TRY OF TOWN AND COUNTRY PLANNING

Advisory Handbook on

THE REDEVELOPMENT OF CENTRAL AREAS

LONDON
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Foreword

THIS is the first of a series of handbooks which will be published by the Ministry of Town and Country Planning dealing with the technique of planning.

¶ It is felt that Local Authorities and others concerned may wish to have, in supplementation of the statutory and procedural framework provided by Acts, Regulations and Circulars, some broad indication of the views of the Ministry on how to handle the problems arising in the sphere of practical planning. The handbooks will therefore, unless some specific statement is made to the contrary in any instance, be advisory and not mandatory.

¶ The handbooks are primarily for the use of Local Authorities' Planning Officers and Consultants, but it is hoped that they will also help members of Planning Committees and others interested in planning.

¶ It is appropriate that the first handbook should deal with the Redevelopment of Central Areas, because war damage has made this a high priority. It is hoped that it will be followed by handbooks on residential and on rural areas.

¶ No doubt some of the recommendations in this handbook will need to be adapted to suit the conditions of individual towns. Some are also likely to need modification in the light of experience as the work of redevelopment proceeds. Suggestions for improvements either in later editions or in other handbooks in the series will be welcome.

Ministry of Town and Country Planning
Summer, 1947.

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Chapter 1: Introductory

I. THE SCOPE OF THE HANDBOOK

1. This advisory handbook is concerned with the more important technical problems involved in the redevelopment of central areas, and provides general guidance on the principles and standards that should govern the preparation and execution of redevelopment plans for such areas.

2. At an early stage in the preparation of the handbook it was found that the relationships between the various aspects of redevelopment—such as the main street layout, use-zoning and density of buildings—could best be examined with reference to a particular town. In addition, it was evident that some of the most difficult problems only arose in towns with a population of 250,000 or more, and after consideration of the sizes of towns severely damaged by air attack, it was decided to base the handbook's conclusions and recommendations on conditions in a provincial town of about 250,000 inhabitants. It is thought that the majority of the conclusions valid for a town of this size will apply, in an appropriately modified form, to smaller towns. Although the handbook's recommendations are broadly applicable to all towns, special attention has been given to the redevelopment of war-damaged central areas.

3. Some of the recommendations must be considered provisional, in that both the situation with which Planning Authorities have to deal, and the powers granted them for the purpose, are new. It is therefore possible that as redevelopment proceeds and practical experience is gained some recommendations may need modification. But it is believed that this need will mainly be confined to secondary matters.

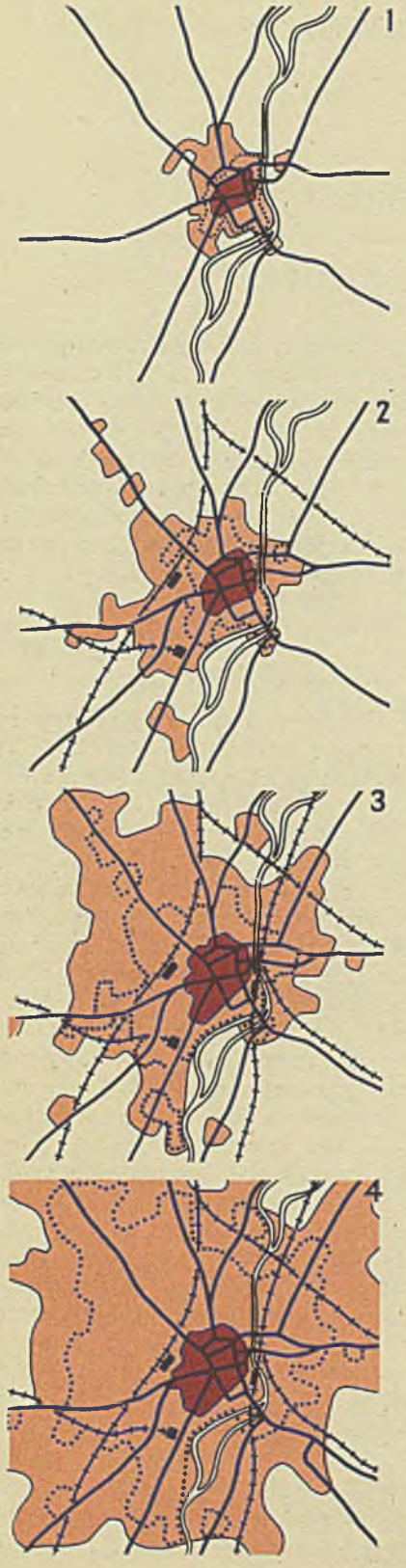
4. The phrase " central area " is used throughout the handbook in its common sense of meaning that portion of a town which contains the principal commercial streets, and usually the main public buildings. In general, it comprises the core of the town's business and civic life. If the various aspects of redevelopment are to be seen in proper relationship with each other, it is necessary for them to be considered with reference to an area which is a reasonably balanced and self-contained planning unit; and the central area, as above defined, is the most suitable planning unit against which to consider the problems of central redevelopment. Land in a central area should therefore be redeveloped in accordance with a plan covering the whole of the central area.

II. THE GROWTH OF TOWNS

5. Since the central area of a town is the chief meeting. and exchange point for the surrounding locality, the central areas of different towns have many common features. Each is, in varying degree, at the centre of a radial system of roads and is the scene of the most intense land use and highest land and rateable values within its locality; and in each, particular trades or activities tend to be grouped together within certain streets or districts. On the other hand, great differences exist between central areas in the proportions of land used for particular purposes, and in the size of the central area in relation to the total built-up area of the town.

6. This function of being the locality's major exchange point has led to the growth within every central area of a most complicated pattern of land uses, many of which are interdependent, and the relative significance of these land uses and their relationships to each other will be more easily appreciated if the main stages of their growth are kept in mind.

7. The pattern of land uses in the central areas of nearly all towns has grown up very slowly. Every town was originally located on a particular site because of some military or trading advantage, and sometimes that advantage still remains. The earliest buildings were grouped about the cross-



THE GROWTH OF A TOWN

the development of the Central Area in relation to the whole town 1740-1939

built-up area *central area*

roads, castle or other focal point of the town, and building development spread slowly along converging roads and cross-streets to form the beginnings of the familiar " spider's web " pattern of streets.

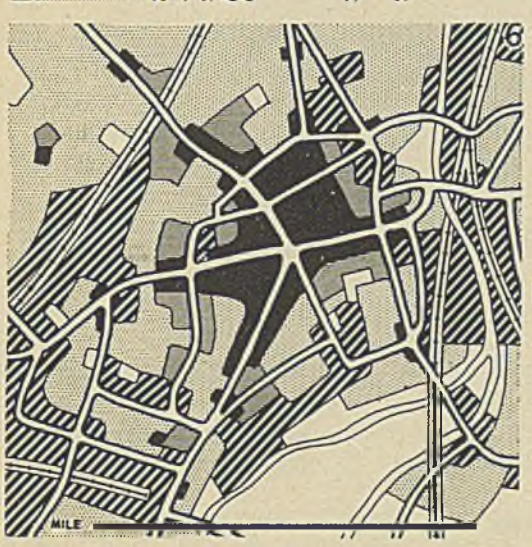
8. One aspect of the history of towns which is of special significance to those concerned with urban redevelopment, is the tendency for particular trades or callings to congregate in certain streets or parts of towns. The reasons for this tendency have varied at different periods, but it has always existed and shows that use-zoning, one of the main devices by which planning authorities must seek to guide redevelopment, is not a new adminstrative device, but rather an organized way of doing what citizens have long tried to do by unco-ordinated efforts.

9. When once the central pattern of streets and land uses had been established in a town, the inhabitants became very chary, perhaps too chary, of large-scale changes. Streets might be improved and here and there new streets cut through, but almost without exception the broad layout of the central area remained unchanged, and new development pushed out first on one side of the central area, then on another and eventually surrounded it.

10. The growth of the average larger British town can be broadly divided into three main stages, each of which played a great part in determining the layout of land uses within the central area as it was in 1939. These three stages may be called the formative stage, the stage of rapid growth and the motor transport stage.

The Formative Stage

11. The formative stage may be taken to cover the town's growth up to 1830-40, when the road layout in the neighbourhood of the central area had become fixed and certain land uses within the area were already well-established. Fig. 1 shows that by 1840 the main road pattern of a town which then contained 30,000 inhabitants already existed in the form it was to retain up to 1939, when the population had risen to 250,000. A map of the main predominant use areas in 1840 has not been reproduced, but those predominantly used for



THE GROWTH OF A TOWN

development of predominant uses in the central area between 1880 *and* 1939

shopping

industry and railway land

business

residential

shops, warehouses and industrial buildings were in approximately the same positions, although not so large, as those shown in Fig. 5 for the year 1880.

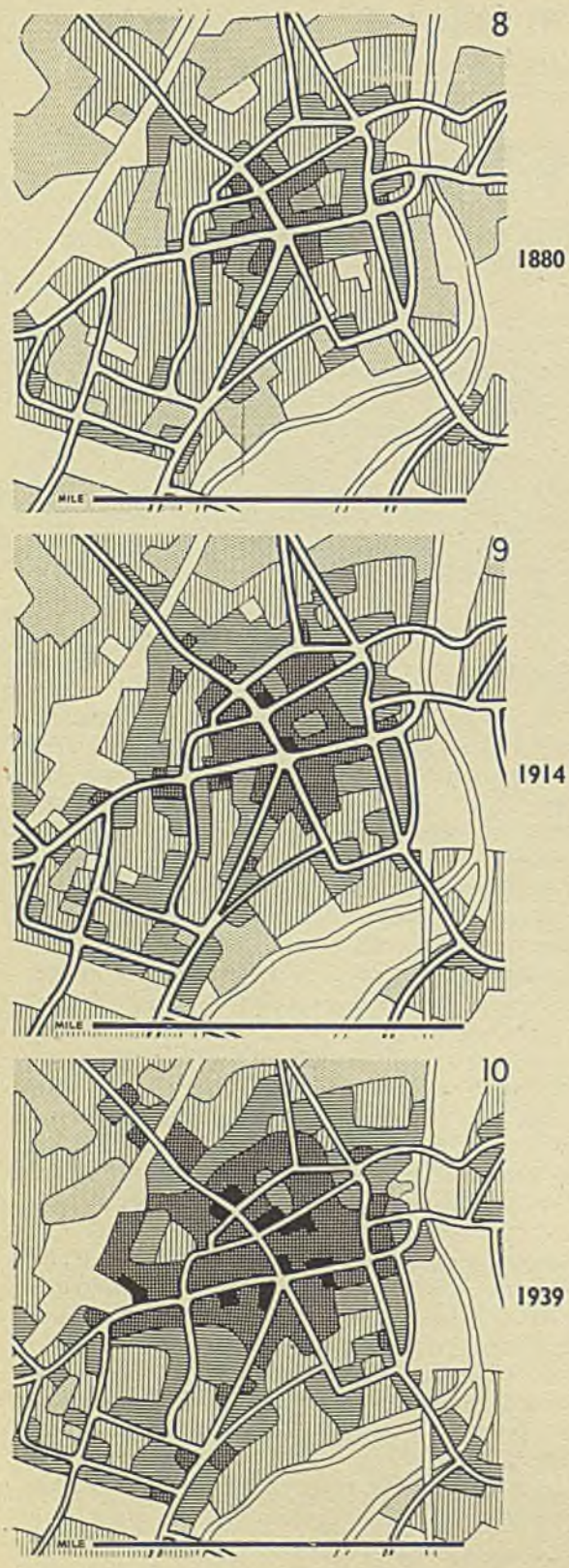
12. It may therefore be said that by 1840, and frequently much earlier, the framework of the central areas of most towns had become firmly established, and that nearly all later changes were the result of attempts to cater for a great increase in needs while avoiding any big changes in the framework.

The Stage of Rapid Growth

13. Nearly all towns which were of large size in 1939 grew greatly between 1840 and 1914. The Industrial Revolution, the general increase of population and the ease of transport resulting from the rapid spread of railways, were the main causes of this growth. During this stage, the population of the town on which the handbook's illustrations have been based increased from 30,000 to about 200,000 and the effects of this increase upon the physical development of the town is indicated in Figs. 2, 3, 5, 6, 8 and 9. Figs. 2 and 3 show the growth of the central area and the total built-up area, Figs. 5 and 6 show the growth of the areas predominantly used for certain purposes, and Figs. 8 and 9 the increase of building volume or building accommodation. The total built-up area increased greatly during this period. The central area also increased in size but not to a proportionate extent. It is probable that traders in the central area were aware of the advantages of a central position, and preferred to increase building accommodation within the central area rather than move outwards (see Figs. 8 and 9).*

14. This period of large growth did not change the relationship of the central area to the rest of the town in any important way, but led to a deterioration of living and working conditions within the central area. The expansion of the central area compelled the invasion by central

*For an explanation of the Floor Space Indices given for Figs. 8, 9, and 10 see paras. 52-58 below.



THE GROWTH OF A TOWN

increase in building accommodation in the central area between 1880 *and* 1939

floor space indices

up to .8

.8 *to* 1.2

1.2 *to* 1.6

1.6 *to* 2.0

over 2.0

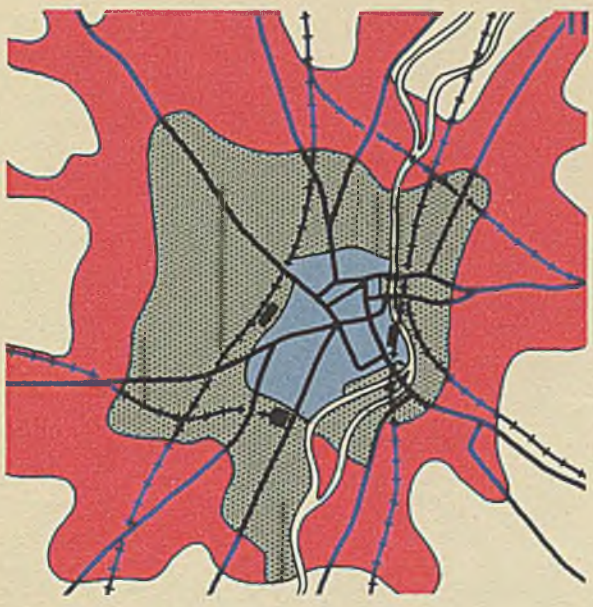
area uses of the old residential districts nearby, and finally these were either eliminated or closely interwoven with other uses. The advent of steam power led to the establishment of factories, which came within the central area as it grew and were a source of much nuisance; and the higher and more closely packed buildings had resulted by 1914 in a great increase of street traffic and appreciable congestion at particular times and places. There is, however, no great evidence that outside London this congestion was then considered likely to become a serious impediment to the full functioning of the central area. On the contrary, it appears generally to have been regarded as a healthy sign of full functioning and prosperity.

15. Some of the new suburbs that were established during this stage were self-contained as regards daily shopping facilities, but most of them were close to the central area and were served by short distance transport. Thus in 1914 the majority of the total retail trade of the town was still carried on within the central area.

The Motor Transport Stage

16. The third main stage in the growth of the average larger town was that which took place between 1920 and 1939. Between 1922 and 1939 the number of mechanically propelled vehicles in Britain increased, in round figures, from 650,000 to 2,500,000, and this rapid development of a new form of transport, together with improvements in suburban rail services, had important consequences both for towns as a whole and for their central areas.

17. The housing estates built to remedy the housing shortage and to relieve congestion in the inner areas were often located at considerable distances from the centre of the town, and the ordinary shopping needs of the inhabitants of the new estates, and later some of their special shopping needs, were met by local shops. In addition, some of the industrial firms within the town moved out to the suburbs, where land



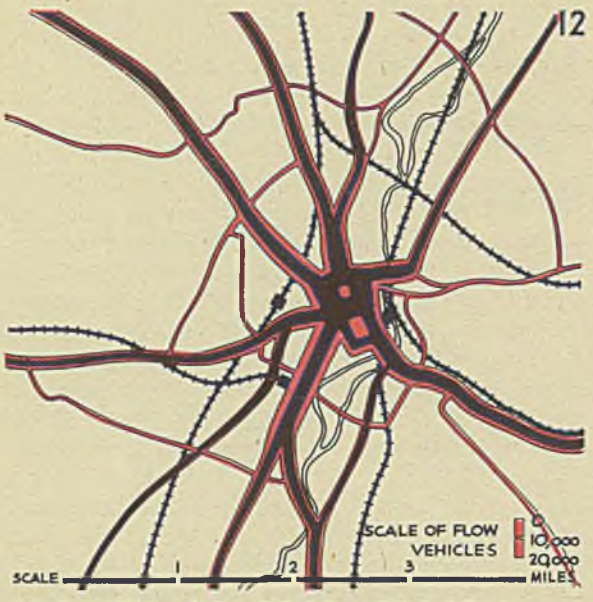
suitable for modern factories could be more cheaply acquired. Thus one result of the increase of motor traffic was a decentralizing movement that threatened to bring about a drop in business activity and demand for land in the central area and greatly enlarged the total built-up area of the town. This movement is illustrated diagrammatically in Fig. 11, which shows that between 1920 and 1939 the central area and immediately adjoining districts lost population, an intermediate ring, on balance, neither gained nor lost, and an outer ring gained a considerable increase of population.

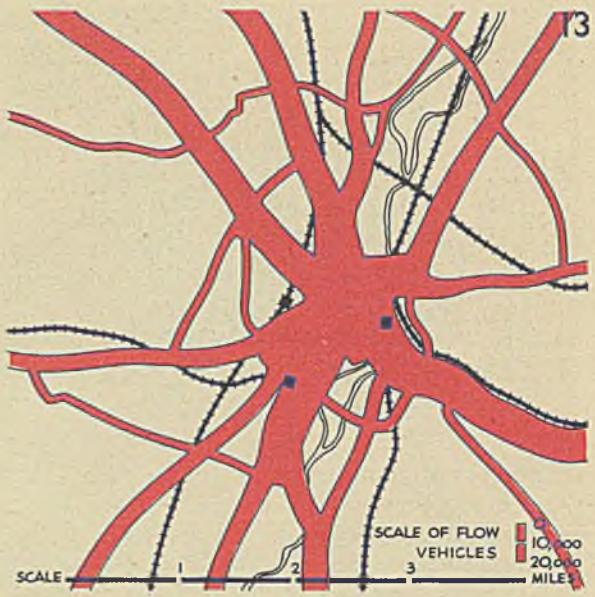
18. A second result of the increase of motor traffic had, on the other hand, an opposite effect. Motor transport greatly increased the radius of influence of the central area. In particular, people could travel much greater distances to the central area to satisfy special shopping needs and their purchases could be delivered by motor vans, and there is little doubt that this was a chief cause of the growth in the number of towns in which branches of multiple stores were established. The central area's radius of influence was, of course, also extended for business purposes and from the point of view of daily travel between home and work, and the great majority of the working population of the new housing estates on the outskirts continued to depend for employment on the central area or neighbouring inner districts of the city.

19. It seems clear that between 1920 and 1939 the central areas of most larger towns gained more, in terms of volume of trade and income from land and buildings, from their extended radius of influence than they lost from the centrifugal movement of population and business. The size of the central area did not increase very much—in marked contrast to the total built-up area—but the building accommodation which it contained increased considerably, as may be seen from a comparison of Figs. 9 and 10. This increase represented, in most towns, a net gain in accommodation for uses suitable for a central area—such as shops and offices—despite the concurrent outward movement of uses that chiefly comprised those unsuitable for a central area—such as dwelling houses and factories.

20. By the early 1930's, however, it became certain that a state of affairs in which the attraction of the central area was more powerful, on balance, than the co-existing centrifugal movement, could not long be maintained unless some effective means could be found to deal with the traffic problem. The existing streets were not capable of carrying a volume of traffic which, as is indicated by Fig. 12 approximately doubled between 1928 and 1938. Up to the outbreak of the recent war, Local Authorities made great efforts to deal with this problem, but few of them could claim that they had achieved more than a slowing down of the rate at which traffic congestion was increasing.*

*It should be noted that shortening of working hours, by which a greater proportion of workers begin and cease work at approximately the same hours, has also played a part in increase of congestion.





GROWTH OF ROAD TRAFFIC

growth of road traffic 1928-1938
daily flow of vehicles

possible traffic density in 1960
daily flow of vehicles

21. It therefore does not exaggerate the importance of the traffic question to say that by 1939 the future of the central areas of larger towns largely depended on its solution. Fig. 13 shows, on the basis of the 1938 road pattern, the increase of traffic volume which may have taken place by 1960 superimposed on the 1938 road pattern of a typical town, and although such a volume could probably never be reached on the existing roads the drawing indicates the scale of the problem which must be solved by the Planning Authorities of larger towns. Experience in the United States up to 1941 showed that the volume of business done in a central area had there become, or was becoming, directly related to its ease of access by motor car and the parking facilities available, and that when it became difficult to reach the central area by car, custom moved to suburban centres or other and less congested towns. If in 1939 the term " motor car " was broadened to include public service vehicles, there was every likelihood that central areas in this country might soon face a traffic problem somewhat similar to that being encountered in Amercian cities; and many towns realised that this was the decisive argument in favour of a radical redevelopment of their central areas, however big the difficulties might seem to be. In particular it was recognised that redevelopment must provide for the diversion of traffic which has no business in the central area so that, for example, the street shown in Fig. 14 can continue to function efficiently. In towns that have not suffered any considerable war damage the 1939 position is the position today.

