects have been treated as to present conditions and desirable improvements, no long-range parking or transit plans have been prepared due to the exigencies of the preliminary planning program.

During the preparation of these studies we have received the excellent cooperation of many individuals, officials and organizations. We particularly wish to express our appreciation for the assistance given by the State Highway Department Planning Survey, the City and County Engineers as well as the staffs of your Commissions.

Respectfully submitted,

HARLAND BARTHOLOMEW AND ASSOCIATES

By Russell H. Riley

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INTRODUCTION

The very existence of a community depends on communication, transportation and public service facilities. Ample streets and highways are essential to all facets of everyday living, getting to work, operating a business, marketing goods and shopping, enjoying cultural and social intercourse, and even to recreation or pleasure riding. Streets also furnish a location for the vast network of underground and overhead utilities--telephone, electricity, gas and water lines, sanitary sewerage, etc.--which serve all parts of the community. Thus, streets comprise the basic framework of the urban pattern.

The present traffic difficulties in Columbus as in most other large urban centers stem from the inadequacies of past street design and arrangement. Broad Street, High and other downtown arteries reveal, however, that the city's original street layout was conceived on a broader scale and with greater vision than subsequent additions to the plan. The original designers of the street system had no conception of current demands, and the large amount of vacant land made it practicable to provide generous street areas. It is the numerous additions, rather than the original plan, which have set the pattern of the present day community. While it was only in recent decades that the need for wide streets for moving vehicles was becoming apparent, land values were theretofore increasing and provisions for streets were far less generous. Thus, Columbus, like other American cities, is largely a heterogeneous patchwork of individual developments, mostly uncoordinated, bearing little conscious relationship to each other and almost none to an over-all design for the community as a whole. Existing streets are generally narrow, disconnected, or uneven in character so as to be inadequate for smooth traffic flow, and easy movement is further complicated by the many railroads and the necessity for bridging, even though with relatively short structures, of the four principal streams which traverse the urban area.

A generation or more ago, before the advent of the automobile, narrow streets were quite satisfactory. With the ever increasing numbers of private cars, together with the growing population, existing street pavements became entirely inadequate, particularly when forced to serve the double functions of accommodating vehicular movement and on street parking. Despite the expansion of the urban area and the concomitant increase in the volume of traffic, especially along major routes, the streets themselves have remained unchanged with much the same rights-of-way and

pavement widths as originally established. Ribbon commercial development along so many of the major thoroughfares in Columbus has contributed materially to the increase of traffic and the lack of adequate capacity to accommodate same. It will ultimately be costly, but absolutely essential, to bring many of the principal arteries up to modern standards capable of meeting future requirements.

Another traffic problem in Columbus, which is perhaps graver than that in the average American city, is the exceptionally large volume of traffic presently forced into or through the central business district by the almost complete lack of good crosstown and circumferential routes. Due in part to the partial barriers imposed by the Scioto and Olentangy Rivers and other streams, in part to the extensive excavation of limestone and gravel which has created several hundreds of acres of wide, deep pits,in part to the large railroad yards to the east, and to other factors, it is almost impossible to travel between widely separated portions of the urban community without going through the center of the city or at least from one to several miles farther than any other reasonably direct route between these points. The development of new crosstown and circumferential thoroughfares is imperative to improvement of present traffic conditions in the downtown district as well as in other sections of the community.

A good system of major thoroughfares should be designed to promote the most desirable and appropriate development of each part of the urban area,as well as to serve the convenience and efficiency of the area as a whole. Thus, recognition should be given to existing and future commerce and industry as well as to residential districts. Instead of the present dispersion of traffic over many residential streets, a relatively few high capacity, strategically located arteries should be developed to handle this traffic, and residence neighborhoods, wherever possible, should be protected and preserved from the annoyance of extraneous traffic. Major thoroughfares should follow the boundaries of new neighborhoods, rather than traverse them, and new major arteries, such as expressways, should be located wherever possible along natural physical features or along the borders of principal industrial, commercial or residential districts. A major thoroughfare system, in short, should be made to support the most desirable environment for work, for play and for good living conditions in general as well as to serve the necessary functions of accessibility and circulation between all parts of the community.

The first requirements in planning any thoroughfare system are an appraisal of the existing streets and a determination of the needs and characteristics of traffic flow. Thus, answers must be found to the questions what are the traffic volumes now? What will this traffic be 10, or 20, or 25 years from now? Where does the traffic originate? Where does it wish to go? What is the pattern created or to be created, by the locations of homes and stores and industries, by the schools and athletic fields and theatres and the myriad places where people go?

Columbus has recently begun the building of a system of expressways which will be a major feature of the future thoroughfare program. A plan of other major streets is needed, however, to complement as well as to supplement the expressway system, so that the most effective and fullest utilization may be made of the latter in addition to creating good facilities for communication between all parts of the city and the urban area beyond. The proposed expressway system has been studied and in minor instances, modifications recommended, in order to coordinate all traffic arteries with the principal traffic movements throughout the Columbus area.

General principles and standards to be followed in the development and administration of a major thoroughfare system are set forth in the sections which follow. The existing street system, the volume and trend of current and future traffic, and other factors influencing the development of a major street system are also discussed. The various types of thoroughfares which make up the proposed system are described along with plans of typical street improvements suggested for development of the new thoroughfares.

PRINCIPLES AND STANDARDS OF A MAJOR STREET SYSTEM

Experience has shown that large volumes of traffic can best be handled over a relatively few direct, well improved thoroughfares, rather than over a large number of local streets. This has many advantages. For example, traffic control is greatly simplified; only a small portion of the over-all street system need be paved to thoroughfare standards; and residential streets are afforded relief from disrupting and undesirable extraneous traffic. Street construction and maintenance are far less costly since minor streets, comprising from 75 to 80 percent of the total street mileage, require only comparatively light pavements and narrow widths to serve their main function of access to abutting property. Such local streets need a right of way of only 50 to 60 feet, and frequently only a three lane pavement to handle local vehicular and pedestrian traffic.

Types of Streets

In general, major streets should be designed as a network to take care of the principal movements of traffic between residence districts and centers of employment in industry and trade and, of course, the central business district. Following is a summary discussion of the several types of routes that should comprise a comprehensive system of major streets.

Radial Thoroughfares

The central business district is the hub or main focal point of traffic in the city. Various streets and highways radiate outward from this area like the spokes of a wheel, providing access to and from major segments of the urban area and direct routes to the countryside and communities beyond. Consequently, radial arteries carry the largest volumes of traffic and, with a few exceptions, make up an important part of the state and Federal highway systems through the urban area. Columbus, like many other large cities, has a good system of radial thoroughfares even though many of these streets are quite inadequate in width.

Crosstown Streets

There is also a substantial volume of traffic within the urban area between various secondary focal points such as between different residence districts and between certain residence districts and the University section or main shopping and industrial centers. This type of movement is generally indirect and difficult in Columbus, due partly to the narrowness and discontinuity of crosstown streets and partly to the physical barriers imposed by the rivers and creeks and the numerous railroad lines. The absence of direct routes between secondary traffic foci not only makes this travel

needlessly circuitous, but forces much traffic through the congested central business district. A good system of crosstown thoroughfares would reduce the load on many of the heavily travelled radial arteries. In so far as possible, crosstown streets should be planned to intersect the radials at strategic points for accommodating these movements without bisecting residence neighborhoods. Crosstown streets need not be of the same high standards as radials, but they should be of sufficient width to take care of the traffic without delay or congestion and to encourage their use rather than spilling over on radials or on minor parallel streets.

Circumferential Routes

Circumferential routes vary somewhat in function and character, but they are basically continuous loops at different distances from the central business district. One of their principal functions is the creation of more or less direct routes between widely different parts of the city without the necessity for traversing the downtown district or other congested areas. They may be classified as of several types:

1. A by-pass route enabling close-in traffic to skirt the central business district without crowding through it, as mentioned above.

2. An intermediate loop at some distance from the business district which connects most of the major centers of industrial employment and other secondary foci within the urban area.

3. A belt or by-pass route at the outer edge of the future urban area connecting major highway approaches to the city and allowing this traffic to go around most of the urban area.

Expressways and Modified Expressways

While surface thoroughfares through repaving, widening and good traffic control can carry a substantial volume of traffic, there is a limit to their developable capacity. Furthermore, the cost of such improvements, particularly of widening rights-of-way, may become so great as to be unwarranted in relation to the possible traffic increase. Under these conditions, it may be more desirable, and less costly in the long run, to provide entirely new, specially designed, high capacity arteries, or expressways, as they are commonly called. Limitation of access and absence of grade intersections on these roadways provide a continuous

flow of traffic, thereby permitting large numbers of vehicles to move freely and swiftly from the central business district to residential and industrial areas. An expressway loop should skirt the central business district, as contemplated in the Columbus expressway system now under initial construction. Where possible, radial expressways should follow natural barriers such as railroads or streams and act as separators between major industrial and residential areas.

Outside the congested areas where traffic volumes or other conditions do not justify complete separation of grades, a modified type of expressway using surface roadways may be developed. This can be accomplished by closing certain minor streets to eliminate unnecessary intersections and even separating grades at major thoroughfare crossings when the conditions and traffic flow warrant. Limitation of access at the time of acquiring right-of-way for such routes will help to increase traffic capacities by holding the intersections to a minimum.

Street Construction Standards

Experience over the past three decades has brought about the wide acceptance of standards for the development and construction of a system of major thoroughfares. While it is not always practicable to comply with these standards completely, they should be followed as closely as physical conditions and finances permit. Basically, all major thoroughfares should be of ample width, smoothly paved, of easy gradient and direct alignment. Street intersections should be held to a minimum, and all intersections should be controlled by means of appropriate signs and traffic signals.

High standards are required in the design and development of limited access thoroughfares and expressways where rapid and uninterrupted travel is the major objective. Wider rights-of-way than on ordinary major streets are needed to accommodate wider traffic lanes along with medial and marginal strips between the roadway and abutting property for purposes of protection, and still more land is needed for interchange ramps at the major street intersections. The separation of grades or elimination of intersections with other streets along with proper acceleration and deceleration lanes is necessary to provide for continuous, uninterrupted traffic flow.

Width and Capacity of Traffic Lanes

The width of the street pavement should obviously be related to the volume of traffic which it is expected to carry. For purposes of design, the critical volumes are those occurring daily during the morning and evening rush hours. Under ideal signal conditions at these periods, a single traffic lane can accommodate about 500 cars per hour. Primary major streets should provide at least four moving lanes, and within the more intensively developed sections of the city, dominant radials will need at least six moving lanes.

Within certain limits the width of a traffic lane affects both its capacity and the speed of traffic movement. Capacity is affected also by the proportion of trucks and the presence or absence of transit lines. Ordinarily, the minimum width of traffic lanes or arteries carrying substantial numbers of trucks or transit vehicles should be at least eleven feet, and twelve foot lanes should be provided for moving traffic on expressways. The commonly accepted standard for curb parking lanes is eight feet.

Street Cross Sections

Suggested designs or cross sections of the principal types of streets within the Columbus urban area are shown on Plate 1. This indicates both standards for new or widened streets and utilization of the different rights-of-way and street improvements already in existence.

Expressways, which are normally depressed below surface streets, require variable widths of right-of-way, depending upon topography and adjacent development. A desirable minimum right-of-way width is 200 feet, and the present Columbus expressway program assumes a basic right-of-way width of 300 feet where feasible. The width of the roadway pavement remains constant between interchanges with a medial strip of 20 feet except in intensively developed areas where a separator of four feet may be used. Lanes for acceleration and deceleration are required at interchanges. The number of traffic lanes varies between four and six under the present Columbus expressway program, based on the anticipated volumes of traffic. A typical cross section indicating at least three lanes in each direction is shown on Plate 1. Practical capacity of this facility is estimated at 1200 to 1500 vehicles per lane per hour.

Belt or circumferential routes, like the expressways, are designed to carry heavy traffic volumes for considerable distances. In order that they may be of maximum effectiveness, points of access should be limited as much as possible, particularly in new areas, where intersections may be spaced from one half to one mile apart. It is sometimes feasible to close certain minor access streets across the belt line, especially where new rights-of-way are acquired, thereby providing for modified expressway design. Under either of these conditions, the traffic carrying capacity of such a boulevard is somewhat greater than that of a corresponding regular major street, being conservatively estimated at 750 to 1000 cars per lane per hour. The belt line, as shown on Plate 1, is adaptable to construction in stages by first utilizing a single 24 foot pavement on one side of the center line until traffic volumes justify construction of a second roadway. The medial strip of 20 feet is adequate to provide space for a deceleration and left turn lane at grade intersections.

Six lanes will be required on the more important radial routes such as High Street, Cleveland Avenue, and U.S. 62. A pavement of this width, including parking, ordinarily requires a right-of-way of at least 110 feet, although 100 feet may have to be used in closely developed areas. As shown on Plate 1, a right-of-way width of 110 feet would accommodate six moving lanes of eleven feet each, separated by a four foot divider, and two parking lanes of eight feet each. Where necessary for special turning lanes or transit stops, parking could be eliminated on either or both sides. With a 100 foot right-of-way, the moving lanes would be reduced to ten feet each, and the planting strip on either side of the roadway cut from seven to five feet. A minimum ten foot lane is far less satisfactory than the wider pavement, particularly where truck traffic is substantial, but may be justified because of widening costs. The practical capacity of this type of thoroughfare is estimated at 400 to 500 cars per lane per hour.

Many of the radial routes will have four moving lanes. Examples of this type are Indianola, Sullivant, and Parsons Avenues. Four moving lanes of eleven feet each plus two parking lanes require a minimum right-of-way width of 80 feet. This would leave a ten foot space on each side of the roadway to be improved either with a sidewalk or with a sidewalk and planting strip. Additional traffic capacity could also be accommodated by prohibiting parking on either or both sides of the street, particularly during peak periods. The estimated practical capacity is about 450 cars per lane per hour.

There are two types of minor streets--(1) those used purely for access to abutting property and (2) local collector streets. The latter serve the purpose of collecting and distributing traffic within residential neighborhoods and the various areas between major and secondary streets and will require a minimum 60 foot right-of-way and a pavement of 36 to 40 feet. Local access streets need only a 26 foot roadway for movement and parking--In modern subdivision design most of the parking is located off-street--which can be accommodated on a 50 foot right-of-way, leaving 12 feet on either side for a 5 foot sidewalk and a 7 foot planting strip.

In parts of the older, intensively developed sections of Columbus it will not be economical or practicable to widen existing streets because of the high costs in proportion to the traffic capacity gained. Under these conditions it is necessary to make the maximum use of existing pavements and right-of-way widths and cross sections have been prepared to show how some of these streets can be utilized.