III. THE SPECIAL PROBLEMS OF WAR-DAMAGED TOWNS

22. In a number of towns a portion, and sometimes a large portion, of the central area has been destroyed by air attack or the buildings damaged beyond repair, and the commercial and civic life of the towns has been suddenly upset, with no chance of restoration to full pre-war vigour for some years. The redevelopment problems of war-damaged towns differ from those of undamaged towns in two main ways. In the first place, the damage has both inflicted heavy financial losses on the local authorities and private firms and persons, and compelled firms displaced by air attack to find other accommodation. Some were accommodated in or near the central area by

MIXED TRAFFIC IN A CENTRAL AREA STREET

temporary adaptation of buildings or in other ways. Other firms moved to the suburbs or other towns. Similarly, a proportion of shoppers and other persons who had previously relied on the central area to meet some part of their needs, transferred their custom elsewhere. It is of great consequence to the future of war-damaged central areas that business activity in them should be restored to full vigour as soon as possible. In the second place, the size and complexity of the problem of redevelopment in a war-damaged town are much greater than any British Planning Authority has ever faced before. Only very rarely, as has been mentioned, has the central area of a British city ever been redeveloped in any radical way, and then only by the most cautious stages. Planning Authorities in war-damaged cities are now called upon to plan and stimulate the speedy redevelopment of anything from 20 to 250 acres of land, which are being or were being put to many different uses and are of the greatest importance to the life of the town. Moreover, this must be done at a time when, for several years at least, building labour and materials and the skill of the associated professions will be in very short supply. The Planning Authority will therefore find it necessary both to undertake new tasks and also to carry on contemporaneously a number of others which were previously done one by one over a period of years.

23. War-damaged towns have, however, one advantage over those which escaped, in that war damage has diminished the opposition to comprehensive redevelopment which arose from the fear of the long period of disturbance and unsettled values which it would involve. The major part of the disturbance has already occurred, and the inhabitants of damaged towns know that large-scale building operations must take place whether the central areas are replanned well or badly, and they naturally wish that they should be well planned.

IV. THE AIMS OF REDEVELOPMENT

24. The aim of redevelopment is to secure that all the activities that take place within a central area do so under the best practicable conditions. The main function of a central area is that of a chief meeting and exchange point, and it follows that the activities, and therefore the land uses, most suited to a central area are those that assist the fulfilment of this function. It follows also that land uses that do not assist such a fulfilment should be discouraged, and that the future size of each central area should be based on a careful estimate of the amount of land which will be needed to provide good conditions for the chosen uses.

25. The redevelopment plan and its supporting data should therefore show the proposed future location and size of the various zones in the central area, the density of building accommodation within them, and provision for the convenient circulation of pedestrian and vehicular traffic. It is also necessary that the plan should seek to retain and fortify well-established uses that are suitable for a central area, and it should be capable of execution by orderly stages without avoidable hardship to anyone.

26. Responsibility for the preparation of redevelopment plans rests with the Planning Authority to whom, therefore, this handbook is primarily addressed. But it will, of course, be recognised that the decisions incorporated in the plan should be the result of full discussion between the Planning Authority and other authorities and organizations concerned with its various aspects. The preparation of a good plan is essentially a work of collaboration, in which the role of the Planning Authority is that of both chairman and secretary. The fulfilment of the aims of redevelopment will require the exercise of great skill, judgment and imagination, and in the following pages a number of the problems which will be encountered are considered in some detail, and recommendations are made which should prove of assistance to Local Planning Authorities in the carrying out of a most difficult task.

Chapter 2: Survey

27. The aim of planning survey is to collect and summarise in a suitable form the information which a Planning Authority will need in order to guide development or redevelopment within its area. The survey which should be undertaken varies widely in range and detail according to the character of the area and the kind and scale of development which is likely to take place, and cannot therefore be fully considered in this handbook. The collection of information on certain subjects, however, is necessary for the preparation of redevelopment plans for the central areas of all towns, and the scope of this minimum planning survey is briefly reviewed in the following paragraphs. It may conveniently be divided into studies which are mainly concerned with land uses, services and condition of buildings in and near the central area—here called Local Survey—and studies mainly concerned with social and industrial conditions in the town as a whole and in the surrounding region—which are here called Regional Survey.

I. LOCAL SURVEY

A. Land Uses, Building Accommodation and Age and Life of Buildings

28. A redevelopment plan for a central area is intended to provide good siting conditions for approximately the right amount of each suitable use, and must involve some redistribution of existing uses, in terms both of land areas and building accommodation. In order to prepare such a plan it is necessary for the Planning Authority to know, first of all, the approximate amount of land and building accommodation which is in use within the existing central area for each main purpose, and the relationship to each other of the areas so used. The pattern of main uses in many towns, and particularly, of course, in war-damaged towns, has been temporarily distorted during the war, and existing conditions may not be a good guide to the town's peace-time needs. Planning is a continuous process and it is desirable that a "datum," against which later changes may be measured, should be established in a year of normal conditions. It is therefore recommended that surveys of land and building uses should be designed to obtain a picture of conditions as they were in 1939.* Once this picture has been obtained the Planning Authority will be able to decide the extent to which the 1939 provision for a particular use should be increased or decreased, in the light of particular factors, before being reprovided in the development plan. Every town differs from every other town in the proportions of land and building accommodation which are used for different purposes, and a fairly accurate knowledge of 1939 provision offers the best means of ensuring that provision in the plan does not seriously exceed or fall below the town's probable needs.

29. In a number of towns it will be desirable for the redevelopment plan to provide for some exchange of uses between the proposed central area and neighbouring land. In order to facilitate this exchange, and because the boundary of the proposed central area will not be accurately known at the time of the survey, it is suggested that the Local Survey should cover the whole of the area likely to be concerned in such an exchange. The area surveyed should therefore be somewhat larger than is likely to be needed for the proposed central area, and is referred to throughout this handbook as the *Survey Area*.

30. The areas in which buildings have been destroyed or damaged beyond repair, and the probable length of useful life of existing buildings in the Survey Area, will largely determine the stages by which the redevelopment plan can be carried out, and a survey for this purpose can conveniently be combined with a survey of uses and building accommodation.

31. Approximately accurate information concerning land and floor areas in use for various purposes in 1939, and probable useful life of buildings, can be obtained by a single field survey of a fairly simple kind. A survey which it is believed will be found adequate for this purpose is described in the following paragraphs, both in order to assist Planning Authorities that have not yet begun work on similar studies to make the

*In view of its use in connection with war damage payments, the 31st March, 1939, should be borne in mind as a suitable date for survey purposes.

best use of available staff, and also to clarify recommendations made later in the handbook. It is not suggested that Planning Authorities who have already begun survey work should change over to the proposed method if that which they are using will provide the same information.

Field Survey

32. It is suggested that the Survey Area should be divided into separate street blocks.* A separate Field Survey Sheet—see Fig. 15—would then be used to record information for each street block. The Field Survey Sheet would be used in conjunction with a cut-out from the largest scale Ordnance plan available (Fig. 16). If the largest scale available is 1/2,500, it is recommended that rough photographic enlargements, to about 1/500 scale, should be obtained.

33. The field surveyor would then obtain for the building or buildings on each plot the information shown in the sample in Fig. 15, to the columns of which the following notes refer.† In general, the notes refer to survey of existing buildings; buildings destroyed or damaged beyond repair are considered in para. 45.

34. COLUMN 1. Post Office street number of the building or buildings on the plot.

35. COLUMN 2. Number given to each plot for the purposes of the survey.

36. COLUMN 3. Plot area (sq. ft.). If the existing boundaries of the plot conform with those shown on the Ordnance plan, no entry should be made in this column. If the plan is out of date, the surveyor should draw in the proper boundary on the plan as correctly as he can by eye. No calculations of area would, of course, be done in the field.

37. COLUMNS 4 AND 5. Floor space within the building (sq. ft.). The surveyor should first check whether the ground floor of the existing building conforms with the Ordnance plan, in the manner described for plot area above. He should then enter in Col. 5 the approximate proportion which the area of each floor other than the ground floor bears to the ground floor. For example, the first entries in Col. 5 of the sample mean that the basement was half the area of the ground floor, the 1st floor the same area as the ground floor, the 2nd floor 2/3rds the area of the ground floor, and so on.

38. The floor area of the building should be taken as the sum of the roofed areas of the building at each floor level, including all wall thicknesses, corridors, staircases and basements. Field notes in Cols. 4 and 5 should later be replaced by office calculations of areas in square feet, obtained by measuring the areas of ground floors from the Ordnance plan and then estimating the proportionate areas of other floors.

39. COLUMN 6. Shop frontage (Feet run). The fraction entered in this column denotes the proportion of the street frontage of the building which was in use as a shop front.

40. COLUMN 7. Existing use. The use of each occupied floor should be entered in this column. The field surveyor should set down the specific use—e.g. solicitor's office, grocer's shop, etc. When the information obtained by the field survey is later summarised into the form in which it will be used most often by the planner (see Table 1, Fig. 17), specific uses should all be placed within one or other of the 13 groups of building uses (see Zoning Chart, Fig. 28, and *Appendix* 1.)‡ Vacant floors in buildings should be so noted.

41. Buildings destroyed or damaged beyond repair should be so described in the Field Survey Sheets. (See para. 45 below). Buildings damaged and under repair should be noted, and the uses to which they will be put when repaired should later be entered in Col. 7.

*By " street block " is meant an area which is bounded on all sides by public streets having carriageways but is not subdivided by any such street. For this purpose, roads primarily used for access to the rear of buildings, pedestrian ways and small paved spaces in the rear of buildings should not be regarded as public streets. (See Figs. 16, 18 and 19).

†The notes in paras. 34-44 refer primarily to survey of commercial and industrial buildings. Where rows of similar buildings similarly used, such as small dwelling houses, come within the Survey Area, each building need not be separately entered. Plot, Ground Floor and Other Floor areas for the whole row may be calculated from one sample.

‡When the floor areas in use for various purposes within a building are being calculated, it will be necessary to make sure that the total floor area of the building has been divided in the right proportions between the various uses. For example, a building might comprise a basement and 5 floors above ground level, of which the basement and 4th floor were wholly used for heating plant and tank rooms, the ground and 1st floors for a shop and the 2nd and 3rd floors for offices. Assuming that the shop and office floors were all of the same size, the total floor area of the building (including basement and 4th floor) should be divided equally between use group *D*: *Shops* and *E*: *Offices* (See Table 1 (Fig. 17) and *Appendix* 1)

STREET BLOCK. 15

POST OFFICE Nos.	PLOT Nos.	PLOT AREA sq. ft.	BUILDING AREA GRD. FLR. sq. feet	BUILDING AREA OTHER FLRS. sq. feet	SHOP FRONT feet run	EXISTING USES Note destroyed or vacant property	1939 USES Note vacant property	AGE & LIFE of BUILDINGS Note class A, B, C, D
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
			(32)	Gordon St. Torrence St. John St. Wrights Lane				
G.S. £7	1	2115	1980	B-½ 990 1st 1 990 2nd-2/3 1314 3rd-2/3 1314 4th-1/2 990	72	Grocer Solicitor typing Agency	Grocer Solicitor vacant	1900 C
£9	2	954	900	B-3/4 675 1st 1 900 2nd-3/4 450 3rd-1/2 450	18	destroyed	Dairy & Teashop Estate Agency vacant	D destroyed

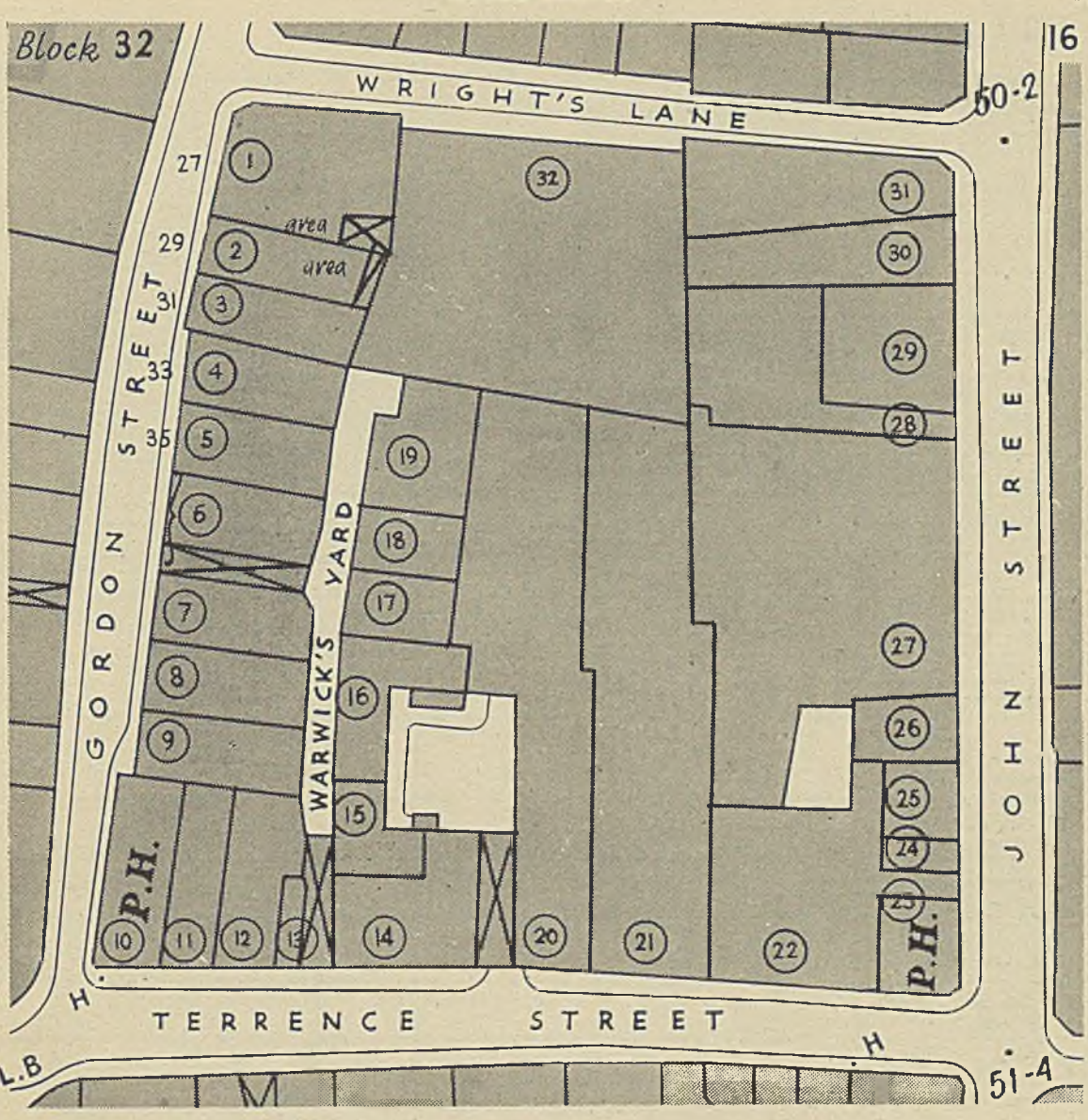
A SUGGESTED FIELD SURVEY SHEET

42. Later comparison of existing and 1939 uses (Col. 8) will disclose the extent to which war-time changes in uses are likely to be lasting (and should therefore be taken into account in preparing the plan), or are probably temporary—as, for example, buildings requisitioned as Government offices or containing firms displaced from other accommodation by air raid damage. An accurate existing use survey is therefore of great importance.

43. COLUMN 8. 1939 uses. The use of each occupied floor in 1939 should be entered in Col. 8 in the same way as described for existing uses in para. 40 above. As regards the majority, and usually the great majority of buildings, there will have been no change of use since 1939 and the existing use will therefore be the 1939 use. The use of some buildings will however have changed between 1939 and the date of survey, and, as mentioned previously, it is important that these changes should be brought to the notice of the planner by recording the 1939 use in Col. 8. It has been the Ministry's experience that the appropriate Local Authority official is usually able to correct existing uses into 1939 uses with little trouble, but where buildings were in multiple occupation in 1939 it may be necessary to make use of 1939 local street directories, Rate Books or the records of estate agents and owners.

44. A proportion of building accommodation in the Survey Area is likely to have been vacant in 1939. It is desirable that in obtaining information about the 1939 use of each building the Planning Authority should distinguish between occupied and vacant accommodation, and should record the latter as " vacant " in Col. 8. This is specially important in war-damaged towns, where a proportion of the occupiers of destroyed property have probably moved into previously vacant accommodation elsewhere in the Survey Area.

45. In order to complete the field survey data it will be necessary to obtain information concerning the plot and floor areas and 1939 uses of buildings destroyed or damaged beyond repair by air attack. The collection of this information should be put in hand as soon as possible, since it presents more difficulty than the field survey of existing buildings. In addition to the sources of information mentioned in para. 43, the



FIELD SURVEY MAP OF A STREET BLOCK *enlarged from an O.S. Map.*

deposited plans for new buildings and alterations held by the Local Authority's building surveyor, the records of the War Damage Commission, fire insurance records and pre-war aerial and other photographs will prove useful for this purpose.

46. COLUMN 9. Age and length of useful life of existing buildings. The age of buildings need be noted only with approximate accuracy, as a useful supplement to information on probable length of useful life.

47. All buildings should be grouped, as regards probable length of useful life, within one or other of the 4 following classes:—

Class A: Buildings which should be retained because of their architectural value, historic interest or special association with the life of the community.*

*The Ministry is now engaged in arranging for the compilation of the lists of buildings of architectural value or special historic interest in accordance with the provision of Section 42 of the Town and Country Planning Act, 1944. Unless such a list has already been prepared to cover the Survey Area the Ministry should be consulted about arrangements for its preparation.

TABLE 1. FLOOR AREAS

*Summary of Field Survey Sheets to show Floor Areas and Uses in the Survey Area in 1939, and Wartime Changes. Areas in Acres.**

BUILDING USES	1939				EXISTING					
	OCCUPIED		VACANT		INCREASES SINCE 1939		DECREASES SINCE 1939		NET CHANGE +or—	+or—
	Grd. Flr.	Other Flrs.	Grd. Flr.	Other Flrs.	Grd. Flr.	Other Flrs.	Grd. Flr.	Other Flrs.	Grd. Flr.	Other Flrs.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
A Dwelling Houses										
B Residential Buildings (other than Dwelling Houses)										
C Schools and Residential Colleges										
D Shops area feet run of frontage										
E Offices										
F Wholesale Warehouses										
G Storage Warehouses										
H Public Buildings and Places of Assembly										
I Special Places of Assembly										
J Light Industrial Buildings										
K Industrial Buildings										
L Special Industrial Buildings										
M Other Buildings										

*It may sometimes be preferable to express areas in thousands of sq. ft. instead of acres.

Class B: Buildings with long life; that is, comparatively new buildings which are not likely to be obsolete for at least 30 years.

Class C: Buildings with short life; that is, buildings becoming obsolete but which still have some years of useful life.

Class D: Buildings which have outlived their period of usefulness and should be replaced as soon as circumstances permit.

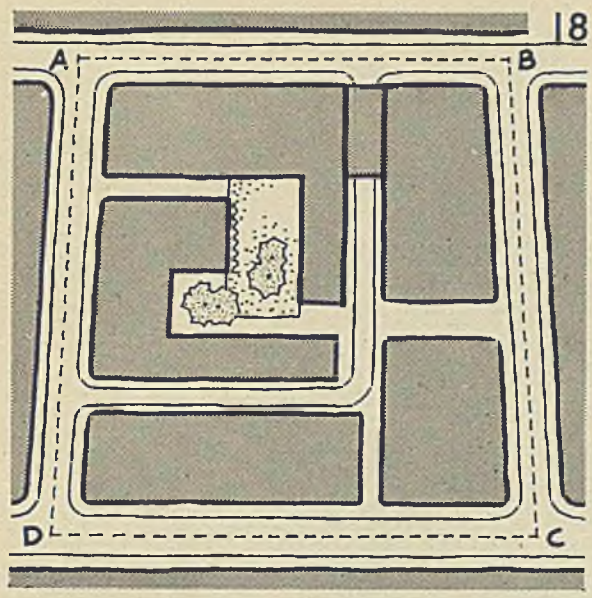
48. Entries in Col. 9 by the field surveyors should be regarded as provisional, and the classification should be carefully checked before the redevelopment plan is based upon it.

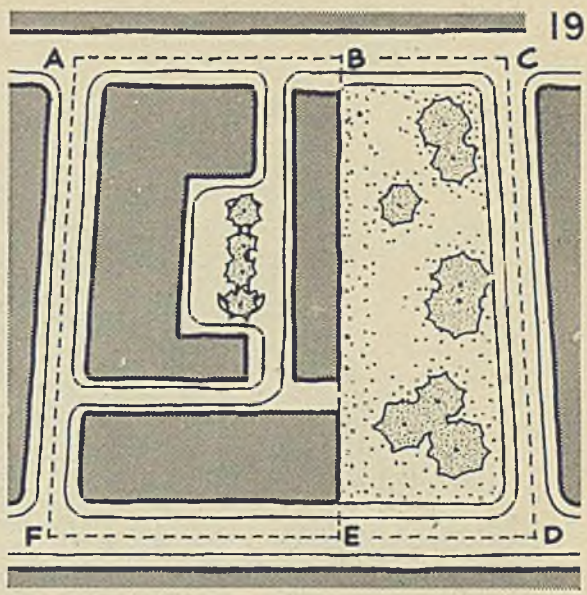
Summaries of Field Survey Information

49. When the field survey has been completed, it will be necessary to summarise the information contained in the Field Survey Sheets in a manner convenient for use in determining the main lines of the redevelopment plan. The information needed for this purpose can be simply presented in two tables.

Table 1 (Fig. 17) Summary of 1939 Floor Areas

50. Table 1 (Fig. 17) summarises under 13 groups of building uses the total amount of floor





CALCULATION OF FLOOR SPACE INDICES

A FULLY DEVELOPED BLOCK

floor area within ABCD = 9.2 *acres*
site area ABCD = 5.75 *acres*
F.S.I. for block ABCD = 1.6

A PARTLY DEVELOPED BLOCK

floor area within ABEF = 5.95 *acres*
site area ABEF = 3.5 acres
F.S.I. for block ABEF = 1.7
area of open space BCDE = 2.25 acres
gross F.S.I. for block ACDF = 1.03

space which existed in the Survey Area in 1939. (Definitions of and notes on the 13 groups of building uses are contained in *Appendix* 1). The following points should be noted:

51. (i) Some of the building uses listed in Table 1 are suitable for retention in the proposed central area, and others are unsuitable and should not normally be provided for in the plan. This question of suitable and unsuitable uses is considered in paras. 86-99 below.

(ii) Some uses require mainly ground floor accommodation and others do not, and therefore the floor area in use for each purpose is shown separately for " ground " and " other " floors.

(iii) Accommodation needed for shops is controlled by length of frontage as well as by floor area. Feet run of shop frontage is therefore shown separately.

(iv) Accommodation which was vacant in 1939 is shown separately for the reasons given in para. 44. Except for buildings under repair (see para. 41) there is likely to be very little vacant accommodation in the Survey Area at the time of survey and therefore the existing occupied accommodation may usually be taken as the total existing accommodation. In towns where this is not so, an additional column called " Existing Vacant " may be added to the Table.

(v) *Cols.* 6—11. These columns show the changes which have taken place since 1939 in the floor areas in use for various purposes. Cols. 6 and 7 show accommodation which has come into use since 1939, either by being newly built, by being changed over to a new use, or by the occupation of accommodation which was vacant in 1939. Cols. 8 and 9 show the decrease; i.e. accommodation in use for a given purpose in 1939 which is no longer in use for that purpose, either because it has been destroyed or has been changed over to some other use. Buildings under repair should be entered under the use to which they will be

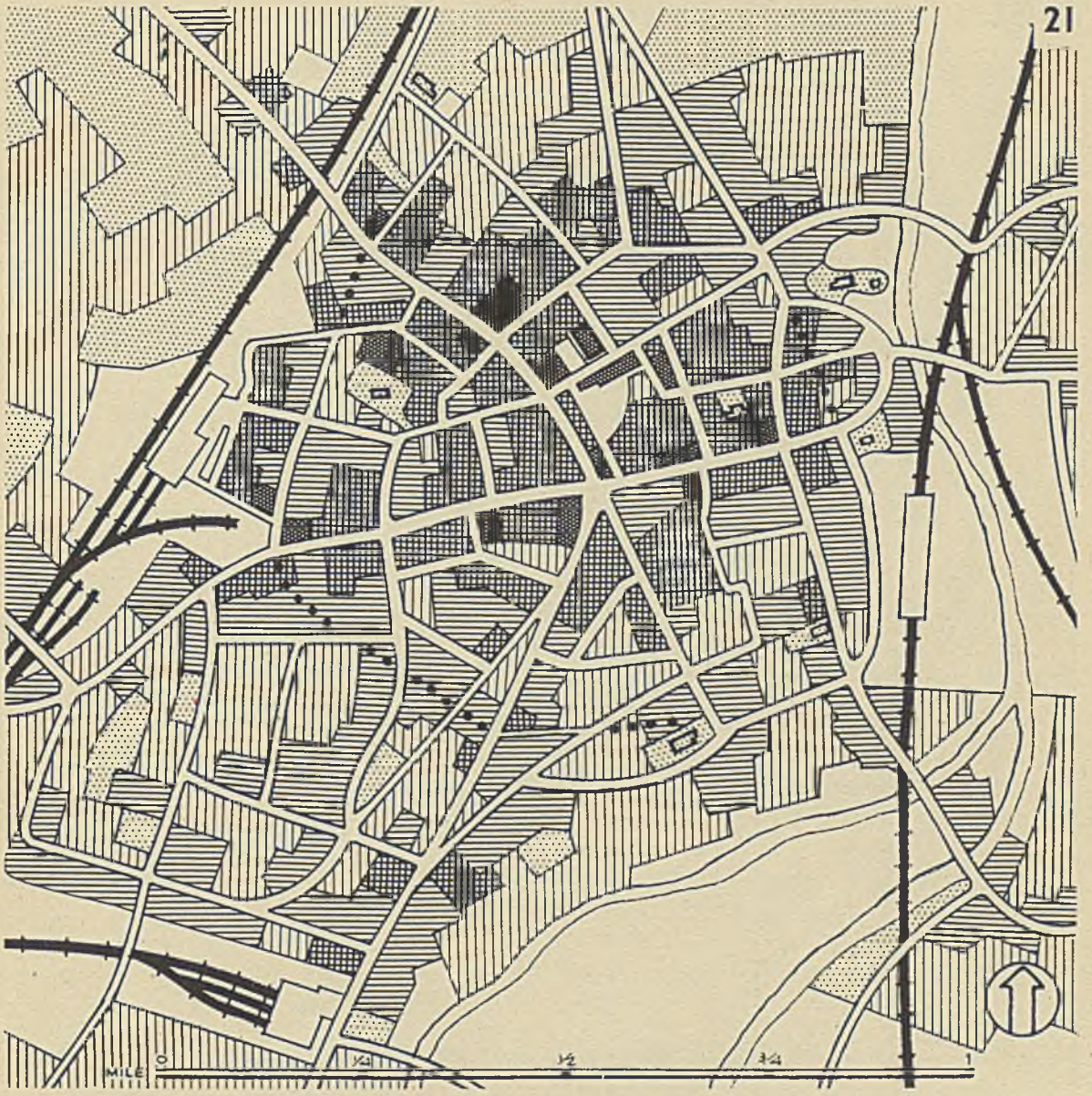
SURVEY AREA 1939 *areas of predominant uses*

shops
offices
educational, recreational and public buildings
wholesale business
light industry
industry
railway land
residential
open space

put when repaired. Cols. 10 and 11 show the difference between Cols. 6—7 and 8—9; i.e. they show the net gain or loss in the accommodation in use for various purposes.

The Floor Space Index

52. Table 1 (Fig. 17) shows the floor areas in use or available within the Survey Area for each main purpose, but it does not show these floor areas in relation to site areas. In other words,



SURVEY AREA 1939 *density of existing building accommodation*

F.S.I. up to .8

.8 *up to* 1.2

1.2 *up to* 1.6

1.6 *up to* 2.0

over 2.0

it does not show the density of building accommodation within a street block or within the Survey Area as a whole.

53. Throughout this handbook questions of the density of building accommodation are considered in terms of the relevant *Floor Space Indices*. A Floor Space Index is the ratio between the total area of the floors contained within a building (or buildings) and the area of the plot or other land area on which it stands.

54. The Floor Space Index for any building or buildings is obtained by dividing the total area

TABLE 2. DENSITY OF BUILDING ACCOMMODATION. 22

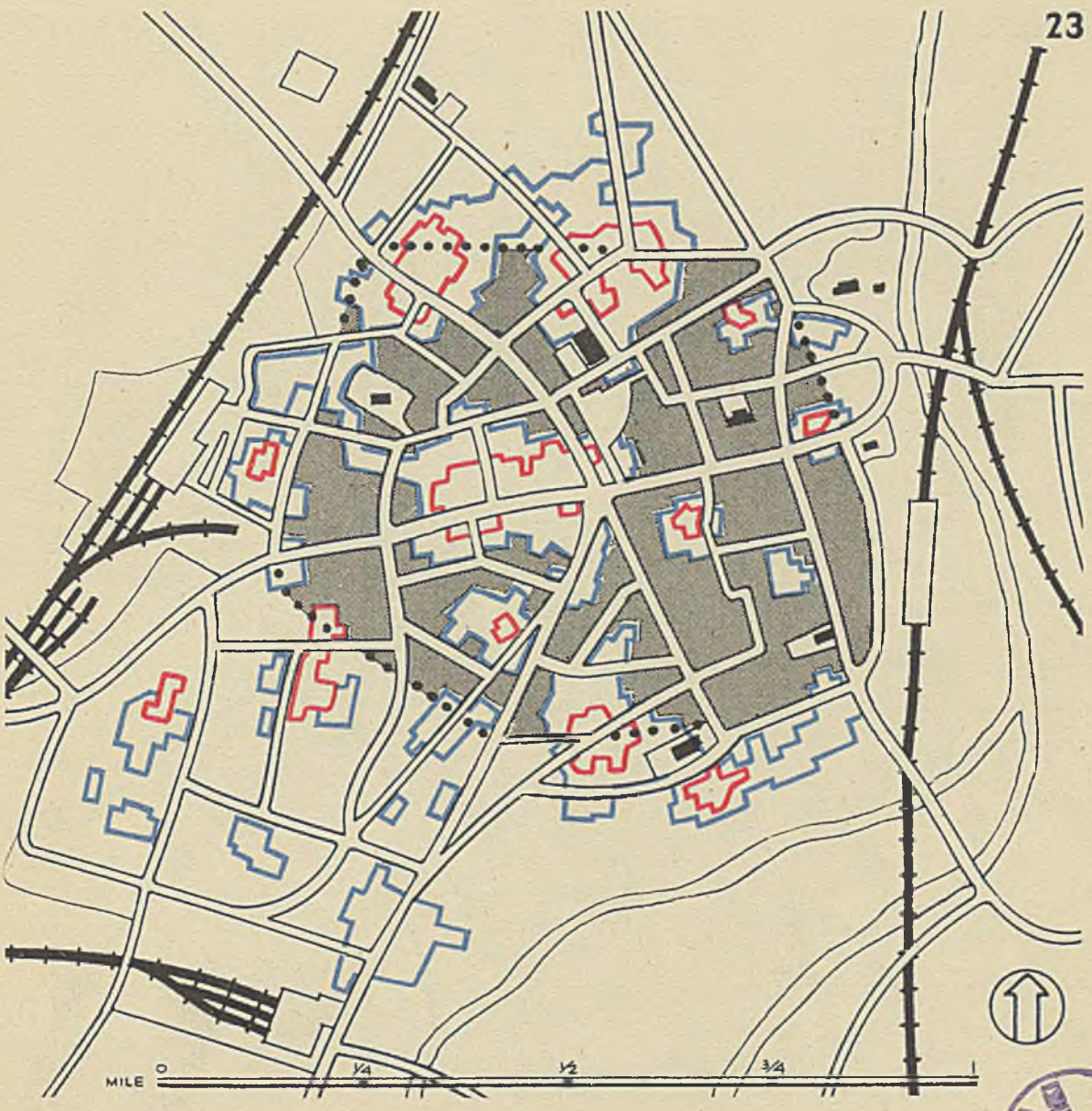
Summary of Field Survey Sheets to show Density of Building Accommodation in the Survey Area in 1939. Areas in Acres.

PART I

STREET BLOCKS	FLOOR AREA WITHIN STREET BLOCKS			GROSS SITE AREA OF STREET BLOCKS	FLOOR SPACE INDEX
	Ground Floor	Other Floors	Total	Including half the width of adjoining Streets	
(1)	(2)	(3)	(4)	(5)	(6)

PART II

ALL STREET BLOCKS					
OPEN SPACES and other land not included in Street Blocks					
TOTAL AREA					



SURVEY AREA *condition of buildings (obsolescence and war damage)*

A *buildings of special value* — *PERMANENT LIFE*

B *buildings in proposed central area and fit for LONG LIFE*

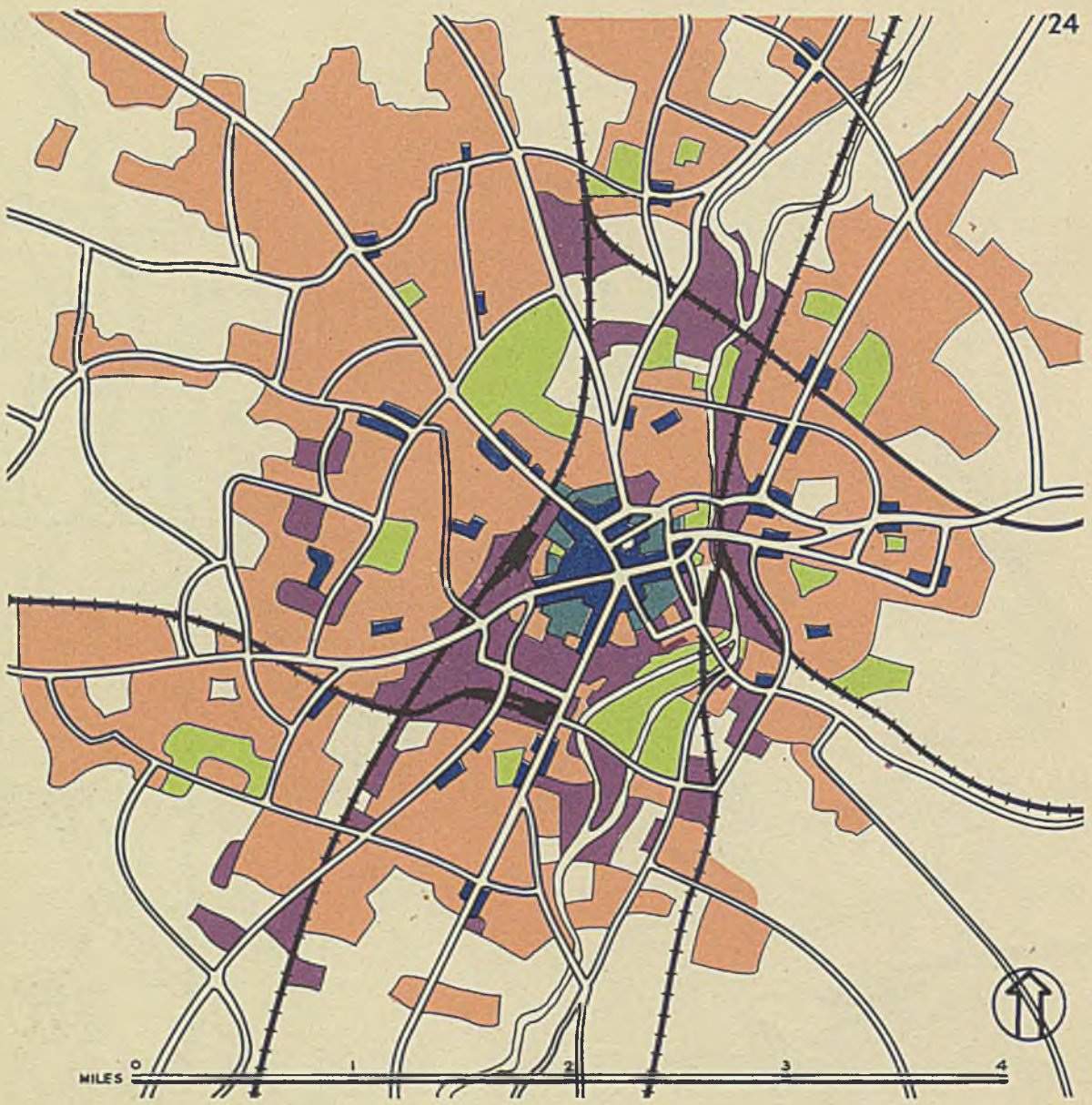
C *buildings fit for SHORT LIFE*

D *buildings destroyed or obsolete* — *NO LIFE*

of all the floors within the buildings by the area of the land plus half the width of the adjoining streets.

55. In calculating a Floor Space Index, the floor area of a building should be taken as the sum of the roofed areas of the building at each floor level, including all wall thicknesses, corridors, staircases and basements.

56. Half the width of adjoining public streets should be included in the plot area (or other land area) used in Floor Space Index calculations.

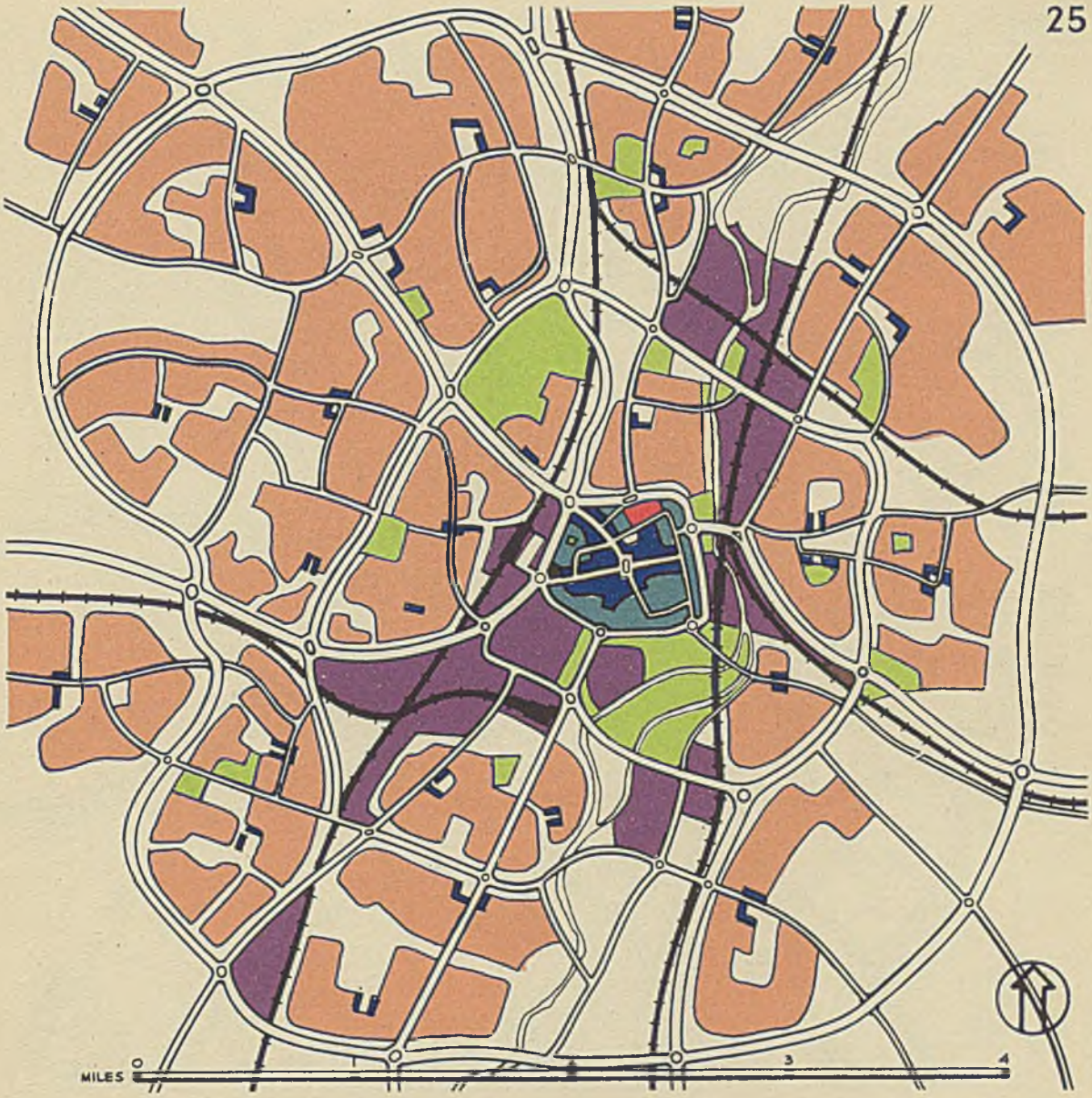


THE TOWN AS A WHOLE *existing use areas*

shops
business
industry and railway land
residential
open space

In calculating the Floor Space Index for a street block, internal access roads, pedestrian ways and small planted areas mainly used by the occupiers of the block, should be included in the gross area of the street block. For example, the gross site area of the street block in Fig. 18 is that contained within ABCD. Where, however, a street block is partly built-up and partly consists of a public open space, as in Fig. 19, ABEF may be taken as the gross area of the street block and BCDE may be separately measured and included with other open spaces.

25



THE TOWN AS A WHOLE *proposed outline plan*

shops

business

industry and railway land

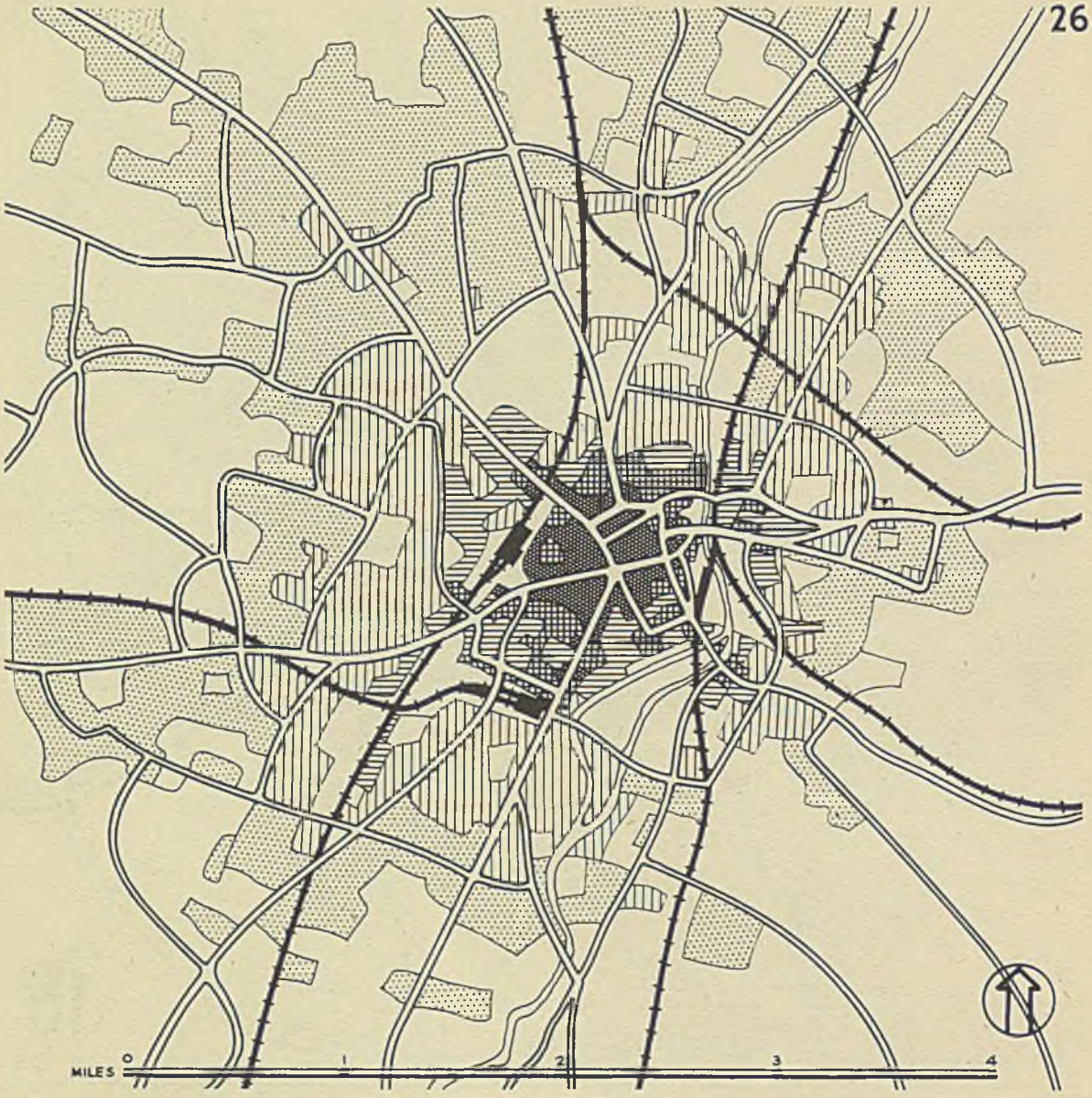
educational, recreational and public buildings

residential

open space

57. It should be noted that the Floor Space Index is not a guide to the number of storeys in buildings or to their height. A street block with a Floor Space Index of 2.0 may contain buildings with a uniform height, on all street fronts, of six or even eight storeys, and a single plot with the same Index may carry a five storey building covering about half the plot or a ten storey building covering about a quarter of the plot.