A number of streets, notably Front, Long, Gay, Third and Fourth Streets in downtown Columbus have a width of five rods or 82.5 feet, with an existing pavement of 52.5 feet. This is sufficient to provide three ample moving lanes of 12 feet and two parking lanes on a one-way streets. If and when these streets are repaved, the roadway width on two-way streets should be increased to at least 56 feet to accommodate four moving lanes. Parking may ultimately have to be prohibited on both the one-way and two-way streets, at least during rush hours, to provide additional moving lanes in the future.

There are several streets or parts of streets in the city, such as East Main, which have a right-of-way of 80 feet. This will permit a 60 foot pavement or six 10 foot moving lanes without parking, plus a 5 foot sidewalk and a 5 foot planting strip on either side of the roadway. In business districts a 10 foot sidewalk without planting would be desirable.

A right-of-way width of 66 feet, which is now found in parts of the city (for example, Mound and East Long Street) can best be utilized for four 11 foot moving lanes, without parking. This allows room on each side for a 5 foot sidewalk and a 6 foot planting strip, or in business districts an 11 foot walk.

A 60 foot right-of-way is not adequate for a major street, but may have to serve the purpose of a secondary artery in a few cases. Under these conditions, parking should be prohibited and a 40 foot roadway utilized for four 10 feet driving lanes.

A few streets to be developed as part of the major street system have a right-of-way of only 50 feet. These streets, such as Wheatland, would be used in pairs one-way with a 32 foot pavement consisting of two 12 foot driving and an 8 foot parking lane.

THE EXISTING STREET SYSTEM

Traffic in Columbus as in most other large cities, has tended to follow the line of least resistance in the past, using those streets which to the majority of motorists at the moment seemed to afford the easiest and fastest routes. Over the years certain arteries which were wider or smoother or a little more direct than other streets attracted more traffic and gradually became established as primary traffic ways. This has not prevented, however, the dispersion of traffic on many minor streets, disrupting residential neighborhoods and creating additional problems of traffic control and higher street maintenance costs. Until relatively recent years there has been no designated system of thoroughfares--apart from the State and Federal highways--which attempted to utilize existing streets and existing street funds in the most economical and effective way.

The development of a good system of designated major streets is essential to the functioning of the myriad business, commercial, cultural and social activities in the modern city. Such major routes should provide easy communication between all sections and all traffic foci within the urban community. The major street system should also include the primary State and Federal routes which bring traffic from rural areas and from other communities directly into or through the city.

State and Federal Highways

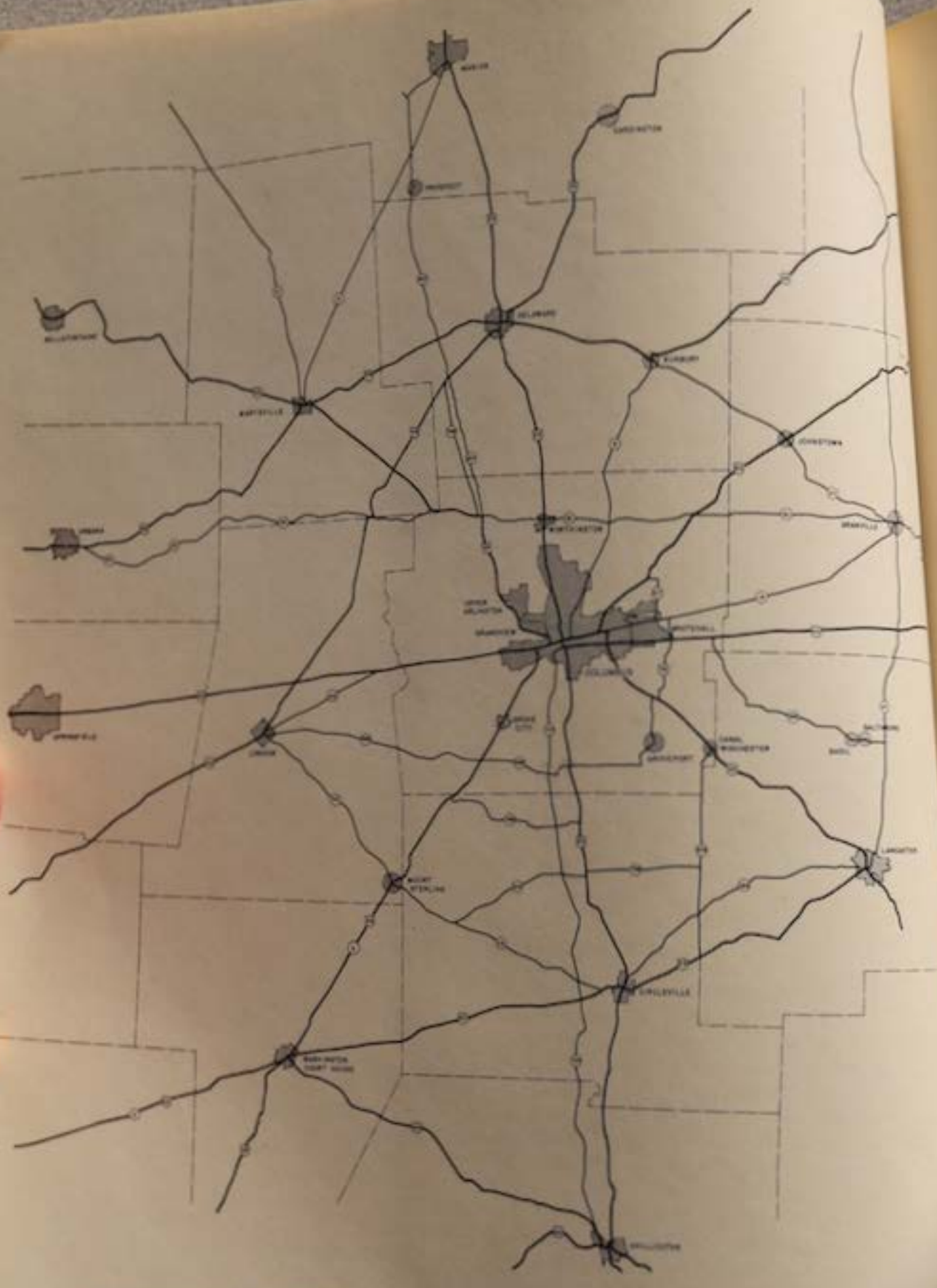
Columbus is the focal point of a number of primary State and Federal highways; altogether some 16 important State and Federal routes pass through or skirt the Columbus urban area. There are four Federal highways which intersect within the city. These are: (1) Route 23 extending from Detroit and Toledo to Miami; (2) Route 62 from El Paso, Texas to Buffalo; (3) Route 33 from southwest Michigan to the east central coast; (4) Route 40 from San Francisco to Baltimore. These highways create a system of eight routes radiating in all directions from the city and connecting Columbus with most of the major communities in this section of the country. Two of these routes are a part of the Federal system of interstate highways: (1) U.S. 40 which joins a number of the large cities between the east and west coast, including Salt Lake City, Denver, Kansas City and St. Louis, in addition to the others mentioned,and passes through Columbus from the west and east; and (2) routes U.S. 62 and Ohio 3 from the southwest and northeast.

Plate 2 shows the relation of State and Federal routes intersecting Columbus to other urban places in central Ohio. It should be recognized that while the amount of through traffic is probably not particularly large in proportion to the total, provision should be made in the highway and thoroughfare plan to accommodate these vehicles on arteries which will make for their own convenience in bypassing the city, as well as relieving local thoroughfares of unnecessary traffic. This is especially true of truck traffic over U.S. 23 to and from Toledo and south or southeast Ohio.

It should also be noted that the existing Federal and State routes, especially the various radials, carry large amounts of local traffic originating and destined for points within the urban area. How best to meet this situation has become a matter of growing concern to Federal, State and local officials. Existing rights-of-way are entirely inadequate in many cases to take care of the volumes of traffic being generated and the efficiency of streets such as East Main, West Broad and High Street, all parts of Federal routes, are materially diminished by the ribbon commercial developments. The planning of new highway routes and the protection of new or existing highways from adverse conditions through zoning and better highway design will grow increasingly more important as traffic increases in the future. Limited access thoroughfares or freeways are now the best means for handling large volumes of traffic such as are formed on these routes.

Existing Right-of-Way Widths

While street pavements can sometimes be widened without great difficulty, the street right-of-way is fixed by law and the original dedication and is generally difficult to increase without considerable cost. It is the right-of-way which determines the feasibility of increasing traffic capacity on a particular thoroughfare by widening the pavement to provide additional traffic lanes, and consequently the existing right-of-way width is a principal factor in planning the major street system. Unfortunately, existing development is generally most intense at the very points where traffic congestion is greatest, and frequently such property is so substantial and the widening of the street right-of-way so costly that an alternate, even if less satisfactory, route must be found.



PRIMARY STATE AND FEDERAL HIGHWAYS

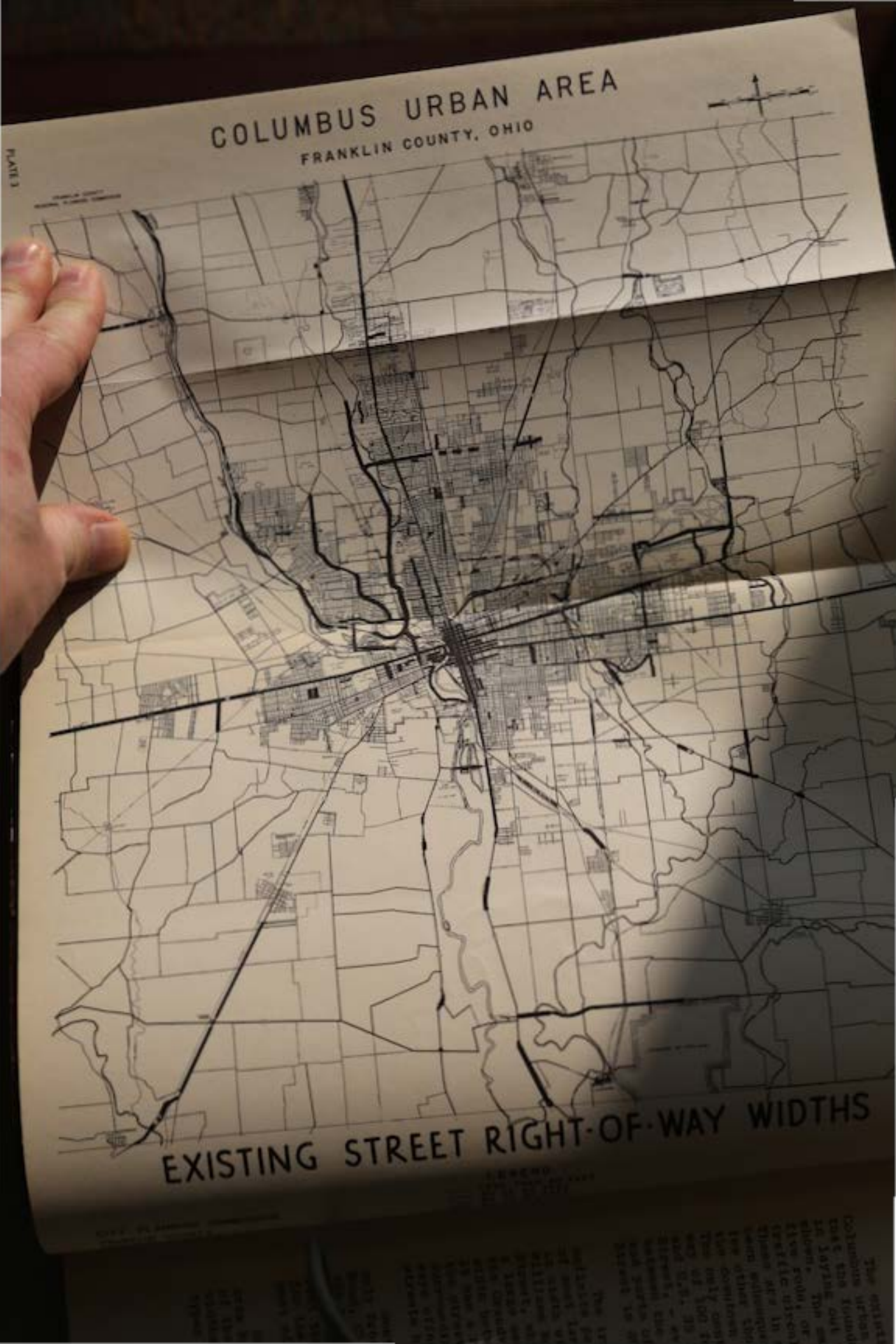
IN THE VICINITY OF COLUMBUS, OHIO

CITY PLANNING COMMISSION

FRANKLIN COUNTY
REGIONAL PLANNING COMMISSION

PLATE 2

HARLAND BARTHOLOMEW AND ASSOCIATES
CITY PLANNERS
SAINT LOUIS MISSOURI


COLUMBUS URBAN AREA
FRANKLIN COUNTY, OHIO
PLATE 1
EXISTING STREET RIGHT-OF-WAY WIDTHS

The existing street right-of-way widths within the Columbus urban area are indicated on Plate 3. It is evident that the founders of the city exhibited much greater vision in laying out the original plats than their successors have shown. The majority of the streets in downtown Columbus are five rods, or 82.5 feet, in width which is fortunate for traffic circulation within the central business district. These are in marked contrast with the traffic ways which have been subsequently laid out; only Broad Street and a relatively few other thoroughfares or parts of thoroughfares outside the downtown section have a right-of-way of 80 feet or more. The only continuous streets having the fairly ample right-of-way of 100 feet are Olentangy River Road, Northwest Boulevard and U.S. 33 in the northwest sector of the community, and Broad Street, - even the latter narrows down to 80 to 89 feet between the Scioto River and Columbus' west corporate limits, and parts of U.S. 33 vary from 66 to 80 feet. East Main Street is 80 feet for most of its length.

The irregularity of existing widths and the lack of a definite pattern in the general street layout are characteristic of most large American cities. For example, High Street varies in width within the city from 100 to 66 feet and south of Williams Road this narrows down to only 60 feet. Fifth Street, which is the only continuous east-west artery in a large section of the community between Port Columbus and the Grandview Heights - Upper Arlington districts, varies in width between 50 and 60 feet, except along the airport where it has a right-of-way of 100 feet. Lack of continuity in the street system is especially marked in the section surrounding Ohio State University with most of these traffic ways offset on either side of High, and few of the east-west streets having continuity across the New York Central Railroad.