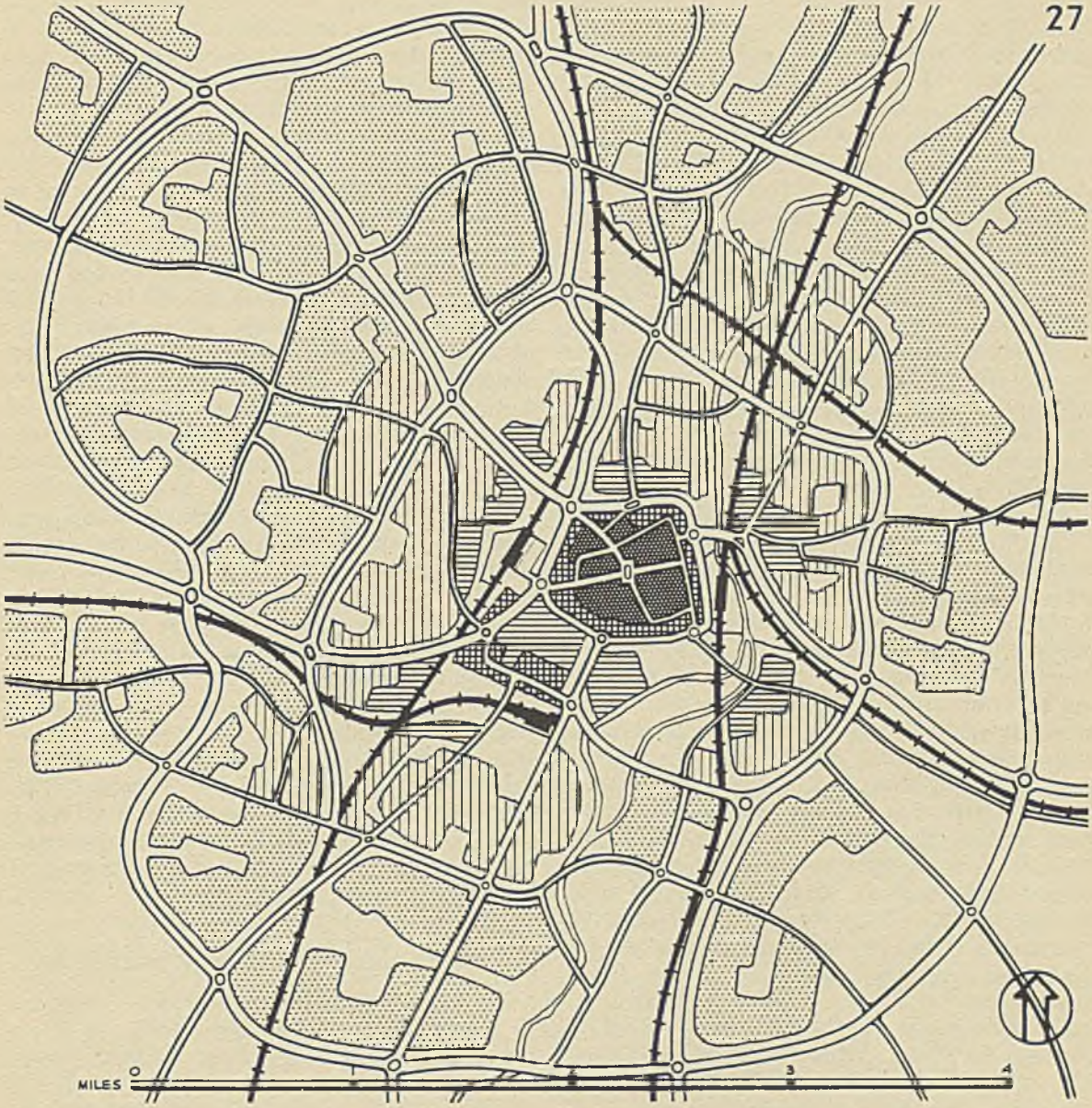
58. The preparation of the redevelopment plan



THE TOWN AS A WHOLE *density of existing building accommodation*

F.S.I. up to .4
.4 up to .8
.8 up to 1.2
1.2 up to 1.6
over 1.6

will require many decisions to be taken concerning the amounts of building accommodation which should be placed on land areas of differing size, and frequent comparisons will have to be made between such amounts. The Floor Space Index is considered to offer the simplest means of determining, comparing and controlling the building accommodation contained or to be provided within land areas of any size, from the Survey Area, or proposed central area, as a whole down to the single plot.



THE TOWN AS A WHOLE *proposed density of building accommodation*

F.S.I. up to .4

.4 up to .8

.8 up to 1.2

1.2 up to 1.6

over 1.6

Table 2 (Fig. 22) 1939 Density of Building Accommodation

59. Table 2 (Fig. 22) has been designed to record in a simple manner the 1939 densities of accommodation in different parts of the Survey Area. Part 1 of the Table may be completed for each street block in the Survey Area in 1939 or for a representative selection of street blocks. Part 2 may be completed for the Survey Area as a whole or for any major sub-division of it.

60. Part 1 of Table 2 may be completed for a street block in the following manner. The total ground floor areas of buildings within the street block in 1939 should be obtained from Col. 4 of the Field Survey sheet and entered in Col. (2) of the Table. Similarly the total area of other floors should be obtained from Col. 5 of the Field Survey sheet and entered in Col. (3) of the Table. The sum of these two figures should then be entered in Col. (4) of the Table. The Gross Site Area (Col. (5)) may then be obtained by measurement from the Ordnance Survey plan, and comprises the total area of the street block *plus half the width of the public streets which form the boundary of the street block*. The Floor Space Index for the street block is obtained by dividing the total floor area in Col. (4) by the Gross Site Area in Col. (5), and the resulting Index should be entered in Col. (6).

61. Part 2 of Table 2 (Fig. 22) may be completed for the Survey Area as a whole (or for a major subdivision of it) as follows. The sum of the areas in Cols. (2), (3), (4), and (5) of Part 1 of the Table should be entered in the first line of Part 2, opposite to " All Street Blocks." The figure to be placed in Col. (5) in the second line of Part 2 will represent all land not already included in the gross site areas of street blocks. It will therefore include (for example), public and larger private open spaces, railway land, small spaces in the centre of traffic roundabouts and the area of any river flowing through the Survey Area. The figure may be obtained by deducting the sum of the gross site areas of all street blocks (Part 2, 1st line, Col. (5)) from the total acreage of the area under review as obtained by measurement from the Ordnance plan. The overall Floor Space Index for the Survey Area (or other area under review) can then be obtained by dividing the total floor space within it (Part 2, 3rd line, Col. (4)) by the total land area (part 2, 3rd line, Col. (5)). This figure should then be entered in Col. (6).

62. Paras. 32—61 have described a method by which it is believed that Planning Authorities may obtain, in sufficient detail and within a reasonably short time, certain of the information which is essential for the preparation of a redevelopment plan for a central area. The method has been described at some length for two reasons. In the first place, the Ministry is convinced that a redevelopment plan for a central area cannot be properly prepared without a fuller knowledge of the kinds and amounts of building uses, and of the density of building accommodation, than it was customary to collect for the preparation of a planning scheme before 1939. Central areas contain the major part of the business and civic life of towns and great sums of public and private money will be expended on their redevelopment in the coming years. It therefore follows that the survey, which will greatly influence the manner in which these sums will be expended, must be such as will provide basic information in sufficient detail. In the second place, the description of a particular method of survey has the advantages both of indicating the scope of the information which it is desirable to collect and of suggesting, by sample tables and other means, the ways in which the information may be easily summarised and used in the preparation of the redevelopment plan.

63. The results of the survey described in paras. 32-61, when generalised and presented in map form, are indicated by Figs. 20, 21, and 23. It should however be noted that these maps should be prepared from the Field Survey information and should not be regarded as a substitute for a Field Survey as described in paras. 32-48. A generalised picture of areas of predominant use in 1939, on the lines of Fig. 20 could be prepared without any detailed Field Survey, but such a map would show neither the extent of the mixture of uses, which is fully shown on the Field Survey sheets, nor the 1939 totals of floor space in use for each main purpose, which are contained in Table 1 (Fig. 17). Without this information a generalised picture of predominant use areas is only of limited use to the planner.

B. Other Surveys within the Survey Area

64. Paras. 32-61 have considered the collection of information on uses, floor and land areas and age and life of buildings. Local Survey will also involve the collection of information on other subjects which will vary from town to town.

65. Attention is specially drawn to the need for full information on traffic conditions and population. The future prosperity of central areas will depend to a considerable extent on the success of the plan in providing for the smooth flow of traffic. Planning Authorities should therefore examine all available information on the growth of traffic in the Survey Area and along its approaches during the pre-war decade, the origin and destination of traffic, main points and times of congestion, and street accidents and the distribution and adequacy of pre-war parking facil-

ities.* In all towns the plan must take account of the total daytime population and numbers employed in the central area, and in many towns the stages by which the redevelopment plan can be carried out will be greatly influenced by the rate at which persons living under unhealthy conditions in the Survey Area can be removed and obsolete houses demolished.

II. REGIONAL SURVEY

66. In the preparation of a plan for a central area, account must be taken of the town's probable future place within the surrounding region, and of social and economic conditions and prospects both in the town and the region. In order to assist in giving guidance to Planning Authorities in these matters, the Ministry's Regional Officers have made studies of the resources and prospects both of localities and of the Regions as a whole. It will also be remembered, in this connection, that in the White Paper on *Employment Policy* (Cmd. 5527) the Government declared their intention to secure a balanced distribution of industry and labour throughout the country, and to give special help to those areas which have in the past suffered severely from unemployment. The officials of the Departments concerned regularly review the industrial position and prospects of localities, both in the Development Areas and, as is necessary if proper effect is to be given to the Government's intention, in all parts of the country.

67. It is therefore suggested that Planning Authorities should discuss with the Ministry's Regional Officers the range of information on social and economic conditions and prospects which it is desirable for them to obtain. The Ministry's Regional Officers will be able to suggest how best to obtain the information in a convenient form, and, in some cases, may themselves be able to provide what is needed.

III. TOWN PLANS

68. In a number of towns plans showing the main proposals for the area in which the town lies, or for the town as a whole, may have been completed before the redevelopment plan for a central area comes to be considered in any detail. This is obviously the right order of working and should be followed whenever practicable. In war-damaged towns, however, the recovery of a pre-war level of prosperity waits upon the reconstruction of a substantial portion of the damaged areas, and in these towns it may therefore be necessary to prepare the plan for the central area before the plan for the town as a whole has been fully worked out.

69. The scope of the proposals for the town as a whole, concerning which provisional decisions should be taken before preparing the plan for the central area, is indicated by Figs. 24-27. Fig. 24 shows the town as it was in 1939 and Fig. 25 shows in simple form the system of principal roads and the location of residential neighbourhoods, business and industrial areas and open spaces proposed for the town as a whole. Figs. 26 and 27 show 1939, and proposed, densities of building accommodation throughout the towns in terms of Floor Space Indices. Figs. 25 and 27 thus comprise a general framework within which the plan for the central area should fit into place.

*Guidance on traffic surveys is contained in paras. 35-46 of the report of the Ministry of War Transport's Departmental Committee, entitled *Design and Layout of Roads in Built-Up Areas*. See Bibliography No. 12. Frequent reference is made to this report in later chapters of this handbook.

Chapter 3: The Main Decisions

70. The decisions which have to be taken in preparing a redevelopment plan for a central area are of three main kinds; namely, those which concern:—

I the kinds of uses for which the plan should provide;

II the amount and distribution of the floor space, and land, that should be provided for each use; and

III the layout of the main streets.

These three kinds of decisions are, of course, intimately bound up with each other, and the preparation of a plan is essentially the many-sided process of adjustment between them; but for greater convenience in considering their more important aspects, they are in the main considered separately in this Chapter.

I. USES AND USE ZONES

A. Building Use Groups and Use Zones

71. The aim of planning is to enable all activities to take place under the best practicable conditions. The fulfilment of this aim requires that buildings with similar siting requirements should be grouped together, and conversely, that, in general, buildings with conflicting siting requirements should not be grouped together. It follows that the plan for the development or redevelopment of an area should provide for its division into a number of use zones, of which each should be laid out to provide suitable sites for particular classes of buildings. The following notes are intended to assist all those concerned with the use and development of land to determine, first, the category within which a proposed development will fall for planning purposes, and, secondly, the location which is most suitable for the development.

72. All building uses* may be placed for planning purposes within one or other of the 13 groups listed and described in *Appendix* 1. For convenient reference the 13 groups are lettered from A to M. *Appendix* 2 lists a large number of building uses and indicates, by the letter set against each use, the group to which the use belongs. *Appendix* 2 therefore comprises an INDEX by means of which developers may find out the use groups to which each of the great majority of proposed buildings will be held to belong. If any building use does not appear in *Appendix* 2, the Planning Authority should determine to which group the use belongs. Attention is drawn to the fact that in some cases a building development will belong to more than one use group. For example, a building which comprises a ground floor shop with flats above will belong both to *Group C: Shops* and to *Group B: Residential Buildings* (*Other than Dwelling Houses*), and its location may call for special consideration on this account.

73. The use zones proposed for any area should be shown on a map and the purposes of the several zones should be indicated by means of a Zoning Chart, of which an example is reproduced on the opposite page (Fig. 28). The letter P in the Chart indicates that the zone is primarily intended for the group of building uses opposite to which it appears. The letter X indicates that it would be contrary to good planning to allow within the zone any of the group of building uses opposite to which it appears. The absence of a letter against a group indicates that the grant or refusal of planning permission will depend upon the scale and exact location of the proposed development within the zone rather than upon its kind, and that therefore each proposal will be decided by the Planning Authority according to its individual circumstances. For example, dwelling accommodation in zones other than residential zones may be permitted for premises where the continuous attendance of caretakers or maintenance workers is necessary. The continuance of a non-conforming use may be permitted temporarily.

74. It should be noted that the Zoning Chart (Fig. 28) includes all use zones needed for planning purposes *whether in central areas or elsewhere*. Three of the zones shown in the Zoning Chart, namely zones, 1, 7 and 8 are unsuitable for a central area. (See paras. 86-100). In

*Most forms of development involve the erection of buildings, and the term " building uses " is therefore used to describe the various forms of development for which planning consent will be requested. Planning control however applies to the land and any buildings which may be erected thereon and it should be noted that some proposals for development do not involve the erection of buildings—for example, a timber yard or private sports ground.

ZONING CHART

BUILDING USE GROUPS AND USE ZONES

BUILDING USE GROUPS Index Letter — TYPE	ZONE 1 Residential	ZONE 2 Business (Shops)	ZONE 3 Business (Offices)	ZONE 4 Business (Wholesale Warehouses)	ZONE 5 Educational Recreational and Public Buildings	ZONE 6 Light Industrial	ZONE 7 Industrial	ZONE 8 Special Industrial
A Dwelling Houses	P	X	X	X	X	X	X	X
B Residential (other than dwelling houses)	P			X		X	X	X
C Schools and Residential Colleges		X	X	X	P	X	X	X
D Shops		P						
E Offices			P					
F Wholesale Warehouses	X			P	X			
G Storage Warehouses	X	X	X		X		P	
H Public Buildings and Places of Assembly					P			
I Special Places of Assembly	X			X				
J Light Industrial Buildings	X				X	P		
K Industrial Buildings	X	X	X		X		P	
L Special Industrial Buildings	X	X	X	X	X	X		P
M Other Buildings								

Zones suitable for a Central Area are enclosed by a heavy line.

addition to the use zones, the zoning map mentioned in para. 73 may also show open spaces of various kinds—such as public open spaces and those to which the general public will not have access. No building should be allowed in any of these open spaces save those needed in connection with their use as parks, school playing fields, etc.

75. A list of the recommended use zones is given below, together with short notes on the purpose of each zone and references to later paragraphs in which the purpose is more fully considered.

76. *ZONE 1: RESIDENTIAL.*

This is primarily intended for dwelling houses (see para. 87).

77. *ZONE 2: BUSINESS (SHOPS).**

This is primarily intended for shops (see paras. 90, 102-105 and 107-113).

78. *ZONE 3: BUSINESS (OFFICES).**

This is primarily intended for office buildings (see paras. 91 and 106-113).

79. *ZONE 4: BUSINESS (WHOLESALE WAREHOUSES).**

This zone will be appropriate only in large towns, where the number of wholesale warehouses will warrant the provision of an area specially devoted to them (see paras. 92 and 114-115).

80. *ZONE 5: EDUCATIONAL, RECREATIONAL AND PUBLIC BUILDINGS ZONE.*

This zone is intended for buildings that may suitably form part of a civic or neighbourhood centre (see paras. 94 and 116-119).

81. *ZONE 6: LIGHT INDUSTRIAL ZONE.*

This zone is intended for industrial processes of kinds that will cause no greater nuisance or disturbance to neighbouring occupiers than would a busy shop or office, and which will enable a high standard of amenity to be preserved (see paras. 96 and 120-123).

82. *ZONE 7: INDUSTRIAL ZONE.*

This zone is intended for factories, breweries, gas works and general industrial buildings (see para. 97).

83. *ZONE 8: SPECIAL INDUSTRIAL ZONE.*

A zone in which the industries, trades or businesses listed in *Appendix* 1 (under Special Industrial Buildings) may be carried on (see para. 98).

84. *ZONES* 2-6, for business, public buildings and light industry are suitable for a central area and are shown enclosed by a heavy line in the Zoning Chart (Fig. 28).

85. In certain towns and villages a special control may be needed for the protection of small areas which contain a group of buildings of special architectural value or historic interest. The individual buildings in such a group may not be of equal architectural value, but the effect of the group as a whole might be spoilt by the demolition of any one of them, by a change of use or by the intrusion of an inharmonious building.

B. Suitable and Unsuitable Uses in Central Areas

86. A central area being the chief meeting and exchange point in its surrounding area, one of the first steps in preparing a redevelopment plan is to decide the land and building uses which will best assist the fulfilment of this function, and also those which do not seem suitable for a central area. For this purpose, it is necessary, to examine in turn the 13 building use groups listed in *Appendix* 1, to which reference should be made for definitions and further notes on the groups.

87. *GROUP A: DWELLING HOUSES.*

The siting conditions necessary for dwelling houses—in particular, proximity to schools and open spaces and freedom from the dangers of heavy traffic—cannot be provided in central areas, and dwelling houses should therefore not be allowed within the central area.

88. *GROUP B: RESIDENTIAL BUILDINGS (OTHER THAN DWELLING HOUSES).*

For certain residential buildings—for example, hotels—a central location is essential for the conduct of the occupier's business. In general, however, it is considered that central areas, as defined in this handbook, are unsuitable for residential buildings. This particularly applies to residential buildings for family occupation, such as blocks of flats. Flats for family occupation have substantially the same siting requirements as dwelling houses and these cannot be fulfilled in central areas.

89. *GROUP C: SCHOOLS AND RESIDENTIAL COLLEGES.*

Non-residential and residential schools for children and residential colleges for adults have siting requirements which cannot be properly catered for in a central area. They should therefore be excluded.†

*In some cases, especially in small towns, it may be desirable to combine Zones 2 and 4, or 2, 3 and 4 into a single zone.
†Non-residential colleges for adults are included in Group H: Public Buildings and Places of Assembly.

90. *GROUP D: SHOPS.*

Shops are a most important use within central areas (see paras. 102-105 and 107-113).

91. *GROUP E: OFFICES.*

Offices are a most important use within central areas (see paras. 106-113 and definition in *Appendix* 1).

92. *GROUP F: WHOLESALE WAREHOUSES.*

Wholesale warehouses as defined in *Appendix* 1 are suitable for location in central areas (see paras. 114-115).

93. *GROUP G: STORAGE WAREHOUSES.*

Larger transit and storage warehouses, which do not include premises in which business is conducted, are in general unsuitable for location in central areas (see paras. 114-115).

94. *GROUP H: PUBLIC BUILDINGS AND PLACES OF ASSEMBLY.*

Public buildings and places of assembly are suitable for location in the central area (see paras. 116-119).

95. *GROUP I: SPECIAL PLACES OF ASSEMBLY.*

With few exceptions, special places of assembly are not suitable for location within a central area.

96. *GROUP J: LIGHT INDUSTRIAL BUILDINGS.*

It may be necessary or desirable for some firms engaged in light industrial processes, as defined in *Appendix* 1, to be located within the central area. Within the limitations suggested in paras. 120-123 below, light industrial buildings should therefore be allowed in the central area.

97. *GROUP K: INDUSTRIAL BUILDINGS.*

An industrial estate that is planned and equipped on modern lines occupies a large amount of land and does not contribute to the fulfilment of the central area's main functions. It is therefore recommended that Planning Authorities should encourage the removal of industrial buildings from the central area to a part of the town set aside and laid out for factories.

98. *GROUP L: SPECIAL INDUSTRIAL BUILDINGS.*

Special industrial buildings as defined in *Appendix* 1, should not be allowed in the central area.

99. *GROUP M: OTHER BUILDINGS.*

Each application must be separately considered.

C. Use Zones in a Central Area

100. Paras. 86-99 and the notes contained in *Appendix* 1, suggest that the building uses most suitable for location in a central area are: *shops; offices; wholesale warehouses; public buildings and places of assembly;* and possibly some *light industrial buildings.* It is therefore recommended that the plan should provide for the division of the central area into the use zones primarily intended for these four, or five, uses. These zones are:

ZONE 2: *Business* (*Shops*).
ZONE 3: *Business* (*Offices*).
ZONE 4: *Business* (*Wholesale Warehouses*).
ZONE 5: *Educational, Recreational and Public Buildings.*

and in some towns

ZONE 6: *Light Industrial.*

101. The requirements of these five zones are considered in turn in the following paragraphs.

ZONE 2: BUSINESS (SHOPS).

102. A shopping zone should provide the best practicable conditions for shopkeepers and their customers. Permission for other types of development within the zone should not be granted on a scale or in places which would endanger the shopping character of the zone or its efficiency for its primary purpose.

103. There is general agreement among traders that a shopping street should contain continuous shopping frontage of reasonable length on both sides. From this it follows that if shoppers are to be able to cross and re-cross the street in safety it should not be a main traffic route. On the other hand, the prosperity of a shopping zone will largely depend on ease of access by public service vehicle and motor car to the various premises within it. It is therefore undesirable that shopping zones provided in the plan should perpetuate the pre-war conditions under which the principal shops tended to be located on a single street, or a small number of streets, that were also main traffic routes, and extension of the shopping area took place along the length of the traffic routes. The general layout of shopping zones, together with siting of car parks and routeing of public service vehicles, should encourage the development of shopping zones in breadth as well as in length. It will assist in securing continuous shopping frontages in shopping streets if the plan provides for buildings which do not have shop front displays, for example banks, to be sited together in small groups at appropriate points in the shopping zone, or within office zones at points near to the shopping zone. (See also paras. 179-183 and 220-225).

104. The siting of car parks will require special attention as it will rarely be possible to allow cars

to wait for long periods outside shops. The siting of retail markets in shopping zones will also require care, in order to ensure that they will not break up the continuity of main shopping streets and that the vehicular traffic to which they give rise will not cause congestion in neighbouring streets. (See also paras. 207-215).

105. There should be ample provision for pedestrian circulation, and secondary access at the rear should be provided to premises which are likely to receive or despatch any large quantity of goods.

ZONE 3: BUSINESS (OFFICES)

106. Office zones are primarily intended for professional and business offices, including insurance, banking and commercial offices (other than those in wholesale warehouses). Office zones will need ample provision for pedestrians and adequate car parks, but in important ways their requirements will differ from those of a shopping zone. The achievement of high standards of daylighting and ventilation in buildings, and relative freedom from outside noise, will be much more important than the provision of continuous frontages to streets. Secondly, it will not generally be necessary to provide secondary goods' access to each building, although it will be a convenience if space for a few callers' cars can be provided within the curtilage of each larger building or building group. It will also be desirable for office zones to contain a number of small " lunch-time " open spaces. These requirements suggest that buildings in an office zone should be openly planned and set back from the street fronts, and that the intervening spaces might be used as small open spaces, or as public or private car parks, which would reduce the street noise reaching office accommodation. (See also paras. 143-144 and 226-231).

SEPARATE ZONES FOR OFFICES AND SHOPS

107. Since the siting and layout conditions most suitable for shops differ from those most suitable for offices, it is suggested that the bulk of accommodation needed for each of the two uses should be provided for in separate zones.

108. This suggestion takes account of the difficulty, which was fairly generally experienced in larger towns before the war, of letting office accommodation in the top floors of buildings over shops, and also of the tendency which existed for business firms to seek office accommodation in office buildings specially designed as such, or, alternatively, to invade central residential areas. Among the reasons for this movement away from positions over shops were probably the advertisement value of a good address, the superior convenience of offices in specially designed buildings, the relative inconvenience and difficulty of access to accommodation over shops, and, in the case of the invasion of residential areas, the quieter surroundings and better parking facilities. It seems probable that this tendency will continue and even grow in strength. It is therefore recommended that in larger towns the plan should provide for the location of the majority of shops and offices in separate zones.

109. The adoption of this recommendation will involve a break with previous custom and affect the layout and appearance of the central area in several ways.

110. When a building has been erected in a main shopping street, it has hitherto been customary to design the ground floor or lower floors for use as a shop, and to provide one or more floors of offices above. Usually this has been done in order to obtain the maximum return from an expensive site, but on occasions the building owner has been required to provide the offices in order to comply with an architectural control imposed by the ground landlords. If therefore it is intended to encourage the use of certain streets for shopping purposes only, the amount of accommodation which a developer is permitted to erect on a site in a shopping street should not be much greater, on the average, than that which is likely to be needed for shopping purposes. This question of the density of building accommodation in shopping streets is considered further in paras. 140-143 and 220-225 below.

111. Buildings erected in a zone should be required to conform to the layout requirements of the zone. For example, buildings in a shopping zone should be required to provide for continuity of shop front displays and rear access to most shop premises. If, having done this, a developer wishes to provide office accommodation on upper floors up to the total accommodation permitted by the Floor Space Index applying to his plot, he should be free to do so. It is however probable that unless such a building is of large size, office accommodation within it will compare unfavourably, as regards daylighting, ventilation, quiet and outlook, with accommodation in office buildings in office zones. When office tenants have once more a reasonable freedom of choice, they may therefore tend increasingly to seek accommodation in buildings specially designed and sited as office buildings. This probability should be particularly borne in

mind in deciding the accommodation to be provided in that portion of the central area which will be redeveloped first. It will usually be necessary, in war-damaged towns, that a large proportion of the first buildings to be erected should be shops, and any office accommodation provided over those shops will certainly be let without difficulty for several years. It is believed, however, that these conditions will be temporary and should not be used to justify the general provision of office accommodation over shops in main shopping streets.

112. If these factors are given due weight by the Planning Authority and developers during the preparation of detailed development plans and the disposal of sites, it is probable that the majority of larger shops will be located in shopping zones and specially designed office buildings will tend to congregate in office zones. A proportion of smaller shops are likely to be distributed throughout the central area. For example, the portions of the ground floors of office buildings that front on to streets would be suitable for shops serving office workers—such as tobacconists, cafés, hairdressers, etc.

113. In smaller towns, where separate shopping and office zones would be unsuitable, it is recommended that the Planning Authority should seek to apply the same principle by planning certain plots or street blocks within a combined shopping and office zone for the erection of office buildings.

ZONE 4: BUSINESS (WHOLESALE WAREHOUSES)

114. The warehouse zone is complementary to the shopping zone in that it is primarily intended for buildings which perform the same function in wholesale trade as shops perform in retail trade. The predominant type of building will therefore contain a large amount of storage accommodation, together with showrooms and offices for the transaction of business other than retail business, and provision within the site boundary for the loading and laying-by of goods' vehicles. The layout of the zone should be convenient for the circulation of goods' vehicles, but footways need not be so wide as in shopping and office zones, and smaller provision may be made for the parking of private cars. As has been mentioned in para. 93, larger transit and storage warehouses, that are not combined with offices for the transaction of business, are better placed outside the central area. (See also paras. 145-146 and 232).

115. The large volume of road or rail traffic generated by wholesale markets for perishable goods makes it difficult to locate them conveniently within the central area. If local circumstances make it necessary for such markets to be in the central area, they should be placed in the wholesale warehouse zone, and special consideration should be given to their traffic needs. For example, they might adjoin the inner ring road, although they should not have access directly therefrom. In general, it would seem preferable for such markets to be placed outside but near to the central area.

ZONE 5: EDUCATIONAL, RECREATIONAL AND PUBLIC BUILDINGS ZONE

116. In addition to the kinds of buildings for which the shopping, office, wholesale warehouse and light industrial zones (zones 2, 3, 4 and 6) are primarily intended, the central area will contain other kinds of buildings, among them buildings coming within *Group H: Public Buildings and Places of Assembly* (See *Appendix* 1). It will therefore be necessary to consider whether a special zone or zones should be provided for some or all of the buildings within this group.

117. It is of course inevitable and desirable that there should be some mixture of uses in every zone. But a good balance is essential. A proportion of secondary uses in a zone will both be necessary to serve workers and visitors and desirable to give architectural interest and variety. It may also help to preserve some historic buildings, which are apt to lose their quality if changed from their original use. But if secondary uses are too numerous they may reduce the suitability of the zone for the purpose for which it was intended and planned. If, for example, all the types of buildings included in *Group H: Public Buildings and Places of Assembly* that are suitable for a central area are left to be distributed between the shopping, office, wholesale warehouse and light industrial zones they might well diminish the convenience of those zones for their primary purposes.

118. One solution to this problem would be to provide a public buildings zone for some public buildings. Objections have been made to the collection of many of a town's public buildings within a single small area. Such a collection may tend to lower architectural values throughout the central area, both by the loss of the buildings themselves and the loss of their influence on neighbouring development. Existing public buildings are often of architectural or historic value, and their removal from their present sites, even in the long term, could not be lightly proposed. It has also been maintained that a suitable site for a

civic centre can rarely be found within the central area, and the centre thus tends to become a backwater which is both visually and otherwise out of the main stream of the town's daily life. Against these arguments must be set others of much weight. There is firstly, as has been mentioned, the diminution of the efficiency of other zones for their main purposes if many public buildings and places of assembly have to be accommodated within them; and the number of public buildings and places of entertainment is likely to increase in the future. Secondly, the quiet surroundings desirable for some of the buildings can more easily be provided if they are grouped together. Thirdly, there is the undoubted convenience for those who frequent them of having certain civic or university buildings grouped together within a small area. The weight which should be given to these several arguments will vary from town to town, and should be given special attention in preparing the redevelopment plan.

119. It is believed that in many towns it will be felt desirable to provide for one or more educational, recreational and public buildings zones (Zone 5) for the accommodation of a proportion of the public buildings and places of assembly that are likely to be needed in the central area. It will have been seen that the buildings included in *Group H: Public Buildings and Places of Assembly* (See *Appendix* 1) may be divided into several sub-groups—such as local government buildings; university and technical college buildings; places of entertainment, etc. The needs of these various sub-groups should be borne in mind in deciding the location and layout of the zone. It is recommended that in siting assembly halls, public libraries and community centres, preference should be given to sites that will encourage the maximum use of the buildings by the public.

ZONE 6: LIGHT INDUSTRIAL.

120. The central area of a town will be found almost invariably to contain a large number of small factories and workshops, accommodated sometimes in sheds and outbuildings but often in buildings originally built as dwelling-houses. A number of these workshops may be suitable for retention in the central area, and if so it is desirable to collect them together in the course of redevelopment and to rehouse them in suitable buildings; and if the number of the buildings is considerable they may suitably be located together in a light industrial zone. Workshops forming part of establishments primarily engaged in retail trade, and coming within the scope of Note (7) in *Appendix* 1, should be treated as shops.

121. It is recommended that the Planning Authority should assist the collection and grouping together of small workshops by encouraging the erection of an appropriate number of buildings which have been specially designed to meet their needs. The buildings might be either single storey or of several floors, and contain a number of workshops units, of which each might comprise a well-lighted workshop, some storage space and possibly simple equipment. It is suggested that the units might be let on short-term agreements.

122. Larger light industrial enterprises are, in general, unsuitable for location in central areas.

123. The layout of a light industrial zone should be generally similar to that of the wholesale warehouse zone, (Zone 4) except that special attention should be given to the daylighting of workshops. (See also paras. 150 and 233).

II. THE AMOUNT AND DISTRIBUTION OF ACCOMMODATION

124. The survey described in Chapter 2 will have disclosed the approximate amount of building accommodation that was in use in 1939 for each of the 13 groups of building uses (See paras. 87-99 and *Appendix* 1). Paras. 100-123 have described the use zones into which it is recommended that the proposed central area should usually be divided.*

Subsequent stages in the preparation of a redevelopment plan will comprise:—

(i) An approximate estimate of the amount of land that will be needed for the proposed central area, and for each main use.

(ii) A sketch plan showing the central area, proposed main traffic routes and use zones.

(iii) Examination of the area provisionally allocated for each main use, in order to decide the Floor Space Indices appropriate to the various parts of the central area and thus to check the size of the whole area.

(iv) Examination of the stages by which the plan could best be carried out.

*In smaller towns, zones 2 and 4 (See Fig. 28-Zoning Chart), or 2, 3 and 4 may be combined into a single zone.

(v) Preparation of a provisional layout plan.
(vi) Determination of zone boundaries.

125. The density of building accommodation within the central area will both control its size and, more than any other single factor, its efficiency and convenience for the activities which will take place within it. This question is therefore considered in some detail in the following paragraphs.

A. The Size of the Proposed Central Area

126. In approaching the question of the size of the proposed central area, the Planning Authority is recommended to make use of Tables 1 and 2 (Figs. 17 and 22) to provide a first answer, which can later be checked against the layout plans and in the other ways suggested below. (See paras. 130-133).

127. Cols. (2) and (3) of Table 1 show the total accommodation that was in use within the Survey Area in 1939 for each of the 13 groups of building uses. Some of these building uses are suitable for reprovision within the central area and others are unsuitable. (See paras. 86-99 above). The Planning Authority will find it simple to determine in the light of paras. 86-99, what proportion of the 1939 floor area for each use should be reprovided in the proposed central area. For example, the proportions suitable for reprovision might be:—

GROUP A:	Dwelling Houses	*Nil*
GROUP B:	Residential Buildings (other than dwelling houses)	25%
GROUP C:	Schools and Residential Colleges	*Nil*
GROUP D:	Shops	90%

—and so on.

128. Before finally deciding the amount of accommodation that should be provided in the plan, account must be taken of war-time changes, future trends and of whether the 1939 provision within the Survey Area for certain suitable uses was inadequate or too large (see para. 132). But for the purpose of a first estimate of the size of central area needed, the Planning Authority might assume that the accommodation to be provided in the plan comprises all that which was in use within the Survey Area in 1939 for purposes suited to a central area.

129. A target figure for the size of central area needed could then be obtained by:

(i) Examination of the areas predominantly used for particular purposes in 1939. This examination should cover both suitable and unsuitable uses.
(ii) Examination of the 1939 Floor Space Indices of the areas mentioned in (i). These may be obtained from Table 2 (Fig. 22).
(iii) Dividing the total accommodation to be provided by an appropriate overall Floor Space Index, the latter being based on that obtained from Part 2 of Table 2.*

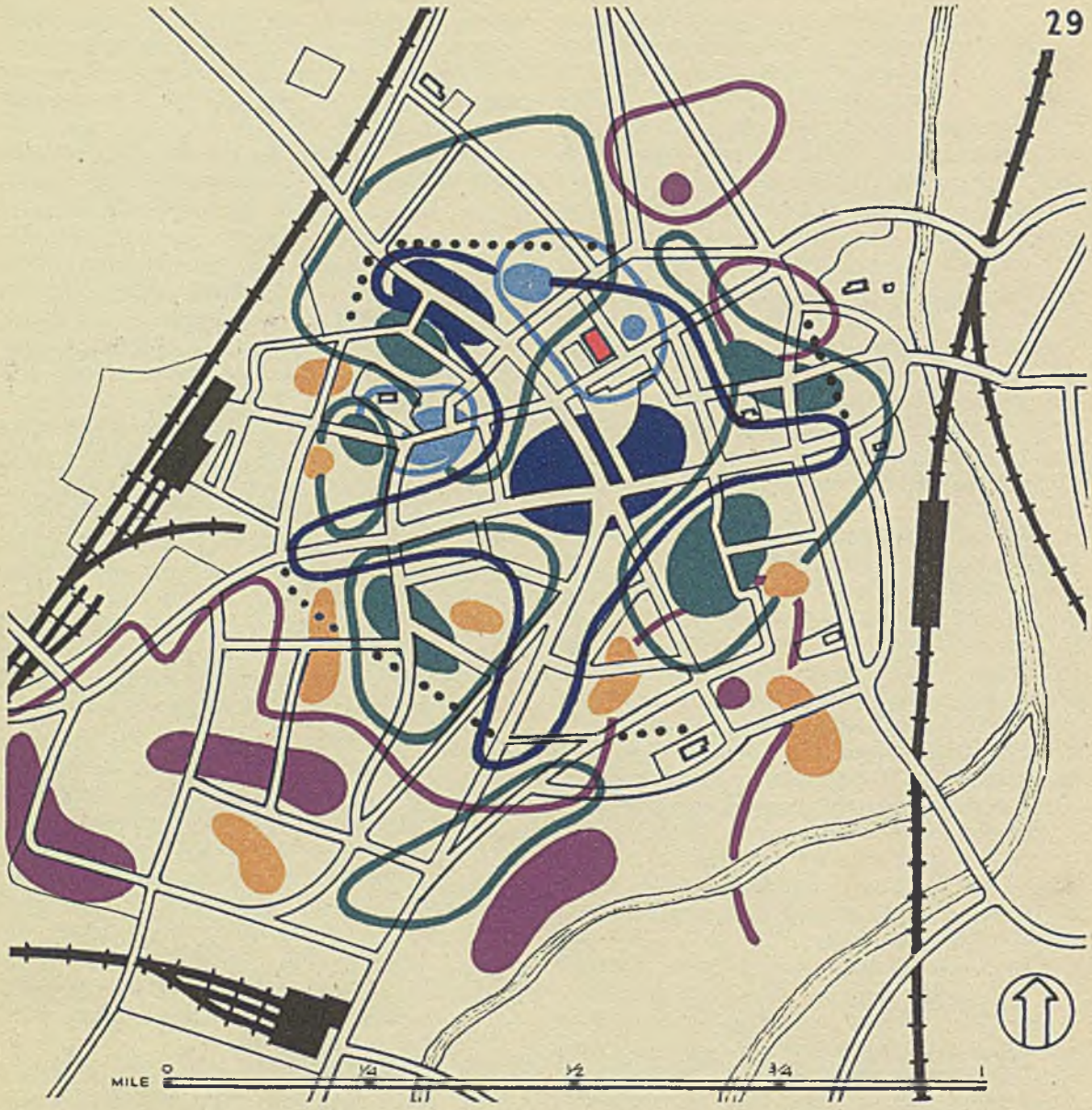
It is recommended that the Planning Authority should not rely exclusively on any one of these three methods, but should use all three.