Most of the radial thoroughfares are well located, but only Broad Street has an ample width. Columbus-Millersburg Road, Cleveland Avenue, U.S. Route 33 and U.S. 62, among the more important radials, have rights-of-way of only 60 feet, and even Broad Street narrows to 83 and then to 66 feet through parts of Whitehall and farther east. Except for the thoroughfares in the northwest, previously described, most of the other radials are 60 to 66 feet.

Most of the streets within the present Columbus urban area have rights-of-way no greater than 50 feet. The majority of the streets south and east of Ohio State University have widths of 60 feet, which is not adequate to accommodate the types of pavement needed for circulation in this district,

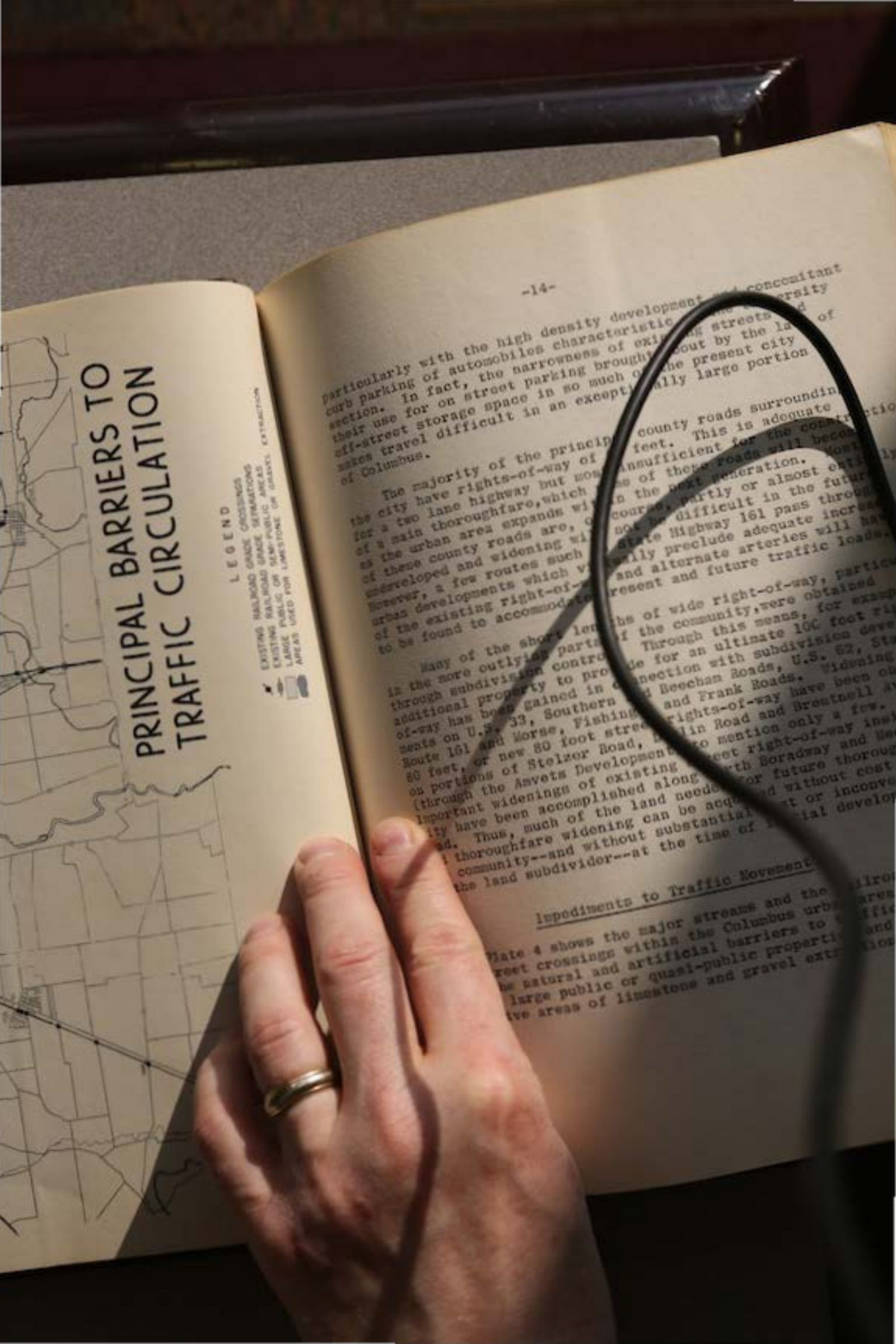
particularly with the high density development and concomitant curb parking of automobiles characteristic of the University section. In fact, the narrowness of existing streets and their use for on street parking brought about by the lack of off-street storage space in so much of the present city makes travel difficult in an exceptionally large portion of Columbus.

The majority of the principal county roads surrounding the city have rights-of-way of 60 feet. This is adequate for a two lane highway but most insufficient for the construction of a main thoroughfare, which some of these roads will become as the urban area expands within the next generation. Most of these county roads are, of course, partly or almost entirely undeveloped and widening will not be difficult in the future. However, a few routes such as State Highway 161 pass through urban developments which virtually preclude adequate increase of the existing right-of-way and alternate arteries will have to be found to accommodate present and future traffic loads.

Many of the short lengths of wide right-of-way, particularly in the more outlying parts of the community, were obtained through subdivision control. Through this means, for example, additional property to provide for an ultimate 100 foot right-of-way has been gained in connection with subdivision developments on U.S. 33, Southern and Beecham Roads, U.S. 62, State Route 161 and Morse, Fishinger and Frank Roads. Widening to 80 feet, or new 80 foot street rights-of-way have been obtained on portions of Stelzer Road, Dublin Road and Brentnell Avenue (through the Amvets Development) to mention only a few. Important widenings of existing street right-of-way inside the city have been accomplished along North Boradway and Mecca Road. Thus, much of the land needed for future thoroughfares and thoroughfare widening can be acquired without cost to the community--and without substantial cost or inconvenience to the land subdivider--at the time of initial development.

Impediments to Traffic Movement

Plate 4 shows the major streams and the railroad lines and street crossings within the Columbus urban area together with the natural and artificial barriers to traffic created by the large public or quasi-public properties and the extensive areas of limestone and gravel extraction.


PRINCIPAL BARRIERS TO TRAFFIC CIRCULATION
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EXISTING RAILROAD GRADE SEPARATIONS
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AREAS USED FOR LIMESTONE OR GRAVEL EXTRACTION
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Impediments to Traffic Movement

Plate 4 shows the major streams and the ... street crossings within the Columbus urban ... the natural and artificial barriers to ... large public or quasi-public properties ... tive areas of limestone and gravel extraction.

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EXISTING RAILROAD GRADE CROSSINGS
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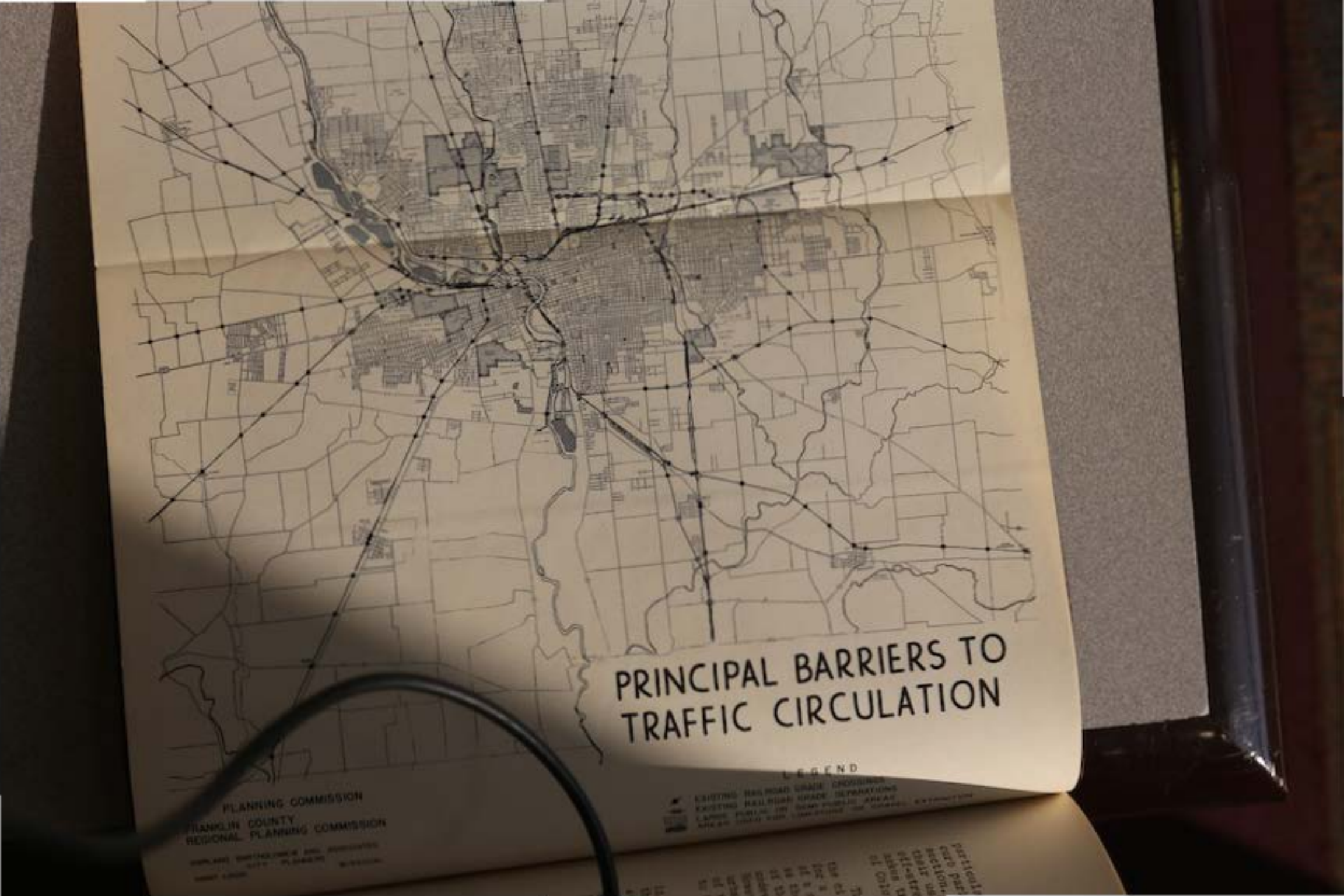
LARGE PUBLIC OR SEMI-PUBLIC AREAS
AREAS USED FOR LIMESTONE OR GRAVEL EXTRACTION


PRINCIPAL BARRIERS TO
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FRANKLIN COUNTY
REGIONAL PLANNING COMMISSION

particularly with the high density development and concomitant curb parking of automobiles characteristic of the University section. In fact, the narrowness of existing streets and their use for on street parking brought about by the lack of off-street storage space in so much of the present city makes travel difficult in an exceptionally large portion of Columbus.

The majority of the principal county roads surrounding the city have rights-of-way of 60 feet. This is adequate for a two lane highway but most insufficient for the construction of a main thoroughfare, which some of these roads will become as the urban area expands within the next generation. Most of these county roads are, of course, partly or almost entirely undeveloped and widening will not be difficult in the future. However, a few routes such as State Highway 161 pass through urban developments which virtually preclude adequate increase of the existing right-of-way and alternate arteries will have to be found to accommodate present and future traffic loads.

Many of the short lengths of wide right-of-way, particularly in the more outlying parts of the community, were obtained through subdivision control. Through this means, for example, additional property to provide for an ultimate 100 foot right-of-way has been gained in connection with subdivision developments on U.S. 33, Southern and Beecham Roads, U.S. 62, State Route 161 and Morse, Fishinger and Frank Roads. Widening to 80 feet, or new 80 foot street rights-of-way have been obtained on portions of Stelzer Road, Dublin Road and Brentnell Avenue (through the Amvets Development) to mention only a few. Important widenings of existing street right-of-way inside the city have been accomplished along North Boradway and Mecca Road. Thus, much of the land needed for future thoroughfares and thoroughfare widening can be acquired without cost to the community--and without substantial cost or inconvenience to the land subdivider--at the time of initial development.

Impediments to Traffic Movement

Plate 4 shows the major streams and the railroad lines and street crossings within the Columbus urban area together with the natural and artificial barriers to traffic created by the large public or quasi-public properties and the extensive areas of limestone and gravel extraction.

Even though the Scioto and Olentangy Rivers are not as difficult or costly to bridge as those in some communities--due here to the flat topography throughout most of the urban area and the relative narrowness of the streams--existing crossings are still comparatively few, being limited to four or five bridges across the Scioto (at Grandview Avenue, Trabue, Fishinger, Hayden Run and Dublin-Granville Roads) and some nine crossings over the Olentangy, in addition to the crossings at Sandusky and the several principal east-west thoroughfares downtown. South of the central business district the Scioto can now be crossed at only two points--at Greenlawn Avenue and at Frank Road south of the city. The two creeks are not major traffic impediments, but even these cannot be crossed at will. If good traffic circulation is to be brought about in all parts of the Columbus urban area, it will be necessary to construct several additional bridges, particularly across the Scioto, in the future, which will be discussed later.

There is a number of large public or institutional properties which tend to obstruct circulation in parts of the community although these are not quite so serious, despite their large areas, as they might have been. For example, Ohio State University and the University Farm occupy areas of several hundred acres which would be most formidable barriers except for the existence through them of Neil Avenue, Lane Avenue and Kenny Road. Even so, the relatively intense development of the Ohio State University campus and its importance as a traffic generator both add to the volumes of traffic movements and make difficult the provision through this area of adequate relief streets. The State Fairgrounds is a considerable traffic generator during the periods of its use but will not impede traffic circulation if proper provision is made in its further development for the widening of 17th Avenue and construction of the north freeway. The State institutions on West Broad Street, however, pose a problem with respect to traffic movement in a north-south direction between Central Avenue and Wheatland Avenue, a distance of well over one mile. The extension or connection of Grandview Avenue to the south to provide better access between West Columbus and the Grandview Heights-Upper Arlington districts would be very desirable. The other large public properties, such as Port Columbus and the Army Depot are at the edge of the urban area and except in the directions north and south do not interfere with normal traffic flow.

In addition to the two rivers and the other natural barriers, and perhaps somewhat more serious from a circulation standpoint, artificial barriers to traffic have been created along the Scioto by the extensive mining of limestone and gravel. The wide, deep pits remaining after the removal of

limestone in particular, virtually preclude construction of a new thoroughfare of any kind across the wide area along Dublin Road and McKinley Road. The distance between Grandview Avenue and Fishinger Road is over four miles and the only crossing between these points is located at Trabue Road. It will be both difficult and expensive until parts of this area have been filled to provide additional communication between Grandview Heights, Upper Arlington and West Columbus, even though such outlets will be badly needed with further development of the industrial area to the west.