130. Having delimited a provisional central area that seems likely to be of the right size, the Planning Authority should examine it in the light of the following general planning considerations:—

(i) Predominant pre-war uses in the various parts of the Survey Area, including uses that should be reprovided within the proposed central area and those that should not, and also established centres of particular activities—such as shopping, entertainment, shipping, etc. Established centres should not be moved unless there is strong reason for doing so.
(ii) The age and probable useful life of buildings throughout the Survey Area, including war damage.
(iii) The existing road pattern, and information concerning traffic flow, congestion, accidents and car parking provision and demand. It is of the first importance that the plan should provide for the smooth

*A rough calculation of this kind may be made as follows:

	Acres	*Floor Space Index*
(a) Total floor space of all kinds, both occupied and vacant, within the Survey Area in 1939 (obtained from Col. (4) of Table 2 (Fig. 22))	630	
(b) Gross site area of Survey Area (obtained from Col. (5) of Table 2, Part 2, bottom line)	420	
(c) Floor Space Index of Survey Area = total floor space divided by gross site area = (a) divided by (b)		1.5
(d) Total floor space in the Survey Area in 1939 that should be reprovided in the proposed central area (obtained from Table 1 (Fig. 17) amended as described in para. 127)	360	
(e) Acreage of a central area in which 360 acres of floor space could be provided at the average density of development which obtained in the Survey Area as a whole in 1939 = 360/1.5	240	



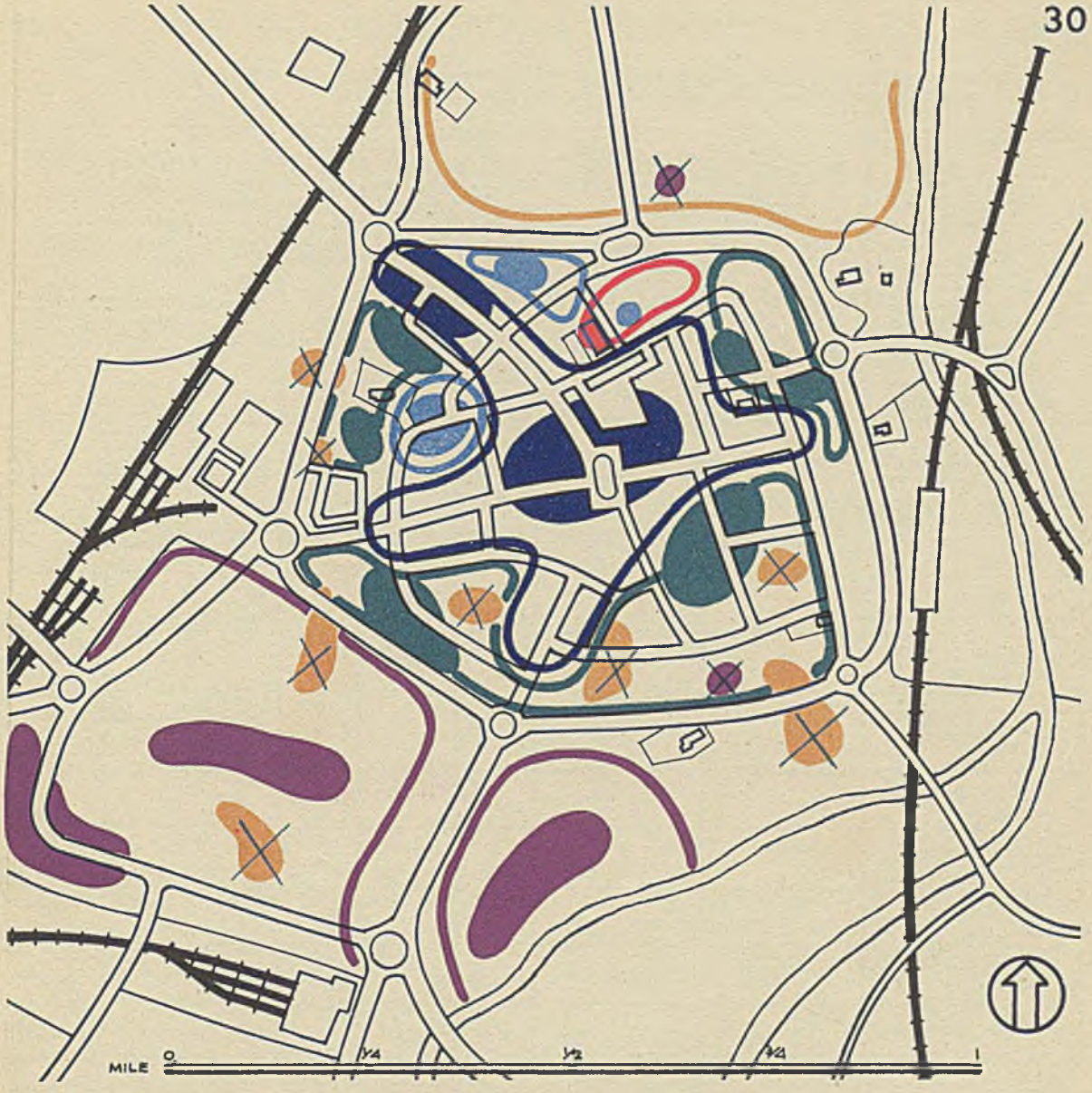
SURVEY AREA 1939 *centres of particular activities and overlapping of main use areas*

shops
offices
educational, recreational and public buildings
wholesale business
industry
residential

flow of all traffic that needs to enter the central area, and should make generous provision for car parking.

(iv) The need to include within the central area any prosperous commercial or office centre lying just outside the pre-war central area. If such a centre was excluded from the proposed central area, it might in future attract development that should be located within the central area.

(v) War-time changes in uses within the Survey Area.



CENTRAL AREA *existing centres of particular activities in relation to proposed use areas*

shops

educational, recreational and public buildings

industry

offices

wholesale business

residential

existing use centres unsuited to central areas and to be moved in re-planning

(vi) Any future increase in the population served by the central area or other changes in local conditions, which there are strong reasons for expecting.

(vii) The need for a well-distributed pattern of small open spaces.

(viii) The improved standards of accommodation, daylighting, ventilation and

TABLE 3. PROPOSED FLOOR AREAS 31

Summary of Floor Areas in use within the Survey Area in 1939 for purposes suited to a central area, and adjustments for reasons indicated in paras. 130–133 of the handbook. Areas in Acres.

BUILDING USES	FLOOR AREAS IN USE IN 1939 FOR PURPOSES SUITED TO A CENTRAL AREA		PROPOSED ADJUSTMENTS				FLOOR AREAS PROPOSED	
			INCREASE		DECREASE			
	Ground Flr.	Other Flrs.	Grd. Flr.	Other Flrs.	Grd. Flr.	Other Flrs.	Grd. Flr.	Other Flrs.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A Dwelling Houses								
B Residential Buildings (other than Dwelling Houses)								
C Schools and Residential Colleges								
D Shops area feet run of frontage								
E Offices								
F Wholesale Warehouses								
G Storage Warehouses								
H Public Buildings and Places of Assembly								
I Special Places of Assembly								
J Light Industrial Buildings								
K Industrial Buildings								
L Special Industrial Buildings								
M Other Buildings								

amenity which are now expected in new buildings. On the average, a new building will tend to be larger than an old building which it replaces.

131. The maps shown in Figs. 20, 21, 23 and 29 will be of assistance in reaching decisions concerning the size and boundary of the central area. Fig. 20 shows the location and approximate size of areas of predominant uses in 1939; Fig. 21 shows the density of building accommodation in 1939 in terms of Floor Space Indices; and Fig. 23 shows areas of war damage and the condition of existing buildings in terms of their probable length of useful life. Fig. 29 shows the approximate location of the centres of main uses in 1939, and indicates the areas in which these uses were most intermingled. It is suggested that the Planning Authority may find it useful to prepare a similar diagram to show the centres of particular activities—such as shipping, coal exporting, lawyers' and other professional offices, etc. Centres of this kind are often long-established and of great importance in the life of the town. Special consideration should therefore be given to any proposal to move them.

TABLE 4. PROPOSED DENSITY OF BUILDING ACCOMMODATION 32

Summary of Proposed Floor Areas and suitable Floor Space Indices to show approximate land area required. Areas in Acres.

PROPOSED BUILDING USES	PROPOSED FLOOR AREAS	APPROPRIATE STREET BLOCK FLOOR SPACE INDEX	APPROXIMATE GROSS SITE AREA REQUIRED
(1)	(2)	(3)	(4)
B Residential Buildings (other than Dwelling Houses)			
D Shops			
E Offices			
F Wholesale Warehouses			
J Light Industrial Buildings			
M Other Buildings			
TOTAL OF ABOVE USES		AVERAGE STREET BLOCK F.S.I.	
OPEN SPACE			
APPROX. AREA REQUIRED FOR PUBLIC BUILDINGS AND PLACES OF ASSEMBLY			

132. When account is taken of the considerations listed in para. 130, it may be desirable to increase or decrease the 1939 provision for uses that are suitable for a central area. Table 3 (Fig. 31) may be used to summarise the changes so made. Changes in the 1939 provision may be desirable for many reasons. In many provincial towns there are noticeably few hotels, restaurants and places of entertainment, and a deficiency of this kind must be remedied if the central area is to fulfil its proper function. It is also probable that the expansion of educational and social services will call for an increase in the number of community centres, technical colleges, etc.* On the other hand, if the plan provides for a removal of resident population from the Survey Area, it may be assumed that many of the local shops dependent on the resident population will move when their customers move. In deciding whether or not 1939 provision should be increased or decreased, the Planning Authority should pay special attention to the information on 1939 vacancies recorded in Table 1 (Fig. 17).

133. The weighing of these various considerations, and the completion of Table 3 in a manner which represents the best balance between them, will call for great skill and judgment. The decisions taken at this stage will govern the main form of the redevelopment plan, and will greatly influence the life and prosperity of the town for many years. Later decisions on matters of layout and design can do a great deal to achieve the full potentialities of a well judged estimate of the town's future needs; on the other hand, they can hide but cannot correct serious errors concerning the kinds and amounts of accommodation that should be provided, and the best size and boundary for the central area. Decisions on these fundamental matters should therefore be preceded by full discussions of the points listed in para. 130 with those who possess the fullest knowledge of them. When the decisions have been taken, and have

*In view of this expansion, the Local Education Authority should be consulted at an early stage in the preparation of the plan.

been recorded in Table 3, they may call for some change in the size of the proposed central area as previously estimated (see paras. 126-129 and 152-153).

B. Control of the Density of Building Accommodation

134. Whether the area obtained as described in the preceding paragraphs will prove the right size for the proposed central area will largely depend on whether the density of building accommodation, or Floor Space Indices, that existed in the Survey Area in 1939 will meet the needs of the proposed central area. This question is of great importance, and a first answer to it may be obtained by examining the general conditions that existed in 1939. A Survey Area that was closely built-up, contained little or no open space, and contained few wide streets but many which were narrow and twisting, may have had an overall Floor Space Index higher than would be desirable in the proposed central area. On the other hand, a loosely developed central area, that contained much undeveloped back land, may have had a Floor Space Index that is too low for a well planned, reasonably compact central area.

135. The Floor Space Indices adopted for the various parts of a central area should be such as will enable the following aims to be achieved:

(i) The provision of a street system adequate for the traffic that may be expected within each part of the central area, together with generous provision for parking and a well distributed system of small open spaces.

(ii) The regrouping of buildings within reasonably large and regularly shaped street blocks.

(iii) The provision of good conditions for each building, including a high standard of daylighting, ventilation, access for goods' vehicles, etc.

(iv) A reasonable compactness of building development within each street block, zone and the central area as a whole. Space within a central area is most valuable and should be efficiently used. In addition, central area uses are to a high degree interdependent, and provided that the needs of traffic, health and amenity have been satisfied, it is an advantage if buildings are near together.

136. The Floor Space Indices most appropriate for a particular town will depend upon topographical and other local conditions, including the type of town. For example, the Floor Space Indices suitable for the central area of an older market town are likely to be somewhat lower than those for a newer industrial and business town of the same population. The Floor Space Indices chosen should be based, in the first place, on those existing in the Survey Area in 1939. But this does not mean that the 1939 Floor Space Index of each street block should be reproduced in the plan. One of the main aims of the plan should be to reduce the great differences in density of development that existed before the war between different parts of central areas. (These differences will be readily apparent if the 1939 Floor Space Indices are calculated for a representative selection of street blocks in different parts of the Survey Area—see Table 2 (Fig. 22) Part 1). In seeking to reduce these differences, the Planning Authority will probably find it convenient, to decide upon a "normal" Floor Space Index that is likely to be appropriate for street blocks in most parts of the central area. Thereafter, when deciding the Floor Space Indices that should be applied to particular street blocks, the "normal" Floor Space Index may be increased or decreased to a reasonable extent in the light of the factors mentioned in paras. 140-151 and 159 below.

137. The Ministry has not yet been able to make a full examination of the Floor Space Indices of existing central areas, but the information that has been obtained indicates that in provincial towns of about 250,000 population the Floor Space Indices of individual street blocks range from about 4.5 down to 0.5, and that the average Floor Space Index for all street blocks does not much exceed 1.5. It would also appear that street blocks in towns of smaller population have a lower average Floor Space Index, but the Index does not decrease proportionately with population. This lowness of the average overall Floor Space Indices, even in the central districts of large cities, is a fact which should be carefully noted.* The average 1939 Floor Space Indices of street blocks in various parts of a town of 250,000 population are indicated in Fig. 21, and the 1939 Floor Space

*The 1939 figures for the City of London make an interesting comparison. The overall Floor Space Index for the whole City was 3.0, and that for the area round the Bank of England (the most densely built area of its size in the country) was 3.9. The average of the 10 highest street block Floor Space Indices was 4.9 and the average of the 10 lowest was 1.5.

Indices of certain street blocks in the same town are shown in Fig. 86.

138. If the redevelopment plan is to fulfil its purpose, the Planning Authority must decide upon an appropriate Floor Space Index for each street block, and every developer must be required to keep within that Index. The necessity for such a control of the distribution of building accommodation needs little emphasis. The plan aims to secure good conditions—of light, air, access and amenity—for all buildings in the central area, but it can only do so if it controls the distribution of building accommodation. If building accommodation becomes concentrated in one portion of the central area in a manner for which the plan does not provide, the fundamental basis of the plan will have been destroyed to an extent which no reasonable later modification of the plan can correct. For example, if the total accommodation needed for a certain use is provided within a much smaller area than had been planned, there will be no demand of the right kind for the remainder of the land set aside for that use. Furthermore, the street system may be overloaded in one portion of the central area and used much below capacity in another. It is thus essential that the distribution of building accommodation in the central area should be subject to a general control by Floor Space Indices, which will ensure a good balance throughout the area while allowing developers reasonable freedom to decide the form of building that will best meet their needs.

139. It is undesirable for the Floor Space Indices of street blocks to differ very much between different zones, or within any one zone. If marked differences exist between the Floor Space Indices applying to different zones, a temptation might arise for developers to seek sites within the zone with the highest Index, irrespective of the primary purposes of the buildings they wished to erect. (See para. 146). Similarly, if a markedly higher Index applied to one portion of a zone than to another, encouragement would be given to that concentration of values on a few favoured plots which was an unfortunate pre-war feature in many towns. It is therefore worth while to examine briefly the Floor Space Indices for street blocks that might be appropriate for the various zones of a particular town of about 250,000 inhabitants. It should be noted that the Floor Space Index figures in the following paragraphs are used only for purposes of explanation and it is not suggested that they are likely to prove generally suitable for the central areas of towns of 250,000 population.

C. The Floor Space Indices of Street Blocks in Central Area Zones

140. *ZONE 2: BUSINESS (SHOPS)*

The Floor Space Indices suitable for street blocks in each zone should be decided after taking account of the 1939 Indices in the zone, the land available for development after making allowance for improved layout, and the total accommodation which is to be provided in the zone—the latter, shown in Cols. (8) and (9) of Table 3, being based on estimated future demand. It should be noted, however, that Floor Space Indices in shopping zones will be affected by the recommendation in paras. 107-113 that provision of separately occupied offices over shops is likely to be less common in the future than in the past.

141. A street block Floor Space Index of, say, 1.5 in a shopping zone would allow an amount of accommodation on the average individual plot equivalent to between 3 and 4½ floors over two-thirds of the plot. In many towns this would allow as much accommodation as is likely to be needed for shopping purposes only, even in principal shopping streets. An occasional developer may desire more accommodation than is permitted by the Floor Space Index—e.g. for a department store on a plot of limited size. On the other hand, other developers may not require all their permitted accommodation, and the Planning Authority should encourage arrangements by which the total accommodation permitted within a street block can be shared between developers of plots within the block in accordance with their individual needs.

142. Many retail traders may desire to rent suitable premises rather than to build. Shopping accommodation of three kinds may therefore be in demand: namely, space on ground floors only; space on both ground and one or more upper floors; and space on upper floors only for tenants for whom ground floor show or sales space is not necessary—such as cafés, hairdressers and dressmakers. Demand for shopping space on upper floors only will, however, be limited. If therefore the Floor Space Index applied to the shopping zone is appreciably greater, on the average, than that required for shopping accommodation (together with storage space, lavatories and other ancillary floor space), developers will tend to provide offices for separate occupation over the shops. Office space over shops will compete with space in specially designed office buildings in the office zone, and if accommodation in the latter proves more popular there is a danger, as stated in para.

108, that office space over shops may become difficult to let after the first few years. It is therefore suggested that the Floor Space Indices applied to street blocks in shopping zones should not permit an amount of accommodation on the average site which much exceeds that likely to be needed for shopping purposes only.

143. *ZONE 3: BUSINESS (OFFICES).*

It has been stated in paras. 106-113 that the siting requirements of office buildings differ materially from those of shops. Under most circumstances, modern office buildings can best be provided in openly planned buildings that are set back from street fronts and use the space between the various wings or blocks as open space or private car parks. Buildings so planned in central areas of larger towns would have to be moderately high to pay their way, and providing that redevelopment takes place in units of reasonably large size, a street block Floor Space Index appreciably higher than 1.5 could be allowed without causing any serious difficulties as regards access, layout and daylighting. The proviso is important. The developer of a large plot or group of plots would be able to secure the amount of well-lighted office space which he desired and also provide space for callers' cars or a private car park on the unbuilt-on portions of the plot. This would be much more difficult to do on a small plot. (See also paras. 226-231).

144. In deciding the street block Floor Space Index for office zones, the Planning Authority should bear in mind both the total amount of office space likely to be needed and the fact that it is undesirable for Floor Space Indices to differ greatly between one part of the central area and another. Too high a Floor Space Index would tend to make the provision of office space dependent on a few developers who were prepared to spend large sums of money on the erection of high buildings and might result, if the developers were forthcoming, in an undesirable concentration of values in a small area and an overloading of one part of the street system. It is therefore recommended that, in general, the Floor Space Indices in office zones should not greatly exceed those fixed for shopping zones. For example, if the Floor Space Index for street blocks in the shopping zone is 1.5, the average Floor Space Index for street blocks in the office zones should not usually exceed 2.0.

145. *ZONE 4: BUSINESS (WHOLESALE WAREHOUSES).*

Since a large part of the floor space in buildings in the wholesale warehouse zone is likely to be used for storage and will not require a high standard of daylighting, a Floor Space Index somewhat higher than in the shopping or office zones would usually be quite practicable, both as regards the convenience and healthiness of the buildings for their occupants and the load on the traffic system of the central area. But in this zone also, the aim of the Planning Authority should not be to fix the highest Floor Space Index that is technically possible given a developer ready to take advantage of it, but one which is likely to suit the average developer over a period of years and bring about a fairly even spread of building volume, and consequently of values, over the whole central area. It is therefore suggested that in a town where the Floor Space Index for street blocks in the shopping zone is 1.5, the street block Floor Space Indices in the wholesale warehouse zone should not usually exceed 2.25.

146. In a town where the average street block Floor Space Indices in the shopping, office and wholesale warehouse zones were respectively 1.5, 2.0 and 2.25, a few developers of shops and offices might be tempted to erect their buildings in the wholesale warehouse zone rather than in the shopping zone, especially when the wholesale warehouse adjoined the shopping or office zones. The Planning Authority may prevent any applications of this kind, which are not likely to be numerous, by ruling that the Floor Space Index which will apply to any development will be the lower of those applying in the zone to which the development properly belongs and in the zone in which it is proposed to carry out the development. Under this rule a shop in an office zone would be limited to the Index of 1.5 applying to shopping zones, as also would an office building in a shopping zone. Where a building is intended for mixed use, e.g. shops and offices, or where a place of assembly is to be located in a zone other than the educational, recreational and public buildings zone (Zone 5), it would be necessary for the Planning Authority to decide the appropriate Index. These decisions should be such as to encourage developers to seek a site in the zone most suited to the main use of a proposed building.

147. *ZONE 5: EDUCATIONAL, RECREATIONAL AND PUBLIC BUILDINGS.*

This zone is likely to contain a small number of each of many different types of building, and the siting conditions most suitable for the various types of building may vary greatly. In addition, the zone may contain in some towns a relatively

greater amount of open space or other unbuilt-on land than other zones. For these reasons, the Floor Space Index is not a suitable instrument for controlling the detailed distribution of building accommodation in the zone.

148. The total accommodation likely to be needed in the zone will have played its part, as described in paras. 130-133, in determining the approximate size of the proposed central area. Thereafter, the Planning Authority is recommended to arrive at a suitable distribution of building accommodation within the zone by listing the more important buildings likely to be located within it, and by preparing sketch layout plans to show the locations and plot areas of more important buildings and the street blocks within which smaller buildings might be grouped. The proportion of the total number of public buildings and places of assembly which will be located outside the educational, recreational and public buildings zone will vary from town to town, and is likely to be appreciable in all towns.

149. In towns where the Planning Authority desires a high proportion of public buildings and places of assembly to be located within the educational, recreational and public buildings zone, special care will be necessary to ensure that sites in the zone intended for commercial buildings—including such buildings as cinemas, dance halls and billiards saloons—are likely to prove attractive to developers.

150. *ZONE 6: LIGHT INDUSTRIAL.*

In central areas where a light industrial zone is provided, it should be intended mainly as a collecting point for the small independent workshops of which a large number exist in the central areas of most towns. These concerns will usually wish to rent suitable accommodation, which might be provided in either single-floored or multi-floored buildings. A small number of larger concerns, who wish to build their own buildings, may also seek plots in the zone and these buildings are likely to be of one or two floors only. Provision should be made for the loading and unloading of goods' vehicles within the various plots, and yard space for storage of bulk materials and containers is likely to be needed. These considerations suggest that a street block Floor Space Index of 1.5 would probably prove high enough to meet the needs of most light industrial development. But, in practice, it may prove difficult to distinguish in a clear-cut manner between buildings which should be in the wholesale warehouse zone and those which should be in the light industrial zone. In a town in which development in the light industrial zone is likely to comprise buildings of 1 or 2 floors with a high proportion of workshop and office space, the street block Floor Space Indices in the zone should probably not be higher than 1.5. On the other hand, where the demand is for buildings with a high proportion of storage space, and in which only a small proportion of floor space will be used for manufacturing or processing, the Floor Space Indices in the zone might be similar to those in the wholesale warehouse zone.

151. Recommendations concerning the choice of average Floor Space Indices for street blocks in the various zones of a central area may therefore be summarised as follows:—

(i) The Floor Space Indices should be chosen after careful consideration of: (a) the 1939 Floor Space Indices in the various parts of the Survey Area; (b) total accommodation likely to be required for each main use; and (c) the area available for development after making provision for improvements in traffic circulation and layout.

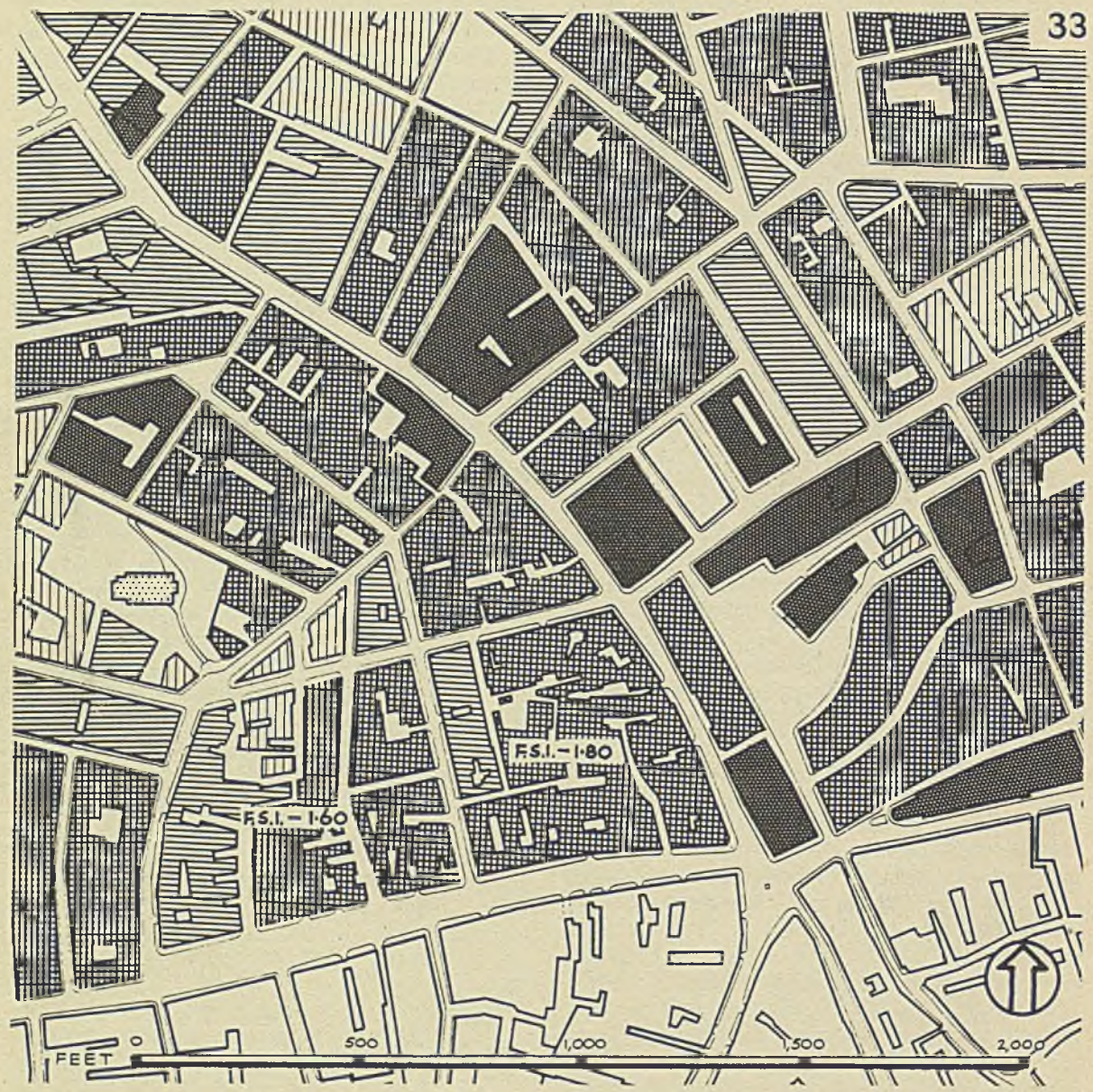
(ii) It is undesirable for marked differences to exist between the average street block Floor Space Indices applying in the shopping, office, wholesale warehouse and light industrial zones.

(iii) If differences are thought necessary between the Floor Space Indices of zones, it will probably prove desirable for the lowest Index to apply to the shopping zone (Zone 2), the next lowest to the office zone (Zone 3) and the highest to the wholesale warehouse and light industrial zones (Zones 4 and 6). The range of variation might be of the following order in a town where the street block Floor Space Index for the shopping zone had been fixed at 1.5:—*Zone* 2, 1.5; *Zone* 3, 2.0; *Zones* 4 *and* 6, 2.0-2.5.*

152. Planning Authorities will find it convenient to use Table 4 (Fig. 32) as a check upon the size of the central area, as well as of any particular zone.

153. The floor area to be entered in Col. (2) of Table 4 is the sum of Cols. (8) and (9) of Table 3 (Fig. 31). The Floor Space Index to be entered in

*This example is intended only to illustrate the desirable range of variation in normal circumstances. It is not intended to suggest that the Indices quoted will prove generally suitable in central areas.



PART OF SURVEY AREA *floor space indices of existing street blocks* *average F.S.I. for area*—1.70

F.S.I. up to .8

.8 *up to* 1.2

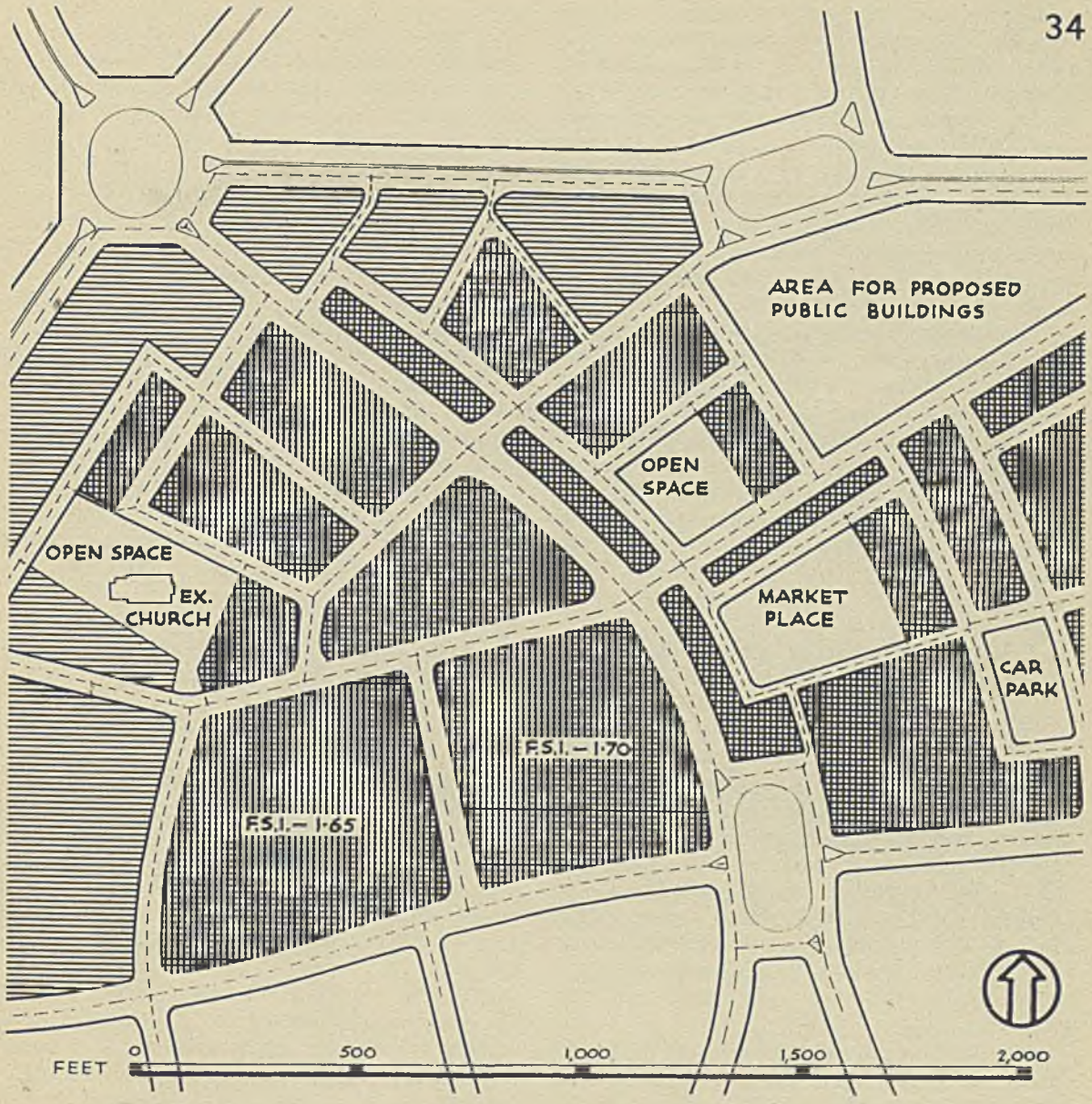
1.2 *up to* 1.6

1.6 *up to* 2.0

above 2.0

Col. (3), is that thought appropriate for a street block containing development of only one kind—e.g. shops or offices or wholesale warehouses. Col. (4) may then be completed by dividing figures in Col. (2) by those in Col. (3), and will show the approximate total size of the central area required to contain the proposed total accommodation shown in Table 3 (Fig. 31).

34



PART OF CENTRAL AREA *floor space indices which might be applied to street blocks when the area shown in Fig. 33 is redeveloped*

1.2 *up to* 1.6 1.6 *up to* 2.0 *average F.S.I. for area*—1.65

D. Accommodation to be provided for in each Zone

154. Every zone will, of course, contain when redeveloped a mixture of building uses, and it will not be possible to forecast accurately the proportions in which the various building uses will be represented in a particular zone. But an approximate estimate of these proportions should be made, based in part upon 1939 conditions

and in part upon the greater segregation of main uses which the plan aims to encourage and which, in view of the powers of control now available to Planning Authorities, is likely to be achieved. If, for the sake of example, the main shopping area in 1939 contained, in terms of floor space, 40% shops, 30% offices, 10% places of assembly and 20% other uses, the provision of separate shopping, office, warehouse and light industrial zones may be expected to lead to a considerable increase in the percentage of the accommodation in the shopping zone (Zone 2) which is occupied by shops and a decrease in the percentage occupied by offices and other uses. The extent of the changes which may be expected will vary from town to town. Some mixture of uses will of course occur in all zones, and particularly in the shopping zone.

155. The existing Floor Space Indices of certain street blocks in a central area, and those which might be applied to the same street blocks when redeveloped, are shown in Figs. 33-34 and 86-87.

E. The Floor Space Index applied to Individual Plots

156. Having decided the Floor Space Index which should apply to a street block, it will be necessary for the Planning Authority to consider how the Index should be used to control the distribution of accommodation between the various plots within the street blocks.

157. The simplest method of control would be to apply the Floor Space Index for the street block to each individual plot so that the accommodation which could be built on each plot would be directly proportionate to the gross area of the plot.

158. Alternatively, where a group of developers desired to develop a number of plots or a street block as a whole, they may be asked to decide between themselves how the total accommodation permitted by the Floor Space Index should be allocated between the several plots, subject to the considerations mentioned in para. 160.

159. In general, the same Floor Space Index, should apply to all street blocks in the same zone and to all plots within a street block, but on occasions it may be desirable to depart from this rule. For example, the Floor Space Index permits proportionately more accommodation to be placed on a plot fronting on a wide street than on one fronting on a narrow street, and such differences may prove undesirable for two reasons. In the first place, streets in a central area should be wide or narrow according to the part they are designed to play in the traffic system of the central area as a whole; and the fact that a street is wide is therefore no good reason why plots fronting on it should carry proportionately more accommodation than plots elsewhere. In the second place, values may tend to concentrate on plots on which proportionately more accommodation may be built, and later developers may be unwilling to consider taking plots located elsewhere than in the immediate neighbourhood of such a concentration.* For these reasons, the Floor Space Indices of plots adjoining specially wide streets may be appropriately lowered. There may also be other special circumstances in which a variation is desirable between the Floor Space Indices applied to neighbouring plots or street blocks.

F. The Floor Space Index applied to Different Types of Building

160. It has been stated that the use of the Floor Space Index is the simplest method by which Planning Authorities can determine, compare and control the density or distribution of building accommodation within areas of land of any size. In order to obtain the best results from the use of this method, it will, of course, be necessary to have proper regard to the types of building within the area to which the Floor Space Index is being applied.

161. The conditions most favourable to the use of Floor Space Indices in a straightforward manner are those in which most of the development in the area under consideration comprises buildings of one or more floors having a floor to floor height of 9 to about 12 feet, and having siting requirements only of the general kinds mentioned in paras. 102-115 and 120-123 in regard to shopping, office, warehouse and light industrial zones. The great majority of buildings which are suitable for location within a central area come within this description. The building types which do not come within the description may be divided into three broad classes:—

*The Central Advisory Committee on Estate Development and Management have stressed the disadvantages of a concentration of values in central areas. Ministry of Town and Country Planning. Estate Development and Management Problems in War-Damaged Areas, paras. 15-17. See Bibliography No. 8.

(i) *Buildings of large floor to floor height:* Theatres, cinemas, exhibition halls, retail markets and similar buildings, contain a larger volume in proportion to floor space than do the ordinary run of buildings. Under a Floor Space Index control alone, this fact might give developers of such buildings an advantage over other developers. Buildings of this kind would however be subject both to the daylighting control described in paras. 162-166 below, and, in most cases to special safety regulations concerning entrances and exits. For these reasons it may not be necessary to apply a lower Floor Space Index to sites which are to be used for such purposes, but the Planning Authority should bear in mind the limitations of the Floor Space Index when applied to these types of building.

(ii) *Buildings to which special siting conditions apply:* Special siting conditions are likely to apply to churches, university buildings, local government offices, civic halls and other public buildings and these buildings also differ greatly from one another in general form. For these reasons, as has been stated in para. 147, the Floor Space Index is not suitable for controlling the distribution of public buildings.

(iii) *Buildings or other developments that contain little floor space:* It may be necessary for land within the central area to be used for developments in which the amount of floor space in use has little relevance to the primary purpose or the size of the development, and the Floor Space Index cannot be used in connection with such developments. Examples of this kind of development include railway stations and yards, bus stations, timber yards, etc.

G. Daylighting Control

162. The Floor Space Index decided upon for a plot will control the total amount of floor space which can be provided on the plot, but it will leave the developer free to decide whether to build a relatively low building on most of his plot or a relatively high building on a portion of it. So far as is practicable this freedom should be preserved, since many developers will wish to erect buildings which have been designed to suit their special needs. The developer's freedom to arrange the permitted floor space on his plot in the manner which best suits him must, however, be subject to a control that will prevent a new building depriving any existing or future building on a neighbouring plot of its fair share of daylight.

163. The redevelopment plan should provide for the elimination of specially narrow streets, for the regrouping of street blocks into well-shaped units and for a new system of streets which will usually be wider than the streets they replace. But these improvements will not by themselves be enough to prevent one building obstructing the daylight of another building. The Ministry has therefore examined the ways by which such obstruction can be prevented. The examination has been made in collaboration with the Building Research Station of the Department of Scientific and Industrial Research.

164. The first need was for a standard by which to measure daylight in office buildings—taking these buildings as typical of those in central areas within which good daylighting is of great importance. Absolute units, such as foot-candles, are impracticable for daylight design because of the large and often rapid changes in the intensity of daylight. Daylight indoors has therefore been measured as a percentage of the total light available outdoors under an unobstructed sky, and the percentage of daylight is called the Daylight Factor. A Daylight Factor of 1 per cent. means that at the point of measurement the illumination is 1 per cent. of that which would have been obtained if from that point the whole hemisphere of the sky could have been seen. The standard recommended for offices is a Daylight Factor of 1 per cent at a distance of 12 feet from the external wall and at a height of 2 feet 9 inches above the floor. The aim has been to evolve a system of daylighting control which would provide this standard within all buildings that contained a normal number of windows of reasonable dimensions, and it is recommended that this standard should be applied in all zones in the central area.

165. The method evolved makes use of the fact that daylight may reach a window either from over the top of an obstruction in front of the window, or from one side of the obstruction. The basis of the method is somewhat complex and for reasons of space is not described in this handbook.*

*The basis and evolution of the method are described in items Nos. 1, 2 and 4 in the Bibliography.

The application of the method to particular buildings is, however, simple, and is described in *Appendix* 3. In brief, the application consists in testing the block plan of the proposed building by a small number of permissible height indicators. The block plan used for this purpose should have the heights of the various parts of the building marked on them, and if the proposed building passes these tests, it will not unreasonably obstruct the daylight of existing or future buildings on neighbouring sites.

166. This method of controlling the daylighting, or overshadowing, of buildings is likely to promote the more efficient and convenient layout of buildings and it is recommended that the method should be applied to land acquired by Planning Authorities for the redevelopment of central areas. Its application to other land is now under examination and will be the subject of a separate publication.

H. Control of External Appearance

167. The aims and scope of the control of the external appearance is considered in paras. 235-240. It should, however, be noted here that the density of building accommodation should be determined in the light of the considerations described above, including average pre-war density, probable future demand for accommodation, traffic needs and the desirability of avoiding a concentration of values on certain streets or sites. The Floor Space Indices of plots in particular positions—for example those fronting on a main street—should not be raised for the sake of any added architectural impressiveness that might be obtained by greater average height of buildings.

III. THE MAIN STREET LAYOUT

A. General Requirements

168. The most obvious pre-war defects of central areas were the inadequacy of their streets to carry the vehicular and pedestrian traffic which tried to use them. As has been stated previously, the future prosperity of the central areas of larger towns depends upon the solution of their traffic problems; and the provision in the plan for traffic circulation, including the waiting and parking of vehicles, must therefore be such as is likely to be sufficient for all vehicles and persons having business in the central area.

169. This provision will require decisions to be taken on a large number of matters, some general and some technical and detailed, which have been the subject of expert study during recent years. In particular, the recently published report of the Departmental Committee set up by the Ministry of War Transport, *The Design and Layout of Roads in Built-Up Areas* (H.M.S.O. 1946)—considers in detail the various matters affecting the efficient circulation of traffic in urban areas. Particular attention is drawn to the above report, and in considering in this handbook those aspects of street design which are specially relevant to the preparation of redevelopment plans for central areas, it has been assumed that Planning Authorities will have the above report—hereinafter referred to as *Roads in Built-Up Areas*—available for reference. In the following paragraphs, references to paragraphs of *Roads in Built-Up Areas* are given within square brackets, thus [ ].

170. The central area of most towns in this country is situated at the centre of a radial pattern of main roads, and pre-war traffic congestion and dangers in central areas may be said to have had the following main causes:—

(i) The passage through the central area of traffic which did not require to stop anywhere in the town, and of traffic which did not require to stop in the central area, in addition to traffic which had an origin or destination in the central area. [126-129, 159].

(ii) The inefficient layout of the streets from the point of view of traffic flow, and particularly the multiplicity of intersections. [255].

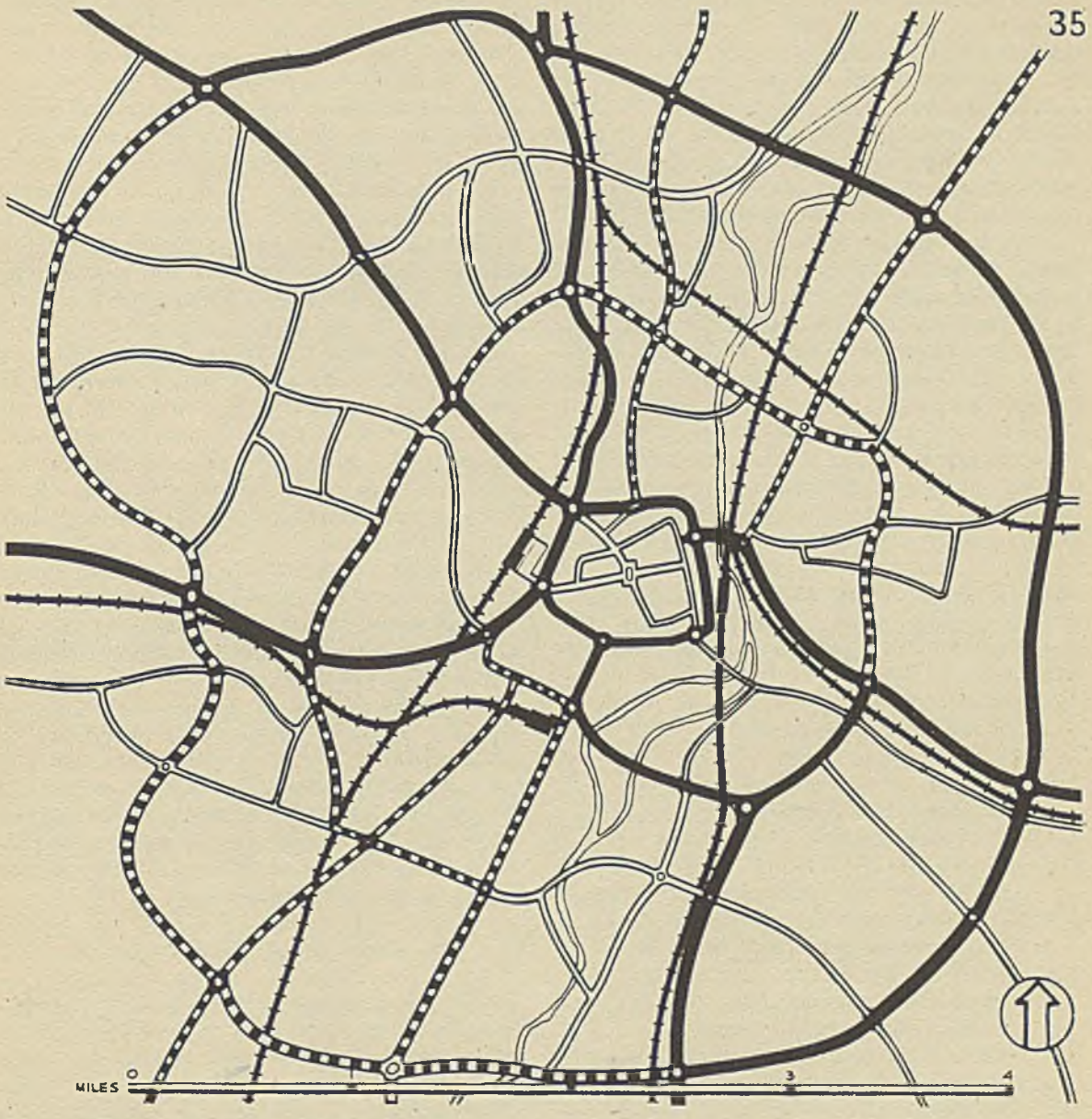
(iii) The confusion of building uses, which created and attracted mutually obstructive forms of both pedestrian and vehicular traffic, together with the use of roads for more than one purpose. [17, 180, 325].