The extraction of gravel along State Highway 104 south of the city is also creating conditions which will be unfavorable to development of good traffic arteries across this section in the future. Because of operations already completed north of Frank Road, a satisfactory connection to eliminate the offset in the two parts of this road north of the sewage treatment plant is rendered more difficult and if these operations are continued to the south, this connection will be practically impossible. All of these areas are located within parts of the community desirable for future urban growth and they should not be despoiled by this kind of non-urban land use.

The numerous rail lines entering the city from all directions impose a problem of considerable magnitude in planning a good street system. Railroad crossings at grade--and there are many of these in the Columbus urban area, as can be seen from Plate 4--make traffic both hazardous and subject to annoying delays. The alignment of major new routes must be studied to create a minimum of railroad intersections and such intersections in so far as possible should be located where topography and other conditions favor separation of grades. While it is not within the province of the present study to treat this problem in detail, it will be necessary to carry out a grade separation program in the future, particularly along the more important outlying major streets, in addition to the separations which have already been made -- many of the important street crossings have already been separated inside the city. Unfortunately, however, the existing roadways are not entirely adequate to carry present and future traffic loads at a number of these points.

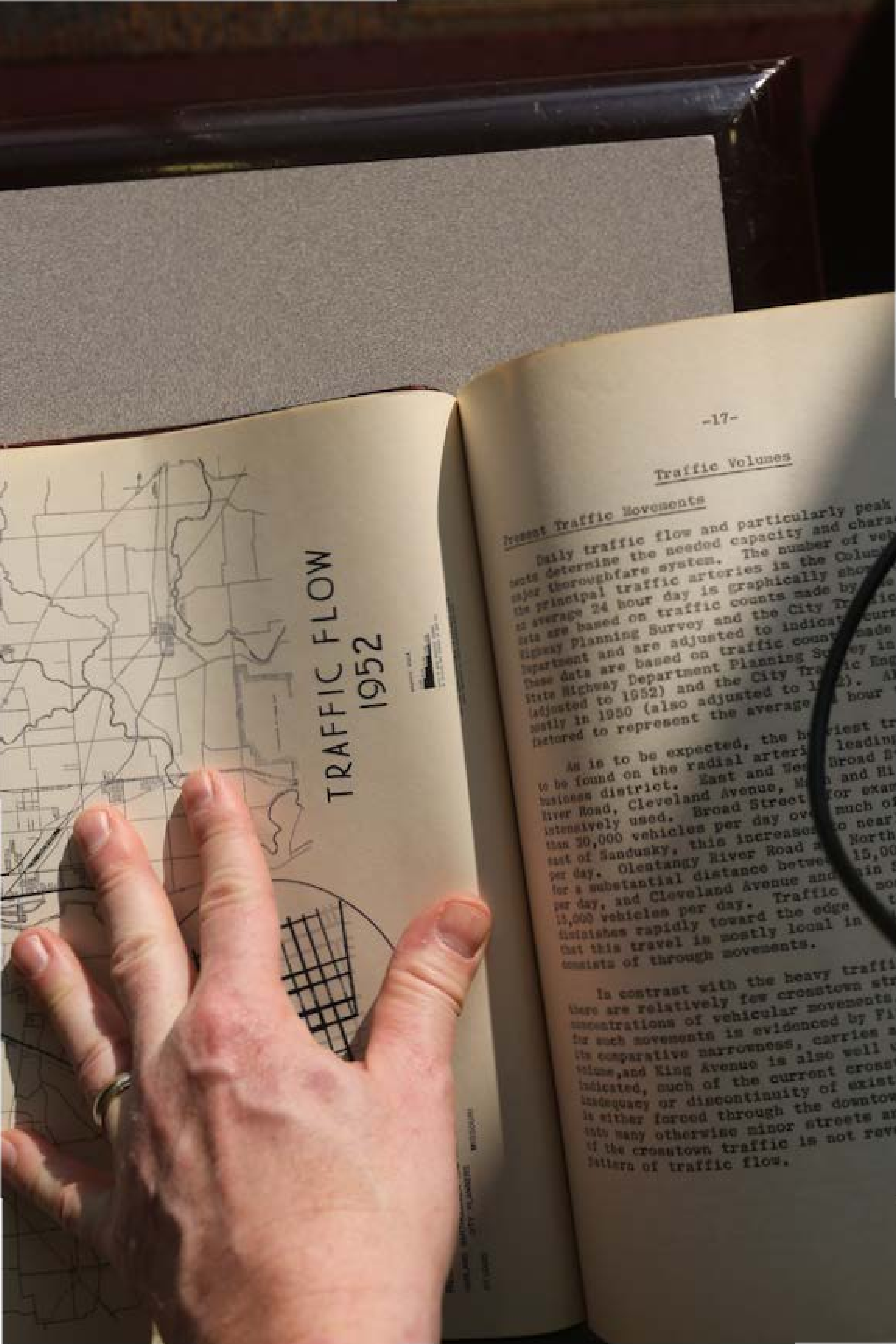
Traffic Volumes

Present Traffic Movements

Daily traffic flow and particularly peak traffic movements determine the needed capacity and character of the major thoroughfare system. The number of vehicles using the principal traffic arteries in the Columbus area during an average 24 hour day is graphically shown on Plate 5. These data are based on traffic counts made by the Ohio State Highway Planning Survey and the City Traffic Engineering Department and are adjusted to indicate current volumes. These data are based on traffic counts made by the Ohio State Highway Department Planning Survey in 1952 and 1953 (adjusted to 1952) and the City Traffic Engineering Department, mostly in 1950 (also adjusted to 1952). All counts were factored to represent the average 24 hour traffic flow.

As is to be expected, the heaviest traffic volumes are to be found on the radial arteries leading into the central business district. East and West Broad Street, Olentangy River Road, Cleveland Avenue, Main and High Streets are all intensively used. Broad Street, for example, averages more than 20,000 vehicles per day over much of its length and east of Sandusky, this increases to nearly 40,000 vehicles per day. Olentangy River Road and North High Street carry for a substantial distance between 15,000 and 20,000 vehicles per day, and Cleveland Avenue and Main Street average about 15,000 vehicles per day. Traffic on most of these routes diminishes rapidly toward the edge of the urban area, indicating that this travel is mostly local in origin and relatively little consists of through movements.

In contrast with the heavy traffic on radial thoroughfares, there are relatively few crosstown streets carrying large concentrations of vehicular movements. However, the desire for such movements is evidenced by Fifth Avenue which despite its comparative narrowness, carries a substantial traffic volume,and King Avenue is also well used. As previously indicated, much of the current crosstown traffic due to the inadequacy or discontinuity of existing crosstown routes is either forced through the downtown district or dispersed onto many otherwise minor streets and consequently that portion of the crosstown traffic is not revealed in the normal pattern of traffic flow.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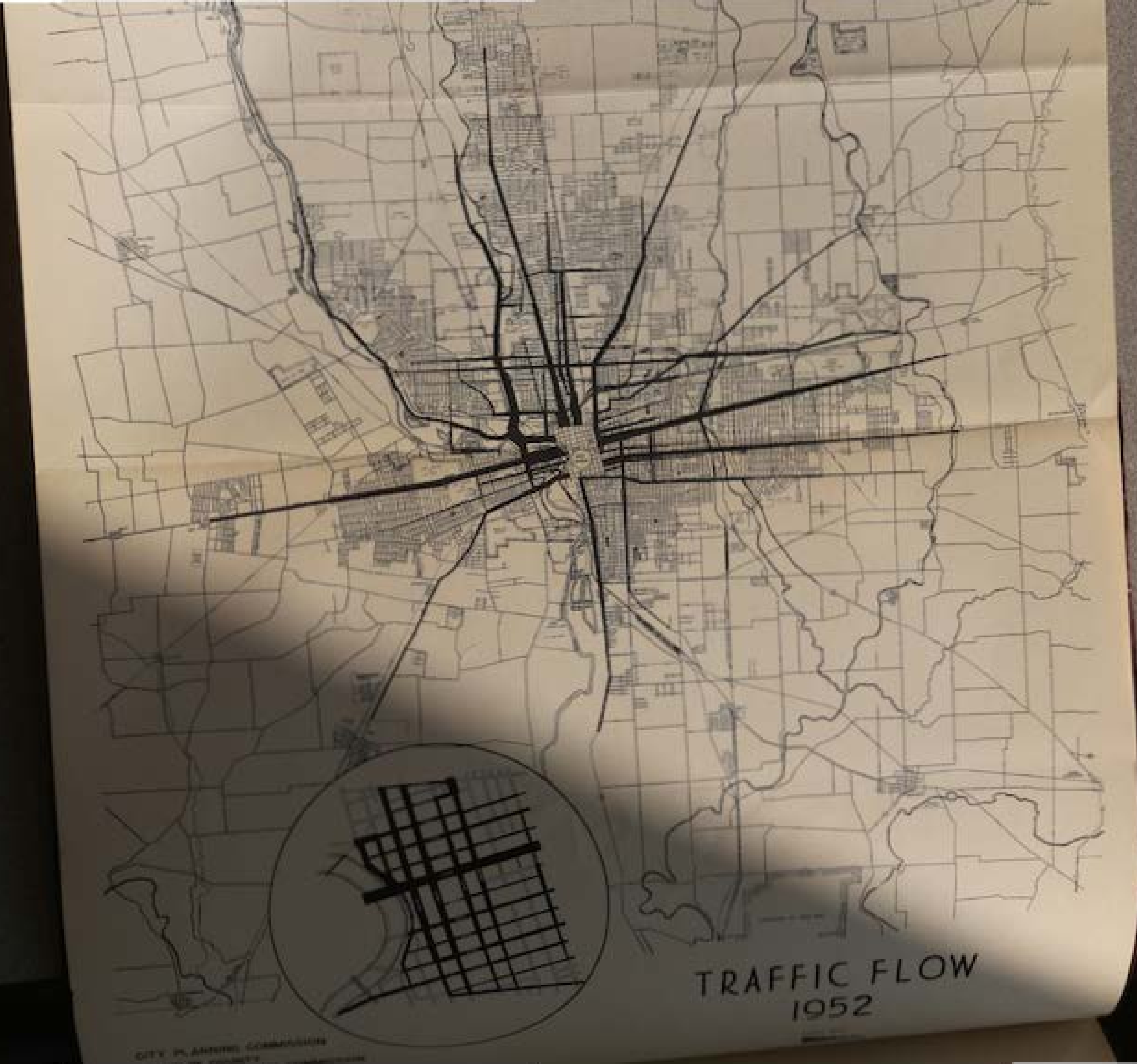
CITY PLANNING COMMISSION
FRANKLIN COUNTY
REGIONAL PLANNING COMMISSION


TRAFFIC FLOW
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CITY PLANNING COMMISSION

With the exception of Broad Street, which carries more than 30,000 cars per day through the downtown area, east-west arteries in the central business district show a well distributed traffic pattern. High and Front Streets both carry large volumes of north-south traffic, Front Street being the routing of U.S. 23 through the central area. Third and Fourth Streets are also heavily used, each street handling up to 20,000 cars per day in the vicinity of Broad. Traffic volumes on Fifth and Sixth Streets are relatively small due to the discontinuity of these ways and have not been shown.

In general Plate 5 shows the heavy use made of all the principal arteries leading to and through the central business district. The absence of large traffic volumes on crosstown streets indicates that a substantial part of this traffic uses the radial thoroughfares and such movements, of course, could be accommodated more directly and expeditiously on other streets. The development of good crosstown routes, in an east-west direction particularly, would relieve existing downtown thoroughfares and help the flow of traffic considerably through the University area and other parts of the north end.

Future Traffic Volumes

Future traffic volumes will be especially influenced by the future growth and the distribution of population and land uses in different parts of the Columbus area, as well as by changes or increases in the relative number of automobiles and in driving habits.

Total vehicle registration in Franklin County was approximately 100,800 in 1930; it declined to a low of less than 90,000 in 1933, and reached a peak of 120,000 or so immediately before World War II. Following the war, the number of vehicles has climbed rapidly, registrations exceeding 173,000 in 1950 and 192,600 in 1952. The latter figure included 20,461 trucks and commercial vehicles. On the basis of population, passenger vehicle registration represented one car for each four persons in 1930, one car for 3.8 persons in 1940, and one car for each 3.3 persons in 1950. The ratio is one car for each 3.2 persons or less at the present time. While continuation of this trend is not expected to be quite so pronounced in the future, it would not seem unreasonable to expect a ratio of one car for each 2.5 persons within the next twenty to thirty years. Assuming a future population within Franklin County of about 920,000, this would produce a registration of nearly 370,000 passenger cars by 1980, or more than double the number of passenger cars listed in 1952. In addition, the trucks and commercial vehicles can be expected to increase by not less than the rate of anticipated population growth.

Examination of trends in motor vehicle travel on state highways, gasoline sales and similar factors, indicate that the average travel in miles per vehicle is gradually increasing and that this may be expected to amount to as much as five percent greater mileage per car within the next generation. Assuming the increase in passenger cars described above, and similar though smaller increases in trucks and other commercial vehicles, an over-all traffic increase of from 100 to 120 percent could be expected by 1980. Actual traffic counts in Ohio since the last war have indicated that current volumes in the state are growing at the rate of about five percent per year. While such rapid increases are hardly likely to continue generally over a long period of years, the anticipated growth of the Columbus area in relation to the state as a whole would make an average increase in traffic here of four to five percent appear not at all unreasonable.

Applied to the present traffic pattern, this would mean that existing street capacities must be at least doubled in order to accommodate future traffic movements under approximately the same conditions, and that street capacities must be more than doubled to bring about substantial improvement in traffic flow. For example, the three portals to the central business district to and from the populous areas to the north now carry a total of about 69,000 vehicles per day (24 hours) north of Naghten Avenue, or about 6100 vehicles during the peak hour (between 8.5 and 9.0 percent of the 24 hour flow). Assuming that approximately 70 percent of this traffic is northbound at the peak period (which appears likely from flow characteristics in other cities and observation of traffic conditions in Columbus), this would mean that some 4270 vehicles were using the northbound lanes, and on the basis of a future 100 percent increase, about 8500 vehicles would have to be accommodated by 1980 or so. The proposed six lane north freeway can accommodate about 4500 vehicles northbound so that some 4,000 will have to be handled over surface streets. As noted above, these streets presently carry 4200 vehicles (with some difficulty) and unless present street capacities are increased, traffic conditions by 1980 would not be substantially improved over the present. On the basis of practical working capacities, Front Street, High and Fourth cannot be expected to handle easily more than 3750 vehicles per hour, and consequently these streets are already used beyond their capacity.

While street capacities can be increased here to some degree by better utilization of existing street pavements and better traffic control, as pointed out later, it will be necessary also to develop additional traffic arteries and traffic lanes. This can be done partly by means of the expressway system now under initial construction, and partly through the other elements of the Major Street Plan such as widening of existing streets and opening of new routes, described in the following section.

Due to the cost of widening existing street rights-of-way, very careful study was given to the possibilities of developing parallel one way streets so that widening would not be required. However, the local street system is so irregular and there is such a paucity of continuous parallel streets, that this proved impracticable except in limited instances.

PROPOSED MAJOR STREET PLAN

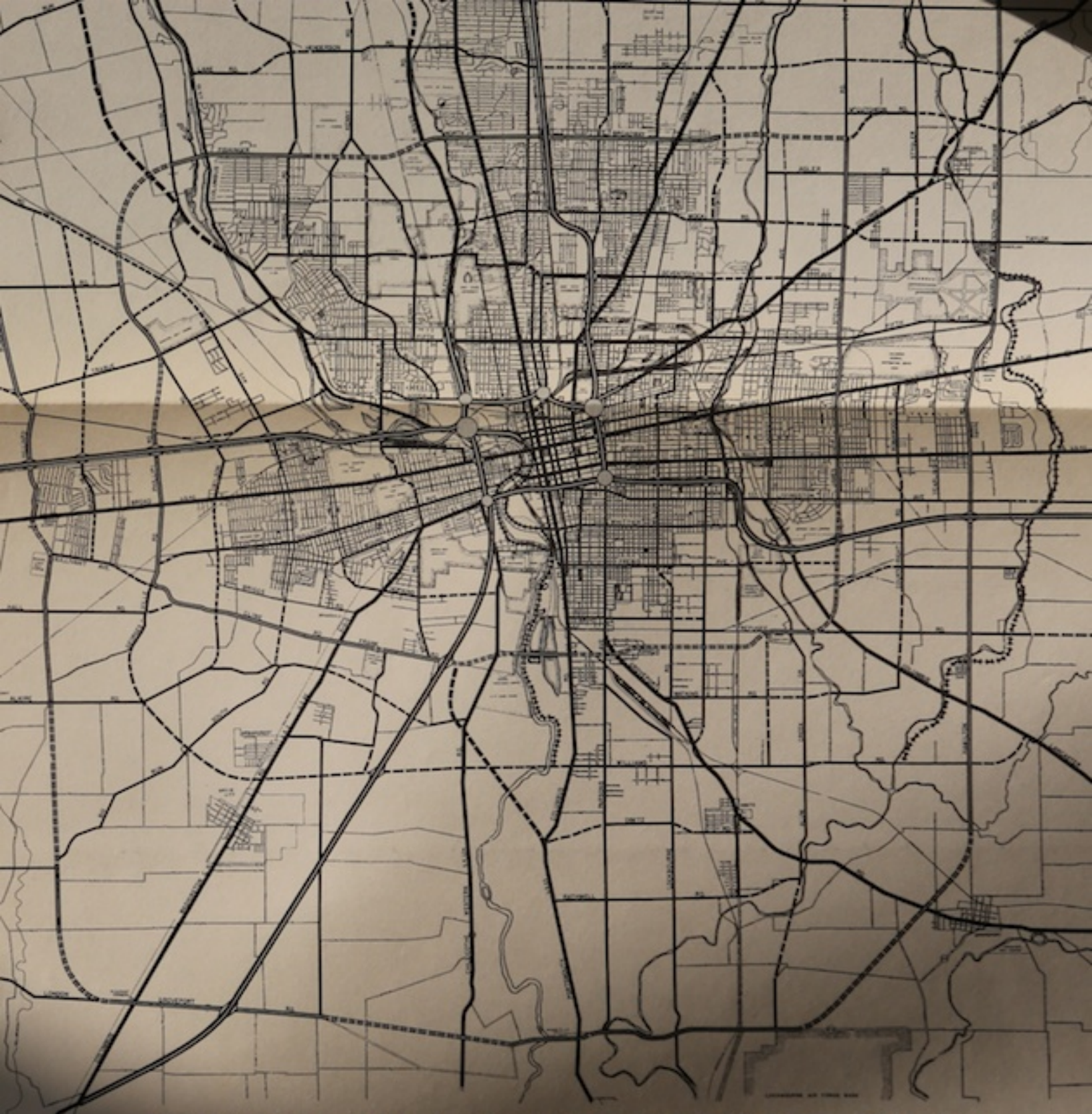
The location, general character and extent of the various streets and highways, together with recommended connections and extensions, which comprise the proposed major street plan are shown on Plate 6. This map indicates also whether the thoroughfare consists of an existing route, an extension of an existing street, a connection between existing streets or a new location. The expressways, belt or circumferential routes, and other types of major streets are separately delineated.

The Expressway System

The expressway system, now under initial construction at the Sandusky-Spring Street interchange is a dominant portion of the major street plan. This consists basically of an inner belt generally surrounding the central business district and four radiating freeways. The inner belt has two basic and all important functions, namely--(1) it serves as a by pass for traffic which has neither destination nor origin within the congested downtown district and (2) it provides a distributer for those vehicles which do enter and leave the district over the various feeder streets. The importance of many connections between the express belt line and the local service streets cannot be overemphasized.

The north freeway connects to the inner belt near Fort Hayes and serves as a new route to and from downtown Columbus for the heavy traffic generated within the densely populated areas to the north and northeast. It will also make available a direct connection to the projected toll highway between Cincinnati and Cleveland which is now expected to pass to the north and west of the city. The freeway route is proposed to skirt the edge of the Ohio State Fairgrounds, as shown on Plate 6, to a point near the Pennsylvania Railroad in the vicinity of Hudson Street, thereafter proceeding along the east side of the railroad and almost directly northward from Morse Road. Ingress and egress would be possible at most of the crossings of major streets, thereby enabling tributary local traffic to utilize the route.

The west freeway connects to the inner belt at Sandusky Street interchange and serves the existing and potential residential and industrial areas south and west of the Scioto River. However, instead of following the New York Central through the lower edge of Valleyview, joining West Broad Street just west of the city, it is proposed that the west freeway be located immediately to the north of the Pennsylvania Railroad for a distance well beyond the urban



PROPOSED MAJOR STREET PLAN

LEGEND

EXISTING ALIGNMENT		PROPOSED ALIGNMENT
	EXPRESSWAY	
	INTERMEDIATE LOOP AND OUTER BELT	
	SIX-LANE MAJOR STREET (100' R-OF-W)	
	FOUR-LANE MAJOR STREET (80' R-OF-W)	
	SECONDARY STREET	
	PARKWAY	
	MAJOR INTERCHANGE INNER LOOP	
	OTHER EXPRESSWAY INTERCHANGES	

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area before connecting to U.S. 40. This will have the advantage of avoiding Lincoln Village and other developments along West Broad Street where it would be difficult and costly to construct a thoroughfare with limited access and will enable Broad Street to continue as a major radial route to and from the west. In addition to accommodating considerable volumes of local traffic, the suggested new location also would make available a freeway connector to the projected turnpike which is expected to be located to the west of Columbus. Access connections in the vicinity of Lincoln Village and at a number of other major street crossings will permit the use of this artery by the tributary local developments in a large section of the urban area.

The east freeway will serve a large residential area to the east, intercepting U.S. routes 40 and 33 near Big Walnut Creek and south of Berwick respectively. Connection to the inner belt is made at the Fulton Street interchange.

The southwest freeway serves as a connection between the inner belt and the Interstate Highway U.S. 62 from the southwest. Instead of joining the latter in the vicinity of Frank Road, however, as originally contemplated, a location is proposed near the center of the area between U.S. 62 and State Route 104, eventually connecting with U.S. 62 north of Harrisburg where the projected Interstate freeway ends. This will make possible a continuous freeway on into the city, bypassing Grove City, Urbancrest and other development along the existing highways. The southwest freeway will of course, provide traffic relief for both the present U.S. 62 radial and Chillicothe Western Road (State Route 104). As shown on Plate 6, a connection is proposed between this expressway and U.S. 23 south of the city. This will enable traffic to and from the south, particularly trucks, to get onto the expressway system before entering the city, thereby relieving High Street of this traffic.

The Olentangy freeway extends for only a comparatively short distance and is intended to provide better alignment and freedom from the development now abutting Olentangy River Road south of King Avenue. The new freeway alignment will increase the capacity of this thoroughfare to serve the north and northwest sector of the Columbus urban area.

When completed, the expressway system will be able to handle a substantial part of the traffic now contributing to the present vehicular loads on Broad, High, and other major streets. Because of the necessarily long-range development of the system, however, traffic will be continually increasing in all parts of the community during the construction

period, and other major street improvements will be needed. In order to permit maximum utilization of freeways and of the inner belt in particular, it will be necessary to have adequate connections of this expressway to the downtown streets which will feed traffic into it. This can be accomplished through a series of ramps which should be designed to provide the best means of egress from and ingress to the expressway while preserving the surface capacity to accommodate local movements. In order to bring about an adequate pattern of traffic distribution and to equalize the load on the feeder streets, it is essential that a number of points be provided where interchange can be made.

Circumferential and By-Pass Routes

As previously noted, one of the main sources of traffic congestion in downtown Columbus is the forcing of through traffic into this district due to the lack of satisfactory cross-town and by-pass routes. The proposed expressway inner belt should relieve much of this condition downtown, but additional circumferential or by-pass arteries are needed farther out.

An intermediate loop is proposed at some distance from the inner belt. This would utilize on the north, Fishinger Avenue and its extension, Broadway and an extension to McCutcheon Road; on the east, Stelzer and James Roads and their extension southward to Refugee Road; on the south, Refugee Road, a new route paralleling the N. & W. right-of-way westward to Frank Road (connected across State Highway 104), and Clime Road; and on the west, Phillipi and Wilson Roads connected and extended to Fishinger Road. A 125 foot right-of-way to accommodate six traffic lanes is proposed for this loop. When completed this would become one of the most important thoroughfares in the city, providing a more or less direct connection between large residential areas and the major industrial centers in the east, west and south. Since this route would provide access to all the radial thoroughfares, it should be designed for interchange with the various proposed freeways.

An outer belt is proposed at the edge of or beyond the future urban area, which would permit the complete by-passing of metropolitan Columbus. This route follows Beecham, Gahanna Southern and Hamilton Roads on the east; a direct connection to State Route 665 in the vicinity of Lockbourne Air Force Base and Route 665 on the south; Neff, Norton, Hilliard-Rome and Avery Roads on the west, by-passing the villages of New Rome and Hilliard; and State Highway 161 on the north. However,

because of the difficulty of securing an adequate right-of-way along State Route 161 through the Worthington area, it is proposed to reroute a part of this highway on Wilson Bridge Road connecting with the present route east of Dublin and west of Cleveland Avenue. With the exception of Wilson Bridge Road, this route is practically the same as that now shown on the Official Thoroughfare Plan adopted by the city and county in 1944. In addition to by-passing the entire urban area, the outer belt would make available a direct route between Lockbourne Air Base and Port Columbus which has been sought by the army and airport officials. It should have a right-of-way width not less than 125 feet, and preferably 150 feet.

Radial Routes

As previously mentioned, Columbus has a number of well located radial thoroughfares, but many of these are not adequate to carry their share of the city's traffic. While completion of the expressway system will relieve some of these routes, it will be necessary to develop additional capacity within the next ten to twenty years if they are to accommodate the expected traffic increases. This can be accomplished in part by the elimination of parking and the most judicious application of traffic control, the development of some additional radials, and by providing additional relief through development of various circumferential and crosstown streets designed to attract from these arteries the more indirect, partly crosstown travel.

Radial thoroughfares on the proposed plan fall into two categories: (1) the more important, dominant arteries which must ultimately be developed with six moving lanes, and (2) radials on which four moving lanes will be sufficient. The dominant radial streets should have a right-of-way of at least 100, and preferably 110 feet to be designed essentially as indicated on Plate 1, discussed previously. Dominant radials shown on the major street plan include:

(1) North High Street, the most important thoroughfare serving the populous sections of the community lying between the Olentangy River and the New York Central Railroad.

(2) Cleveland Avenue - State Route 3, serving the large existing and potential residential districts in the north northeast.

(3) Columbus-Millersburg Road (U.S. 62), the principal route serving the large potential residential sector in the northeast.

(4 & 5) East Broad Street and Main Street, the two most important arteries to and from east Columbus, Bexley and Whitehall.

(6) U.S. 33 from the southeast.

(7) Groveport Road - Parsons Avenue.

(8) South High Street.

(9) U.S. 62 the most important route to and from the southwest.

(10) West Broad Street, now serving as the west approach of U.S. 40.

(11) Dublin Road (U.S. 33), serving parts of Grandview Heights, Upper Arlington and other areas to the northwest.

(12) Olentangy River Road, serving the large potential urban area to the north and northwest.

All of the dominant radials, except parts of Olentangy River Road and U.S. 62 west of Gahanna follow the alignment of existing routes. In order to secure a more adequate right-of-way and freedom from access of abutting property, Olentangy River Road is proposed to be relocated north of Henderson Road, following a route generally along the Olentangy River to the existing right-of-way north of Dublin-Granville Road. U.S. 62 now follows an awkward and constricted location through the west edge of Gahanna. In order to bypass this section, it is proposed to re-route the highway immediately west of the existing cemeteries on Ridenour Road, rejoining the present location of U.S. 62 opposite McCutcheon Road.

A number of four lane radials is included in the major street plan, as shown on Plate 6. Among these are:

Redding Road and its extension.
Northwest Boulevard.
Kenny Road and its extension.
Indianola Avenue.
McGuffey Road and Karl Road.

Sunbury Road.
Livingston Avenue (east of U.S. 33)
Alum Creek Drive.
State Route 104.
Sullivant Avenue.
Dublin Road.

While most of these routes are now in existence, substantial new rights-of-way, connections or extensions will be required in some instances, particularly to the northwest. A right-of-way of at least 80 feet is desirable.

Crosstown Routes

The intermediate circumferential route will accommodate a number of important crosstown movements. However, as noted previously, good crosstown streets are almost totally lacking in Columbus and must be developed in the future if all types of communication within the urban area are to be satisfactorily provided for.

In the north end of the community Stanton Road, extended to and across Sunbury Road; Bethel Road-Rathbone Avenue-Morse Road; and Henderson-Cooke Roads would serve the general area lying between the intermediate and outer circumferentials. Because of the difficulty of securing an adequate right-of-way west of Rathbond, it is proposed to use Rathbone and Leland Avenues one way between High Street and the Olentangy River. A new river crossing would be necessary at the Olentangy along with a connection to Bethel Road and ultimately a new bridge across the Scioto to connect Bethel and Hayden Run Roads. Cooke Road is now rather tightly developed west of Indianola Avenue; a more adequate right-of-way could be obtained, as shown, along Overbrook Drive connecting to Cooke Road again east of Karl. This would have the additional advantage of opening up for future development the rear portions of the deep lots now facing the south side of Cooke Road west of Karl. Extension of Cooke Road eastward and of Henderson Road to connect with Lane would make available a continuous route between the Scioto River and U.S. 62.

Between the intermediate circumferential and the north leg of the inner belt, three crosstown arteries are proposed. These are: (1) Hudson Avenue, extended west across the river to Olentangy River Road and connected eastward to Mock Road; (2) 17th Avenue and Lane Avenue, extended and connected between Port Columbus and Dublin Road; and (3)

Fifth Avenue between Hamilton Road and Dublin Road. The latter is now the only existing continuous route across the city north of Broad Street, although it is completely inadequate in width to carry the traffic load. Both Fifth and 17th Avenues should be improved to accommodate three moving lanes in each direction.

In the east and south sections of the urban area, a number of crosstowns is proposed, both in north-south and east-west directions. Among these are Cassady Avenue-Francis Avenue; Fairwood Avenue; Wilson Avenue-Lockbourne Road; Whittier Street; Frebis Avenue; Marion Road; and Watkins Road extended and connected across U.S. 33 to an extension of Robinson Avenue-Courtright Road. The latter would provide a continuous route between the south and east sections of the community. It is also proposed to develop a more adequate artery at the edge of the central business district by connecting Grant across Beck and Sycamore Streets to Jaeger, which would extend south to Frebis Avenue. Another thoroughfare which would ultimately have considerable importance south of the city is Williams Road. This is almost two miles beyond the south leg of the intermediate loop and its extension across the Scioto would connect the south and southwest sectors at the edge of the future urban area as well as provide a connection from these districts to the industrial center in West Columbus. It should have a right-of-way of at least 80 feet.

Several crosstowns are proposed in the west sector of the urban area. Communication between West Columbus and the Grandview Heights-Upper Arlington section is now most circuitous and difficult. To remedy this -- at least in part -- Central Avenue should be connected to Shultz Avenue and then Grandview Avenue through the edges of the State Institute and State Hospital on West Broad, and Fisher Road should ultimately be extended across the Scioto and the adjoining fills to meet Dublin Road in the vicinity of lower Marble Cliff. A semi-circumferential is proposed to connect West Broad Street with State Route 104, using Wheatland and Highland Avenues one way between Broad and Mound Streets, then an extension to Eakin Road, Hopkins Avenue and its extension eastward to State Route 104. Other crosstowns to the west are Hague-Wiltshire Avenues and Wilson Road and their extension. Wiltshire Avenue would be connected to Hague north of Still Avenue and in the vicinity of Briggs Road in order to utilize Hague and Wiltshire as one way streets through the developed portions of the city, thereby obviating the necessity for right-of-way widening.

A number of secondary thoroughfares is also shown on the proposed plan. These are generally streets of somewhat limited width which carry substantial local traffic and supplement the other more important major routes. A right-of-way of at least 66 feet to accommodate four moving traffic lanes would be desirable.

Traffic Control

It is not within the province of the present study to investigate the location and timing of traffic signals, specific turning movements, channelization and other details of traffic regulation and control. However, the skillful application of traffic control devices and traffic engineering in general have a considerable influence on the capacities of particular streets and indirectly, at least, on the Major Street Plan. Observation of existing traffic conditions in Columbus indicates that present traffic control leaves much to be desired. For example, left turning movements at alleys or entrances between blocks in parts of the central business district impede other traffic and discourage many drivers from using the central lanes, and the alleys are frequently used as traffic ways. Synchronization of traffic signals for progressive movement could be improved and is necessary to increase the capacity of main arteries like High, Third, Fourth and Broad Streets downtown. It is not possible to travel over these arteries now without stopping, even at off peak periods, at almost every intersection, which decreases the traffic carrying capacity of each of these streets. Consideration should be given to the elimination of parking - at least during peak hours - on all major streets where necessary to accommodate additional traffic.

CARRYING OUT THE MAJOR STREET PLAN

The major street plan shown on Plate 6 is necessarily a long-range plan to be gradually developed over the next twenty-five to thirty years. It involves improvement of existing streets as well as new street connections, extensions and in some instances entirely new rights-of-way. The widening of existing thoroughfares and street connections through built up property are usually quite expensive, but, as shown on the plan, these are desiderata in certain areas to effect any substantial improvement in traffic circulation, and, as pointed out below, future street widening can be facilitated by administration of regulations governing building set-back lines as well as by subdivision control. In any event, the acquisition or preservation of property for street widening, the extension of existing routes, and street connections or new streets should be accomplished as soon as practicable. The customary methods for acquiring such property include:

Dedication Obtained Through Subdivision Control

The cheapest and easiest method of acquiring the necessary rights-of-way for major streets, their widening or extension. lies in the dedication of property for this purpose in connection with land subdivision. Acquisition of rights-of-way up to at least 100 feet in width can be acquired at no cost to the public and without seriously handicapping the developer and where additional width may be desirable in the future, this can be provided for by increasing the building set back line to take the ultimate width into consideration. Many developers in Columbus and Franklin County have shown a willingness to provide for these future streets by dedicating additional rights-of-way or strips for highway widening, as noted in the section on existing street widths. The present city and county subdivision regulations require such thoroughfare dedications in accordance with the official thoroughfare plan before approval of the plat is given.

Acquisition of Right-of-Way by Purchase

Where needed right-of-way cannot be acquired through dedication, as in actual or imment land subdivision, it will be necessary to purchase the property from public funds. Where the terms of sale cannot be satisfactorily negotiated, it may be necessary to institute condemnation proceedings. In any event, it would be most desirable to have a special fund available for acquiring rights-of-way ahead of development,particularly in cases where development of a needed parcel is about to take place.

Where right-of-way for limited access routes is to be acquired, as in the expressways and in portions where practicable of the proposed intermediate and outerbelts, it may be necessary to purchase the property since the advantage to abutting property under these conditions is negligible and dedication, therefore, not to be expected.

Building Set-back Lines

There are two commonly used methods for deferring the acquisition of street right-of-way until the actual construction of the new or widened artery. This has been done in some states including Ohio, by establishing building set-back lines under the zoning power. By this means, new buildings or other structures and additions to buildings are prohibited from encroaching on the desired street right-of-way. Existing structures, however, or portions thereof affected by the street improvement would have to be acquired at the time construction was undertaken.

Another and generally preferable method of protecting the future street right-of-way until the property is actually needed is through the platting of mapped streets on an "official" map. This procedure involves the adoption by the community of an official map showing all existing streets and all street widenings, extensions and new streets embraced in the official major street plan. After adoption of the official map no building may be erected within the bed of any mapped street, including street extensions and connections. Provision is made, however, in special cases, where prohibition of building can be clearly proven to result in unreasonable hardship to the property owner, for modification of the requirement in keeping with the public interest and the amelioration of such hardship. Where confiscation or near confiscation of the property would result, public acquisition by purchase should be made, and a special fund, as noted above, would be most useful for effecting the purchase of the land without the added improvement cost.

Establishment of an official map or adoption of building set-back lines to protect the future street rights-of-way in accordance with the major street plan should be carried out in Columbus and the rest of Franklin County as soon as this plan has been officially approved and adopted. This procedure in combination with subdivision control is the cheapest and easiest means of protecting desirable future traffic routes without excessive building costs and without immediate purchase of such land from the much too limited pub[illegible] funds.

PARKING

It is only in the last decade or two that parking has been recognized as an important element in the solution of the over-all transportation and traffic problem. Traffic movement and circulation, the loading or unloading of commercial vehicles, and the parking of passenger cars are all interrelated and proper provision for each is needed if they are not to interfere with one another. The primary purpose of the major streets described in the foregoing is the movement of traffic, and parking should be permitted on such streets only when it does not interfere with traffic. Consequently, curb parking prohibitions and regulations are necessary to expedite traffic flow and to make the maximum use of available street pavement with parking areas and parking garages becoming more and more needed to supply off-street space.

From the standpoint of immediate need, provision of additional parking facilities is most urgent in the central business district. This is a matter of serious concern to customers, downtown business establishments, property owners and public officials, all of whom are individually affected. With the over-all increase of 100 percent or more to be expected in traffic volumes in the Columbus area within the next twenty to thirty years, as discussed in the section on major streets, it is evident that considerable improvement will be required not only to move this traffic but also to accommodate parking and storage.

Another facet of the over-all transportation problem and one of particular importance to the alleviation of traffic congestion within the central business district is wider use of mass transportation - trolley coaches and buses. Greater patronage of the transit system would mean a decrease in the total volume of traffic movement, and a concomitant reduction in the requirements for off-street parking. While many individuals desire to drive their own cars, it is obviously impossible to accommodate the traffic volumes and parking which would result if everyone in Columbus were to drive downtown. It should be recognized, therefore, that transit and the private automobile are complementary means of transportation.

General Standards and Requirements for Parking

While garages and lots for off-street parking have been established for twenty to thirty years in some communities, there are as yet rather limited experience and no widely accepted standards on which to base actual parking requirements for the different types and kinds of land uses and community activities. However, experience has shown that

and that there are several different types of parking to be provided for and that there is a limit to the distance which most parkers of the different types will walk between parking location and final destination. Observation of local parking characteristics with respect to the amount and duration of parking, utilization of existing parking spaces and areas, and even, where possible, of individual desires, is essential to determination of potential needs and requirements.

Types of parkers may be classified generally in one of three categories: (1) short time or errand, requiring normally a half-hour or less and never more than an hour; (2) shoppers and patrons, needing usually from two to three hours; and (3) employee or all day parkers. Because of the brief period required to perform some errand or to make a few purchases, convenience is a major consideration with the short time parker and curb space is most desired. Since such spaces are necessarily limited and will tend to decrease with further curb parking restrictions to handle the increased traffic, it will be necessary to bring about through appropriate regulations, the greatest utilization of curb spaces in the future, as well as to supplement such spaces with convenient off-street facilities. Shoppers and patrons also desire parking locations convenient to the stores or offices where they intend to go; however, off-street locations, if well spaced and reasonably priced, will be best able to meet the requirement of this group. All day parkers should not be encouraged to occupy space which is needed for the convenience of customers and shoppers in the central business district. While they naturally seek convenience also, employees will usually walk a considerable distance, if necessary, and areas for all day parking should be placed at the edge of the business district.

The location of parking facilities should be determined on the basis of property values, relation to the street system and arrangement of the business district. Land within the core of the district is generally too valuable for other than multiple-floor parking garages and many parking lots and garages will have to be located just outside the high value section. Customer parking should be located not more than two blocks, and preferably not more than one and a half blocks, from the major shopping areas. Facilities for all day parking, however, can be located three or four blocks or more from the business core.

TRANSIT

As stated previously, mass transportation is an important element in the over-all transportation pattern. Prior to the advent of the automobile, the location of transit lines was a major factor in setting the pattern of growth of American cities, and even though widespread ownership and use of the automobile have reduced the reliance on transit facilities, public mass transportation is still an important consideration in many districts of the city. Because of its importance as an essential public service and because of its necessarily monopolistic character (competitive lines serving the same area are generally wasteful and inefficient), transit facilities are subject to public regulations.

Mass transportation is by far the most efficient means of transporting large numbers of people within the urban community. It is becoming increasingly more obvious that the larger cities can never hope to solve the problem of the private automobile in their most congested districts, particularly within the central business district, so long as more and more people insist on using private transportation--at an average of one or two persons per car. Space is needed for parking as well as operating each vehicle, and there just is not enough space to accommodate all these cars if any room is to be left for the stores, shops, offices and other buildings which generate the traffic.

It is imperative, therefore, in order to make the most effective use of existing streets and the proposed improvements in the thoroughfare system that some way be found to make mass transportation more attractive. Ironically enough, however, the recent history of transit operations in Columbus, as in other cities, has been that as riding habit declines, per capita operating costs increase, fares must be raised, and the transit lines become even less attractive.

Due to the time limitations imposed, it is not possible to make an exhaustive study of transit operations within the Columbus area or to prepare a complete transit plan to serve the future community. This section of the report, therefore, is confined to an examination of present transit routes and data concerning utilization and service along existing lines, particularly as these relate to general land uses and the urban redevelopment program. A more complete study should be made later and a plan prepared for a system of mass transportation facilities which will adequately serve the entire future urban area.

Principles of a Modern Transit System

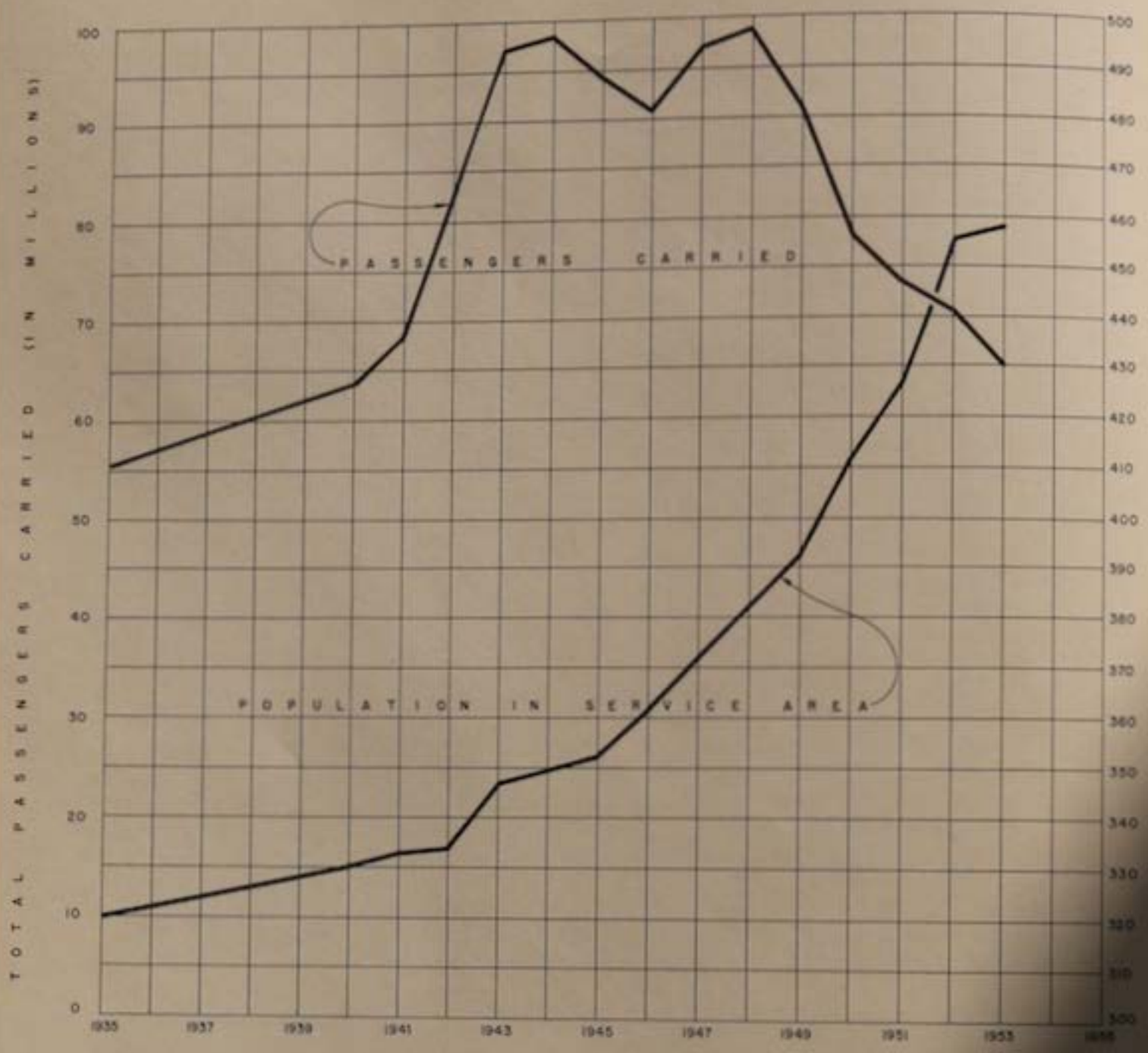
Past experience in transit operation in American cities has established certain basic standards for local mass transportation facilities. These principles should be applied to the entire transit system to meet all community needs. The major characteristics of a good transit system are economy and efficiency of operation, convenient and attractive service, and adaptability or flexibility of routes.

Economy and efficiency of operation depend on the cost of providing service to particular areas as well as on efficient operation and management. Operating costs must be low enough to attract sufficient patronage to make the system financially successful. The public is inherently opposed to an increase in fares and the number of passengers tends to decrease with each raise in fares. Economy and efficiency are fostered also by unified operation of all transit facilities under a single company, which eliminates wasteful competitive routes and permits greater coordination of routes and service throughout the community. Fortunately, practically all local transit service in the Columbus area is now under one control.

There should be a transit line within one quarter mile of all residential areas in Columbus and in those parts of the urban area where population densities warrant service. (Normally, service is warranted only in areas having a gross population density of five persons or more per acre and even here must be closely adjusted to riding habits.) As transit routes approach the central business district, they naturally tend to converge, several lines often operating on the same street. This is desirable since the central districts are of high density and especially good service is required to attract short ride passengers.

Transit routes should be located on major streets and should lead directly from residential sections to the central business district and to other major employment areas. Feeder lines requiring transfer should be avoided. Routes should proceed through the center of the business district rather than loop to reduce the necessity for transfer of crosstown passengers and to keep turning movements to a minimum.

While they are largely matters of operating detail, speed, headways and general attractiveness of facilities influence transit riding. The average speed will depend on directness of routing, routing on major streets, avoidance whenever possible of turning movements and elimination of unnecessary stops. It will be increased by the general improvement of traffic conditions heretofore proposed. The interval between coaches or buses in general should not exceed twenty minutes and more frequent service is desirable.



TREND IN TRANSIT RIDING

COLUMBUS, OHIO

CITY PLANNING COMMISSION

FRANKLIN COUNTY
REGIONAL PLANNING COMMISSION

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PLATE 9

Table 1

TRANSIT PASSENGER VOLUME TRENDS
COLUMBUS TRANSIT COMPANY

Columbus, Ohio

Year	Total Passengers	Riding Habit
1935	55,050,515	172
1940	63,304,419	194
1941	67,948,136	204
1942	82,262,154	243
1943	97,275,631	280
1944	98,144,561	281
1945	94,388,283	268
1946	90,787,182	251
1947	97,384,205	262
1948	98,881,191	259
1949	91,010,964	232
1950	77,783,170	189
1951	73,110,444	171
1952	70,336,467	158
1953	64,999,576	142

Types of transit vehicles have been undergoing a transition during the past two decades, streetcars having been replaced in many cities by the trolley coach and the latter giving place to the motor bus. The compact pattern of the Columbus area is well suited to the present combination of trolley coaches and motor buses. Trolley coaches are well adapted for service within the more densely populated sections of the city and the motor bus for service within the less dense outlying districts. The motor bus is flexible in routing and can be readily extended or rerouted to make desirable changes in service. Motor buses are also adaptable for providing express service which is usually popular with the riders even if it requires a premium fare.

Present Transit Operations

While several motor bus companies now provide limited or special transit service within the Columbus urban area, practically all of the regular service is operated by the Columbus Transit Company. The city is presently engaged in the drafting of a new transit franchise which will retain control of all facilities within the corporate limits of Columbus in the hands of a single operating company.

Most of the special or limited routes in the Columbus area are operated by the Columbus Celina Coach Company which provides service to Lockbourne Air Base, the Columbus Zoo, Grove City and the General Motors plant on West Broad Street. This company also operates the Northwest Boulevard-Arlington route which provides regular service between the central business district and parts of Grandview Heights and Upper Arlington. The Scioto and Greenlawn Bus Company operates limited local service between downtown Columbus, Valleyview and Hilliard.

Trends in Transit Riding

Table 1 shows the total number of passengers carried annually by the Columbus Transit Company in 1935 and from 1940 through 1953. This table shows also the riding habit, or ratio of total annual passengers to the population of the general area served by the transit system. Plate 9 is a graphic presentation of these trends.

The total passengers carried increased steadily during the early years of World War II, reaching a peak of more than 98,000,000 in 1944. This markedly increased riding habit was characteristic of all large American cities during the war, due to gasoline rationing and the scarcity of new automobiles. Transit riding continued at a fairly high level

for the next four or five years, until new car production began to exceed the rate of replacement of outmoded automobiles. In 1950, however, a substantial drop in passengers occurred, due in large part to the increase in fares which went into effect at that time, and since 1950 the number of passengers has declined annually at the rate of several million per year, the decrease in 1953 amounting to more than 5,000,000.

As shown on Plate 9, transit riding generally paralleled the growth of population following the depression of the 1930's and increased much more rapidly than the population during the early years of World War II. From 1944 on, however, riding habit has been on the decline, and since 1948, the trend in total transit passengers has been exactly the opposite of the population growth, declining markedly each year in the face of an ever swelling population.

These conditions indicate the importance of using every possible means to improve the attractiveness of mass transportation in Columbus. It is obvious why the city's traffic and parking problems are becoming steadily more acute--a greater proportion of the total population is using the private automobile each year. Public officials, the transit company, businessmen and citizens are all vitally concerned and every effort should be made to provide service so convenient, expeditious and generally attractive that recent trends can be reversed.

Existing Transit Facilities

The routes followed by existing transit lines are shown on Plate 10. All of these routes are operated by the Columbus Transit Company with the exception of the Northwest Boulevard-Arlington route operated by the Columbus Celina Coach Company. Separate designations are used to differentiate between trolley coach and gasoline bus operations as well as the numerous feeder lines. The routes to and from Grove City, Lockbourne, General Motors and the Columbus Zoo, which are operated on half-hour, hour or special schedules and provide only limited service, have not be shown on this map.

Eight of the routes operated by the Columbus Transit Company are trolley coach lines; the other sixteen routes (including Northwest Boulevard-Arlington) use motor buses. The trolley coach lines and six of the motor bus routes provide service to or through the central business district. The other ten motor bus lines, however, provide only feeder service to or across the main routes, thereby requiring transfer to the latter.

EXISTING TRANSIT ROUTES
AND AREA SERVED

LEGEND

- TROLLEY COACH
- MOTOR BUS
- MOTOR BUS FEEDER LINE
- ¼ MILE SERVICE AREA

ONE DOT REPRESENTS 50 PERSONS OF 1954 POPULATION

CITY PLANNING COMMISSION

FRANKLIN COUNTY
REGIONAL PLANNING COMMISSION

HARLAND BARTHOLOMEW AND A
CITY PLANNERS

SAINT LOUIS


KEY
MOTOR BUS
TROLLEY COACH


REA
KEY
MOTOR BUS
TROLLEY COACH

so as to serve the
or secondary thoroughfares.
desirable to minimize the necessity of
travel.

of the motor bus lines, however, are located only
service, requiring transfer to the main routes.
n, several of the feeder lines consist of large
ch are indirect and inconvenient, requiring some
s to travel substantial extra distances to avoid
s. This is particularly true of the Oakland Park-
d and Bexley Crosstown lines. The Worthington,
d and Livingston feeders are in effect extensions
ing trolley coach lines. Trolley coach routes are
y direct and well located but a number of the motor
tes, including the Hudson Street and Bexley Crosstown
n particular, is quite circuitous and indirect in rout-
arts of the motor bus routes also are located on minor
s, which is not in conformity with good street or resi-
l planning, although sometimes necessitated by the
ng street pattern until adequate major or secondary
ts are available.

While duplication of service on radial routes as they
erge downtown is unavoidable and, in fact, desirable to
ide better service and encourage riding in these close-in
s, duplication of service in other parts of the community
enerally unnecessary and inefficient. The looping,
cuity and indirectness of the several motor bus lines
the vicinity of Hudson Street, Weber Road, Hamilton
nue and Cleveland in north Columbus result in the most
ious duplication of service in the present transit system.

equacy of Service

The quarter mile service area of existing transit routes
s shown in hachure on Plate 10. Within the present city about
5,100 persons or 8.5 percent of the total population reside
ore than one quarter of a mile from a transit line. Within
the other incorporated areas adjoining Columbus, some 13,300,
or 23 percent of their population, are located beyond the

No.	Route Name												
	Trolley Coach Lines												
1	North & South High	20.02	10.01	} 373	62016	69.0	5693	42809	7.51	8	3	Nor
2	High & Whittier	10.57	9.28							8	3	Nor
3	Long & Livingston	12.48	6.33	129	22704	72.2	1751	16271	9.29	10	3.5	Ea
4	Parsons & Neil	13.59	6.86	125	22000	64.7	1661	14233	8.56	10	4.5	We
5	Broad & Mt. Vernon	15.11	7.56	195	34320	64.1	2792	22046	7.89	8.5	2.5	Ea
6	Oak Street	5.93	2.96	158	13904	69.5	1018	9680	9.50	8	3.5	Ea
7	Main & Indianola	21.73	10.90	203	35728	75.7	3921	27140	6.92	7	2.5	No
8	Cleveland & Sullivant	20.47	10.23	192	33792	68.9	3763	23313	6.19	8	3	No
	Summary				224464	69.4	20599	155492	7.54			
	Motor Bus Lines												
A	Arlington & West Mound	24.33	12.45	89	13172	52.2	2072	6875	3.31	15	5	N
B	Frebis & W. Fifth Ave.	16.86	8.73	113	16272	62.3	1987	10144	5.10	12	5	N
C	Leonard & E. 5th Ave.	16.54	8.27	132	10824	79.5	1874	8612	4.59	10	5	E
D	Fifth Ave.	4.50	2.30	97	5238	58.7	460	3069	6.67	15	8	E
E	Hamilton Avenue	15.85	7.92	62	5560	66.5	1112	3713	3.33	20	10	
F	East Broad Street	15.02	7.51	64	5760	74.0	913	4265	4.67	20	5	
G	Hudson Street	7.73	3.86	62	3348	48.6	489	1629	3.32	20	11	
H	Ohio Avenue	6.73	3.55	50	2700	70.0	349	1889	5.41	20	20	
I	Worthington	7.03	3.61	31	1674	36.7	242	615	2.54	30	30	
J	Eastgate	2.21	1.10	74	1998	5.2	174	103	0.59	15	15	
K	Oakland Park-Weber Rd.	5.04	2.52	94	2914	27.8	568	813	1.43	20	20	
L	Bexley Crosstown	5.51	2.86	32	1728	29.8	185	516	2.78	30	30	
M	Hague Avenue	5.34	2.76	63	3402	31.8	366	1082	2.95	15	15	
N	Beechwold	5.39	2.69	30	1620	25.2	170	408	2.40	30	30	
O	Livingston Feeder	4.26	2.13	76	4104	5.4	312	223	0.71	20	10	
	Summary				80334	54.7	11273	43954	3.89			

Source of Data: C

(a) Allows for short-trip operation
(b) Passengers and miles averaged for typical 5-day period
(c) Computed from length of line and time from Business District to ends of line (without allowance for layover)

2	High & Whittier	10.57	9.28						8	3	North-32	South-
3	Long & Livingston	12.48	6.33	129	22704	72.2	1751	16271	9.29	10	3.5	East-18	East-
4	Parsons & Neil	13.59	6.86	125	22000	64.7	1661	14233	8.56	10	4.5	West-17	South-
5	Broad & Mt. Vernon	15.11	7.56	195	34320	64.1	2792	22046	7.89	8.5	2.5	East-18	West
6	Oak Street	5.93	2.96	158	13904	69.5	1018	9680	9.50	8	3.5	East-21	
7	Main & Indianola	21.73	10.90	203	35728	75.7	3921	27140	6.92	7	2.5	North-29	East -
8	Cleveland & Sullivant	20.47	10.23	192	33792	68.9	3763	23313	6.19	8	3	North-31	West -
	Summary				224464	69.4	20599	155492	7.54			
	Motor Bus Lines											
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B	Frebis & W. Fifth Ave.	16.86	8.73	113	16272	62.3	1987	10144	5.10	12	5	North-28	South-
C	Leonard & E. 5th Ave.	16.54	8.27	132	10824	79.5	1874	8612	4.59	10	5	East -30	
D	Fifth Ave.	4.50	2.30	97	5238	58.7	460	3069	6.67	15	8	East -9	West -
E	Hamilton Avenue	15.85	7.92	62	5580	66.5	1112	3713	3.33	20	10	North-37	
F	East Broad Street	15.02	7.51	64	5760	74.0	913	4265	4.67	20	5	East 37	
G	Hudson Street	7.73	3.86	62	3348	48.6	489	1629	3.32	20	11	20	
H	Ohio Avenue	6.73	3.55	50	2700	70.0	349	1889	5.41	20	20	20	
I	Worthington	7.03	3.61	31	1674	36.7	242	615	2.54	30	30	15	
J	Eastgate	2.21	1.10	74	1998	5.2	174	103	0.59	15	15	7.5	
K	Oakland Park-Weber Rd.	5.04	2.52	94	2914	27.8	568	813	1.43	20	20	10	
L	Bexley Crosstown	5.51	2.86	32	1728	29.8	185	516	2.78	30	30	15	
M	Hague Avenue	5.34	2.76	63	3402	31.8	366	1082	2.95	15	15	15	
N	Beechwold	5.39	2.69	30	1620	25.2	170	408	2.40	30	30	15	
O	Livingston Feeder	4.26	2.13	76	4104	5.4	312	223	0.71	20	10	15	
	Summary				80334	54.7	11273	43954	3.89			

(a) Allows for short-trip operation
(b) Passengers and miles averaged for typical 5-day period
(c) Computed from length of line and time from Business District to ends of line (without allowance for layover)

Source of Data: Columbus Transit Co

May, 19

quarter-mile service area, and in the urban area as a whole about 80,700 or 15.7 percent of the total population live outside the accepted service radius. These figures are somewhat higher than those found in other communities of this size. For example, a recent transit study for the Toledo urban area indicated that 8.9 percent of the population resided outside the quarter-mile service radius, and a similar study in Dayton revealed about 11 percent of the total urban population living more than one fourth mile from a transit line. The major portions of the unserved population inside the city are to be found in east Columbus, including the large apartment development of Beverly Manor, and in the areas to the north between High Street and Indianola Avenue and along the Olentangy River. The largest residential sections unserved outside the city are located in Whitehall and in Clinton and Mifflin Townships between the city and Alum Creek.

All of the trolley coach lines provide frequent service to and from the central business district. The motor bus lines routed downtown also provide frequent service during the rush periods, but operate on 10 to 20 minute headways during the rest of the day, and the feeder service is relatively infrequent, only the Fifth Avenue, Hudson Street and Livingston feeder lines operating at faster than 15 minute intervals, even during the rush hours. The large number of feeder lines is inconvenient also due to the necessity of transfer to a main line to complete the trip.

Summary of Transit Data

Information concerning transit operations on each of the different lines in the Columbus urban area is shown in Table 2. The basic data were supplied by the Columbus Transit Company, the percent of seats occupied and average speeds being computed from the basic figures. No information was available on the Northwest Boulevard-Arlington route operated by the Columbus Celina Coach Company.

The most heavily used lines are the combined High Street routes which carry more than 40,000 passengers daily. All of the trolley coach lines are well patronized, only the relatively short Oak Street route carrying fewer than 14,000 passengers per day and this line transports nearly 10,000 per day. On the other hand, the motor bus lines carry fewer passengers, only three lines showing more than 5,000 passengers per day and six lines transporting fewer than 1,000 persons. The latter are all feeder routes, two of which--Eastgate and Livingston--were patronized by only 103 and 223 persons respectively on an average weekday.

Routing and Alignment of Existing Lines

All of the existing trolley coach lines are routed through the central business district with the exception of the Oak Street route which loops downtown and returns to its terminus at Fairwood. The North and South High and Whittier Street lines are operated virtually as a single route with split service at Whittier Street. In general, trolley coaches are located so as to serve the denser portions of the city and follow major or secondary thoroughfares. The through routing downtown is desirable to minimize the necessity of transfers for through travel.

Most of the motor bus lines, however, are located only for feeder service, requiring transfer to the main routes. In addition, several of the feeder lines consist of large loops which are indirect and inconvenient, requiring some passengers to travel substantial extra distances to avoid long walks. This is particularly true of the Oakland Park-Weber Road and Bexley Crosstown lines. The Worthington, Beechwold and Livingston feeders are in effect extensions of existing trolley coach lines. Trolley coach routes are generally direct and well located but a number of the motor bus routes, including the Hudson Street and Bexley Crosstown lines in particular, is quite circuitous and indirect in routing. Parts of the motor bus routes also are located on minor streets, which is not in conformity with good street or residential planning, although sometimes necessitated by the existing street pattern until adequate major or secondary streets are available.

While duplication of service on radial routes as they converge downtown is unavoidable and, in fact, desirable to provide better service and encourage riding in these close-in areas, duplication of service in other parts of the community is generally unnecessary and inefficient. The looping, circuity and indirectness of the several motor bus lines in the vicinity of Hudson Street, Weber Road, Hamilton Avenue and Cleveland in north Columbus result in the most obvious duplication of service in the present transit system.

Adequacy of Service

The quarter mile service area of existing transit routes is shown in hachure on Plate 10. Within the present city about 35,100 persons or 8.5 percent of the total population reside more than one quarter of a mile from a transit line. Within the other incorporated areas adjoining Columbus, some 13,300, or 23 percent of their population, are located beyond the

quarter-mile service area, and in the urban area as a whole about 80,700 or 15.7 percent of the total population live outside the accepted service radius. These figures are somewhat higher than those found in other communities of this size. For example, a recent transit study for the Toledo urban area indicated that 8.9 percent of the population resided outside the quarter-mile service radius, and a similar study in Dayton revealed about 11 percent of the total urban population living more than one fourth mile from a transit line. The major portions of the unserved population inside the city are to be found in east Columbus, including the large apartment development of Beverly Manor, and in the areas to the north between High Street and Indianola Avenue and along the Olentangy River. The largest residential sections unserved outside the city are located in Whitehall and in Clinton and Mifflin Townships between the city and Alum Creek.

All of the trolley coach lines provide frequent service to and from the central business district. The motor bus lines routed downtown also provide frequent service during the rush periods, but operate on 10 to 20 minute headways during the rest of the day, and the feeder service is relatively infrequent, only the Fifth Avenue, Hudson Street and Livingston feeder lines operating at faster than 15 minute intervals, even during the rush hours. The large number of feeder lines is inconvenient also due to the necessity of transfer to a main line to complete the trip.

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Information concerning transit operations on each of the different lines in the Columbus urban area is shown in Table 2. The basic data were supplied by the Columbus Transit Company, the percent of seats occupied and average speeds being computed from the basic figures. No information was available on the Northwest Boulevard-Arlington route operated by the Columbus Celina Coach Company.

The most heavily used lines are the combined High Street routes which carry more than 40,000 passengers daily. All of the trolley coach lines are well patronized, only the relatively short Oak Street route carrying fewer than 14,000 passengers per day and this line transports nearly 10,000 per day. On the other hand, the motor bus lines carry fewer passengers, only three lines showing more than 5,000 passengers per day and six lines transporting fewer than 1,000 persons. The latter are all feeder routes, two of which--Eastgate and Livingston--were patronized by only 103 and 223 persons respectively on an average weekday.

The number of passengers per vehicle mile operated is a more significant figure, since this provides an index to the success of each route from a financial standpoint. This figure is determined by dividing the average number of passengers carried by the total miles traveled by all vehicles operated on that route. On the basis of average operating costs per mile of route, at least four passengers per vehicle mile are required in most communities to make the operation profitable, otherwise the line is not paying its way and continued operation must be subsidized by the better patronized routes. The Columbus transit system as a whole is somewhat above average in the patronage afforded most routes, primarily because of the compact development of the city and the favorable population densities along existing lines. Trolley coach service is by far the most successful, the Long-Livingston and Oak Street routes through the relatively densely populated sections carrying more than nine passengers and the Parsons-Neil Avenue line more than 8.5 passengers per vehicle mile of operation. The trolley coaches as a whole average 7.5 passengers per vehicle mile in contrast with 3.9 passengers per mile operated by the motor buses. The latter, however, are slightly less expensive to operate.

Rather surprisingly, the largest number of passengers per vehicle mile of motor bus operation is found on a feeder route - Fifth Avenue - primarily because this line is short, and in addition to traversing a relatively populous section of the city provides transfer service to the industries along Fifth. No information is available concerning the Northwest Boulevard-Arlington line, but three of the other five main motor bus routes carry from 4 to 5 persons per mile and the other two slightly over three persons per mile. Seven of the ten feeder routes show fewer than three persons per vehicle mile, two of these--Eastgate and Livingston--transporting an average of less than one person per mile of operation. The latter routes are very costly for the service provided and the service obviously is not sufficient to overcome the disadvantage of transfer to connecting direct lines. However, considering the number of feeder bus routes which are generally poorly patronized in other communities, the average number of persons per vehicle mile of motor bus operation (3.9) is surprisingly high in Columbus.

The relation between the total passengers carried by each line and the seats furnished indicates that present service is generally adequate. While conditions vary considerably during rush periods and normal operation during the rest of the day, a ratio of 50 to 75 percent between

assengers and available seats is quite satisfactory. Trolley coaches now show an average seat occupancy ratio of 64 to 76 percent and motor buses generally a somewhat lower figure. The ratio of passengers to seats on the five main motor bus routes varies between 50 and 80 percent, but this ratio is relatively low on most of the feeder lines, averaging below 40 percent on all except the Fifth Avenue, Ohio Avenue and Hudson Street routes and below 30 percent on five of the feeder lines. Patronage of the Eastgate and Livingston feeder routes is so poor that passengers represent only 5 percent of the available seats.

The present headways are indicative of frequent service, both rush hour and normal, on all the trolley coach routes, and the main line motor bus service is also satisfactory. However, intervals between buses in excess of 20 minutes, as on some of the feeder lines, is generally unsatisfactory, although this may be justified in the case of the Worthington line by the lower population density and riding habit.

Average speeds were computed from the length of the route and the sum of the travel times from the central business district to each end of the route, no allowance being made for lay-over which would tend to reduce the average speed slightly on certain lines. Trolley coach speeds compare reasonable well with those in other cities, being about the same as the average in Dayton, for example, but motor bus service is comparatively slower, the average of all bus routes in Dayton and other cities running generally from 12 to 15 miles per hour, compared with the over-all average of about 11.5 miles per hour in Columbus. Motor bus speeds of 9 or 10 miles per hour, as on the Frebis, Fifth Avenue, Hague and Beechwood lines are particularly low. These figures emphasize the necessity for speeding up all transit service by favoring transit operations in parking and traffic control and by improving other operating conditions if mass transportation is to hold its own in the future in competition with the private automobile.

Conclusions and Recommendations

Existing trolley coach lines are well located on major or secondary thoroughfares, generally direct in routing, and traverse areas of sufficient density for relatively good patronage of these routes. However, existing motor coach lines, except for the six main lines routed to and from the central business district, are used as feeders principally for the various trolley coach routes and, in addition to requiring transfer to the latter, follow in some instances circuitous routing and minor street locations.

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Many improvements in mass transportation within the
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(1) Several trolley coach lines should be extended in
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extended eastward along Livingston Avenue to James Road
replace the existing motor bus feeder route, which is
little used due to the inconvenience of transferring.
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The Beechwold line is a feeder extension of the
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, but this will probably have to await annexation or
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Consideration should also be given to extension of the
ivant Avenue line to the west to replace that portion
he present Hague Avenue feeder.

From the standpoint of good mass transportation facilities, both the Goodale and the Market-Mohawk redevelopment areas are well served. The former adjoins the Parsons Avenue - Neil Avenue trolley coach line on its east and the Frebis - West Fifth Avenue motor bus line along its west. The latter line will require rerouting over Michigan Avenue instead of Pennsylvania Avenue between Goodale and First in order to avoid cutting through the edge of the redevelopment project. The Long-Livingston Avenue and Indianola-Main Street trolley coach lines serve the proposed Market-Mohawk redevelopment area. The Long Street-Livingston line is now routed west on Livingston and east on Fulton between Parsons and High Streets and modification of this routing will be required also in connection with redevelopment of the area and construction of the south leg of the proposed innerbelt expressway. The detailed redevelopment plan is yet to be determined for the Market-Mohawk area.

Many improvements in mass transportation within the Columbus urban area will have to await the consummation of certain proposals of the Major Street Plan. There are several minor adjustments, extensions, or eliminations of existing lines, however, which could be carried out without additional street construction. Specifically, it is suggested that the following improvements be made:

(1) Several trolley coach lines should be extended in order to provide more direct routing in the place of existing feeder service. The Long and Livingston line should be extended eastward along Livingston Avenue to James Road to replace the existing motor bus feeder route, which is now little used due to the inconvenience of transferring. This extension can be made as soon as Livingston Avenue is repaved through Bexley and East Columbus which is now contemplated.

The Beechwold line is a feeder extension of the Indianola trolley coach route terminating near Brevoort. The latter should be extended north on Indianola to replace the feeder service, thereby providing direct routing downtown from this section. The north High Street trolley coach service should also be extended northward to Worthington, but this will probably have to await annexation or incorporation of the intervening unincorporated territory.

Consideration should also be given to extension of the Sullivant Avenue line to the west to replace that portion of the present Hague Avenue feeder.

(2) As stated previously, the Frebis-Fifth Avenue line should be routed on Michigan around the Goodale redevelopment area. This would have the advantage also of making this route slightly more direct, eliminating left and right-hand turning movements at First Avenue. It would continue to serve effectively both the project area and industrial establishments.

(3) The Hudson Street line is now most circuitous and duplicates for several blocks the Hamilton Avenue route. The meandering east of Cleveland Avenue is due in part to the necessity to remain inside the Columbus corporate limits (Hudson Street east of the Pennsylvania Railroad is outside the city) and the additional operating distance is far out of proportion to the service provided. Service on this line would be more direct and less costly if it were routed only on Hudson Street, stopping at the east corporate limits until the remainder of Hudson is within the city.

(4) The Eastgate loop provides little service and is little used, with less than one passenger per vehicle mile. It should be abandoned.

(5) The Oakland Park-Weber Road line consists of a large loop with motor bus operation in both directions. Consideration should be given to abandonment of the loop routing and extension of each line to High Street which would provide some additional feeder service in the area between Indianola and High Street where transit service is now lacking, even though more direct routing rather than feeder service should ultimately be provided.

(6) The Bexley crosstown route also consists of a large irregular loop. Fares on this line are 5 cents only, with no transfer privilege, which apparently encourages local riding within the Bexley community. Simplification of the present route to reduce turning and to avoid as much as possible operation on Main Street would be desirable.