(iv) The inadequacy of provision for the unloading, waiting and parking of vehicles. [397 *et seq*].

171. The layout of streets proposed in the plan should be such as will secure, to the greatest practicable extent, the achievement of the following aims:—

(i) The diversion from the central area of all traffic which has not an origin or destination within it. [146].

(ii) A division of roads into classes according to the nature of the traffic which they may be expected to carry. [6, 17].



THE TOWN AS A WHOLE *traffic function of roads in proposed network*

through road—main traffic flow *local through road*

(iii) A free flow of traffic, which will entail the elimination of all unnecessary intersections, the provision where necessary for waiting vehicles and the avoidance of conflicting traffic uses. [255, 397 *et seq.*]

(iv) Convenient circulation for pedestrians, particularly in shopping streets. [167, 246, 325-326].

(v) An adequate and well-distributed system of public car parks. [416 *et seq*].

(vi) The retention of existing streets where these can be suitably incorporated within an improved street layout, and the execution of proposed changes at a reasonable cost and by orderly stages.

172. Estimates of future traffic growth are

necessarily conjectural. It is stated in *Roads in Built-Up Areas* [51] that if vehicular traffic (excluding pedal cycles) increases after the war at the same rate as in the preceding ten years, it will rather more than double itself in 20 years, and it is therefore recommended by the Departmental Committee [52] that road systems in built-up areas should in general be designed to take more than double the pre-war volume of traffic.

173. In *Roads in Built-Up Areas*, the Departmental Committee of the Ministry of War Transport divided roads into five classes [5-6] according to the predominant traffic function of each class. These five classes and their definitions appear in the left-hand column in para. 174. For purposes of planning in a central area, however, it is sufficient to place roads within one or other of the three groups shown in the right-hand column, and this shorter classification is generally used in this handbook. The relationship between the three groups and the classification used by the Departmental Committee is shown in para. 174, and wherever it has been necessary to distinguish between different types of principal traffic road, the nomenclature in *Roads in Built-Up Areas* has been used.

174.

Arterial Roads Roads serving the country as a whole, or a region of the country, and linking up the main centres of population or the various regions.	Principal Traffic Roads
Through Roads Roads carrying traffic having its origin outside the town, and its destination inside the town, or vice versa.	Principal Traffic Roads
Local Through Roads Roads carrying traffic having its origin in one area of the town and its destination in another area.	Principal Traffic Roads
Local Roads All other roads in the town except development roads	Main Streets
Development Roads Roads the primary function of which is to provide frontage for the development of land	Minor Streets

B. Principal Traffic Roads outside the Central Area

175. Since the central area usually lies at the centre of a radial pattern of roads, the layout of roads in and near the central area must be considered, first of all, in terms of traffic flow and volume throughout the town and along roads converging upon it. The importance of information on the volume, origin and destination, type and characteristics of traffic has been mentioned in para. 65 and is emphasised in *Roads in Built-Up Areas* [35 *et seq.*]. Information of this kind is essential in order that the Planning Authority may be able to distinguish between traffic which requires to enter the central area and that which does not, and in order that each new road may be designed to suit the type of traffic which it is likely to carry.

176. In order to determine the main planning proposals for the town as a whole referred to in paras. 68-69 and shown in Fig. 25, it will be necessary for the Planning Authority to determine the routes of Arterial, Through and Local Through roads, including any Outer or Intermediate Ring Roads which may divert traffic from the inner areas of the town. Fig. 35 shows the Principal Traffic Roads which might be proposed for a town of about 250,000 inhabitants, distinguished according to their predominant traffic function. Arterial traffic should normally be deflected from the urban road system [140]. Fig. 36 shows the possible traffic density in 1960 as it might be distributed over the proposed road system, and may be compared with Figs. 12 and 13. Through and Local Through traffic which has its origin and destination outside the central area should be encouraged to avoid the central area by the provision of a convenient system of Ring Roads linking up the main radials.

C. The Inner Ring Road

177. The large volume of vehicular and pedestrian traffic which requires to circulate within a central area should not be swollen by traffic which is merely passing through, including traffic proceeding from a point near to one side of the central area to a similar point on the far side. It follows that it will be desirable in most towns for an Inner Ring Road to form the boundary of the central area. The function of the Inner Ring Road would both be that of an innermost diversion route for traffic which does not need to enter the central area, and the principal circulating route for vehicles seeking the most convenient point of access to the central area [146]. The town on which were based many of the preliminary studies for this handbook is one for which an Inner Ring Road of roughly circular form was found suitable. But it does not of course follow that this will be

36 **ROAD TRANSPORT 1960**

POSSIBLE TRAFFIC DENSITIES IN 1960. DAILY FLOW OF VEHICLES ON PROPOSED ROAD NETWORK

the case in all towns. Any connected system of roads which efficiently performs the functions of an Inner Ring Road may be used for that purpose. In many towns the most suitable system will not be circular and in others a complete inner ring may not be necessary. If the Inner Ring Road is to perform these important traffic functions properly, it will be necessary for frontage access to it to be restricted, and this is an additional reason for the Inner Ring Road being on the boundary of the central area rather than within it. [151-152].

178. It will therefore be seen that the choice of the most suitable line for the Inner Ring Road is of great consequence. In many towns the Inner Ring Road will run for part of its length through existing streets, and if these streets are already of commercial importance it will be very difficult to prevent both sides of the street remaining in use for purposes suited to a central area. Such a street would rarely form a true boundary to the central area or properly fulfil the traffic function of an Inner Ring Road. It is therefore recommended that only existing streets of minor commercial importance should be chosen to form part of the Inner Ring Road. The most suitable line for any new portions of the Inner Ring Road should be relatively easy to determine. Many existing central areas are partially surrounded by areas of obsolescent property or underdeveloped land, and the best line for the Inner Ring Road would often be on the inner margin of this fringe of obsolescent property.

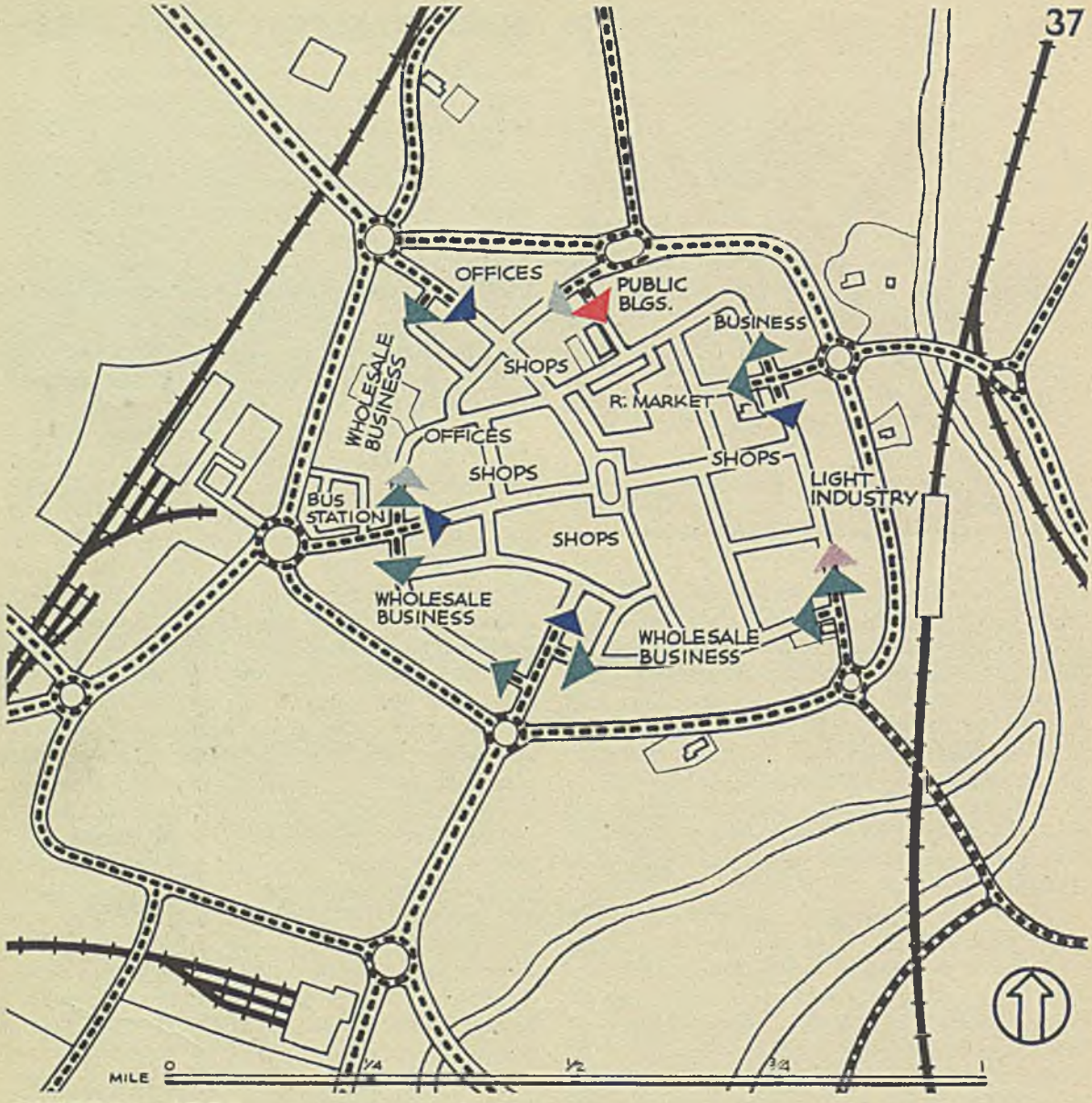
Public Service Vehicles

179. Careful attention should be given during the preparation of the plan to the question of whether public service vehicles should circulate within the central area.

180. The question is one of difficulty. In the first place, it has been maintained that the extent to which it will be possible to secure and maintain a balanced distribution of values in the central area, particularly in shopping streets, will be greatly influenced by the relative ease of access to the various premises from public service vehicles, and that the actual stopping places proposed for public service vehicles should be carefully scrutinised from the point of view of their probable effects on site values.* In the second place, passengers in public service vehicles may reasonably expect that they shall be as advantageously placed as the users of private cars in the matter of access to the central area. In addition, if public service vehicles are excluded from the central area, they will be present in considerable numbers on the Inner Ring Road, and, however well provided for, will tend in some degree to diminish the Ring Road's attraction as a central area by-pass for other types of vehicle. Against these arguments there must, however, be set others of some weight. Public service vehicles contribute to street congestion in central areas, and by screening other vehicles contribute to street accidents. Their routes and stopping places are under public control, whereas those of other vehicles are not. There is also some evidence that any route used by public service vehicles tends to become a main traffic route. If therefore, public service vehicles traverse the central area, through traffic will tend to do the same, instead of using the Inner Ring Road.

181. The best solution for a particular town will largely depend on the size of the central area. If all points within the central area lie within short walking distance of the Inner Ring Road, public service vehicles may be confined to the

*Ministry of Town and Country Planning, Estate Development and Management Problems in War-Damaged Areas. paras. 17-19.



CENTRAL AREA *proposed main street pattern showing access to use areas*

main traffic routes

shops

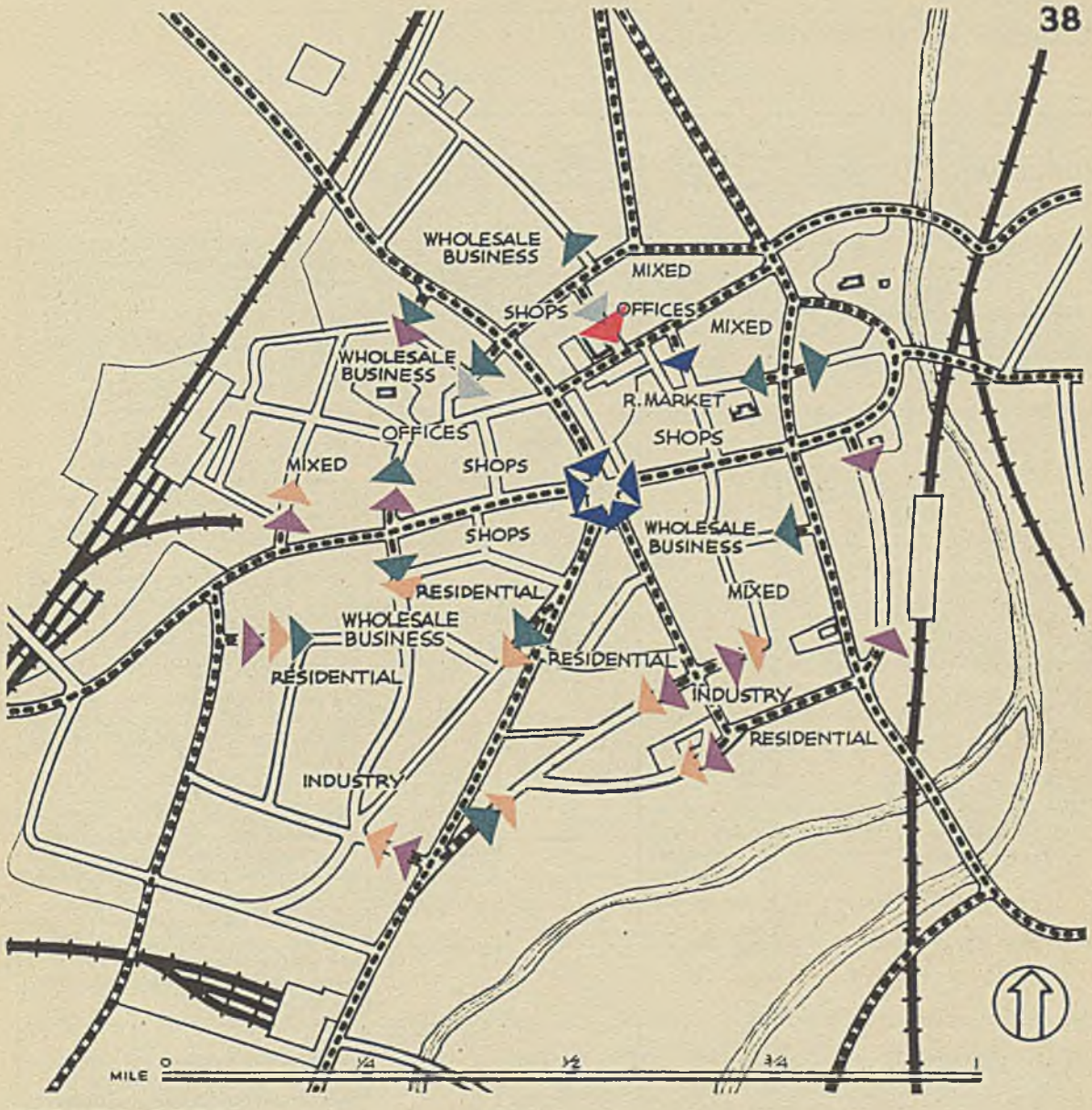
offices

educational, recreational and public buildings

wholesale business

light industry

Inner Ring Road, which would then become an almost continuous picking-up and setting-down circuit for them and would have to be provided with continuous waiting lanes for this purpose [147 and 150]. In larger towns a limited number of public service vehicles should be permitted to enter the central area, and call at one or more picking-up and setting-down stations within it. Roads leading to these stations should not form direct routes across the central area. [148] Whichever solution is adopted, the Planning Authority should have regard to the possibility of a change



SURVEY AREA *existing main street pattern showing access to use areas*

main traffic routes

shops

offices

educational, recreational and public buildings

wholesale business

industry

residential

of policy becoming necessary in later years, and the plan should contain provision for such a change.

182. In towns where it is decided to exclude public service vehicles from the central area special care will be necessary to prevent the settlement of high values on plots adjoining the Inner Ring Road, to the detriment of the rest of the central area. In particular, the Inner Ring Road should not be developed as a shopping centre.

1. Residential Neighbourhoods.

(Part 1, Residential Neighbourhoods, does not apply to Central Areas).

Type	Purpose	Minimum width of street.	Minimum width of carriageway	Minimum number of footways	Minimum width of each footway	Conditions
A	Main Street	66 ft.	22 ft.	2	9 ft. (12 ft. along shop frontage).	Waiting bays or lanes not less than 8 feet wide, 9 feet if intended for omnibuses, to be provided where necessary.
B	Principal Shopping Street	66 ft.	22 ft.	2	12 ft.	Waiting lanes not less than 8 feet wide, 9 feet if intended for omnibuses, to be provided where necessary.
C	Minor Street	—	16 ft.	2 (1 if access to property only on one side of street).	6 ft. (12 ft. along shop frontage).	Where street junctions are more than 500 feet apart, turning spaces to be provided where necessary. Waiting lanes may be required where there are shops.
D	Cul-de-sac.	—	16 ft.	1 (2 if access to property on both sides of street).	6 ft.	The closed end of the street shall not be more than 600 feet measured along the carriageway, from a street open at both ends.
E	Cul-de-sac.	25 ft.	13 ft. (9 ft. where there is no access to property).	1	6 ft.	No part of the carriageway shall be more than 150 feet, measured along the carriageway, from a street open at both ends.
F	Street bordering on an open space.	—	13 ft. (9 ft. where there is no access to property).	1	6 ft. (12 ft. along shop frontage).	Applicable only to streets intended to give access solely to buildings forming three sides of a quadrangle or arranged in some other similar manner so as to front on an open space. The street shall not be more than 500 feet long. Waiting bays to be provided where necessary. Waiting lanes may be required where there are shops.
G	Street to give access to back of premises for loading and unloading.	—	20 ft.	2 (1 if access to property only on one side of street).	6 ft.	Where street junctions are more than 500 feet apart turning spaces to be provided where necessary. This street may be a cul-de-sac.

No part of any street in a residential neighbourhood to be more than half a mile, measured along the carriageway from a main street.

NOTES:

All streets except those referred to in the schedule as culs-de-sac, shall be open at both ends.
Every cul-de-sac shall have a turning space at the closed end designed to the approval of the Planning Authority.
The part of a street not laid out as a carriageway, waiting bay, turning space or footway shall be laid out and paved or planted as required by the Planning Authority.

II. Principal Business Areas.

Type	Purpose	Minimum width of street	Minimum width of carriageway	Minimum number of footways	Minimum width of each footway	Conditions
H	Main Street.	74 ft.	44 ft.	2	15 ft.	Central refuges not less than 4 feet wide should be provided.
I	Principal Shopping Street.	74 ft.	44 ft.	2	15 ft.	Central refuges not less than 4 feet wide should be provided.
J	Minor Street.	54 ft.	30 ft.	2	9 ft. (12 ft. along shop frontage).	
K	Minor Street.	32 ft.	20 ft.	2	6 ft.	No part of the street to be more than 300 ft., measured along the carriageway, from a street of type I, J, or a main street.
L	Cul-de-sac.	32 ft.	20 ft.	2	6 ft.	
M	Street to give access to back of premises for loading and unloading.	—	20 ft.	2 (1 if access to property only on one side of street).	6 ft.	Where street junctions are more than 500 ft. apart, turning spaces to be provided where necessary. This street may be a cul-de-sac.

No part of any street in a principal business area to be more than a quarter of a mile, measured along the carriageway, from a main street.

III. Industrial Areas.

N	Main Street.	64 ft.	—	2	—	The width of the carriageway and of the footways to be fixed by the Planning Authority to suit the particular circumstances.
O	Minor Street.	40 ft.	—	—	—	
P	Cul-de-sac.	40 ft.	—	—	—	Ditto. The closed end of the street shall not be more than 220 ft. measured along the carriageway from a street open at both ends.

No part of any street in an industrial area to be more than half a mile, measured along the carriageway, from a main street.

IV. Footways.

Q	Footway.	6 ft.	—	—	6 ft.	The footway shall not be used as the principal means of access to any building which is more than 200 ft. from a carriageway.
R	Pedestrian way lined with shops.	20 ft.	—	—	20 ft.	

Service roads should be of one of the specified types, as may be appropriate.

Sight lines at road intersections are shown in Figs. 49-51. All the land in front of the sight lines should be included in the streets.

At the junction of two minor streets and at the junction of a minor street with a main street the radius of the kerb line to be not less than 15 ft. At the junction of two main streets the radius of the kerb line to be not less than 35 ft.

[152] It will therefore be necessary to give special attention to the nature and siting of development adjoining the Inner Ring Road. In some cases, land adjoining the Inner Ring Road may be used for car parks or open spaces, and as far as possible access to all buildings fronting on the road should be gained from within the central area.

183. It will usually be desirable for the station or stations for longer distance buses to be located in the central area, preferably adjoining the Inner Ring Road and conveniently near the railway station. A single station for these buses has advantages, and in any case it is desirable that the number of bus stations should be as few as is practicable.

D. Intersections on the Inner Ring Road

184. Intersections on the Inner Ring Road should be designed to deflect non-stopping traffic from the central area, to maintain free flow on the Road and to provide for safe and convenient movement of vehicular and pedestrian traffic between the central area and the rest of the town. [153] These intersections will therefore require careful consideration both as to number and design.

185. In general, the intersections of the radial routes converging on the central area and the Inner Ring should be laid out as roundabouts, that will both enable traffic to enter and circulate on the Inner Ring Road, and effectively break the continuity of traffic movement on the radial inwards towards the central area [154]. The portions of the main existing radials which lie within the proposed central area are probably main shopping streets and the plan may propose that they should continue to be so used. If public service vehicles circulate through these streets, after passing around the new roundabouts on the Inner Ring Road, they may tend to draw local through traffic after them. It is therefore suggested that the circulation of public service vehicles on existing radials within the central area should be kept to a minimum and an endeavour be made by suitable design and layout to induce traffic to use the Inner Ring Road.

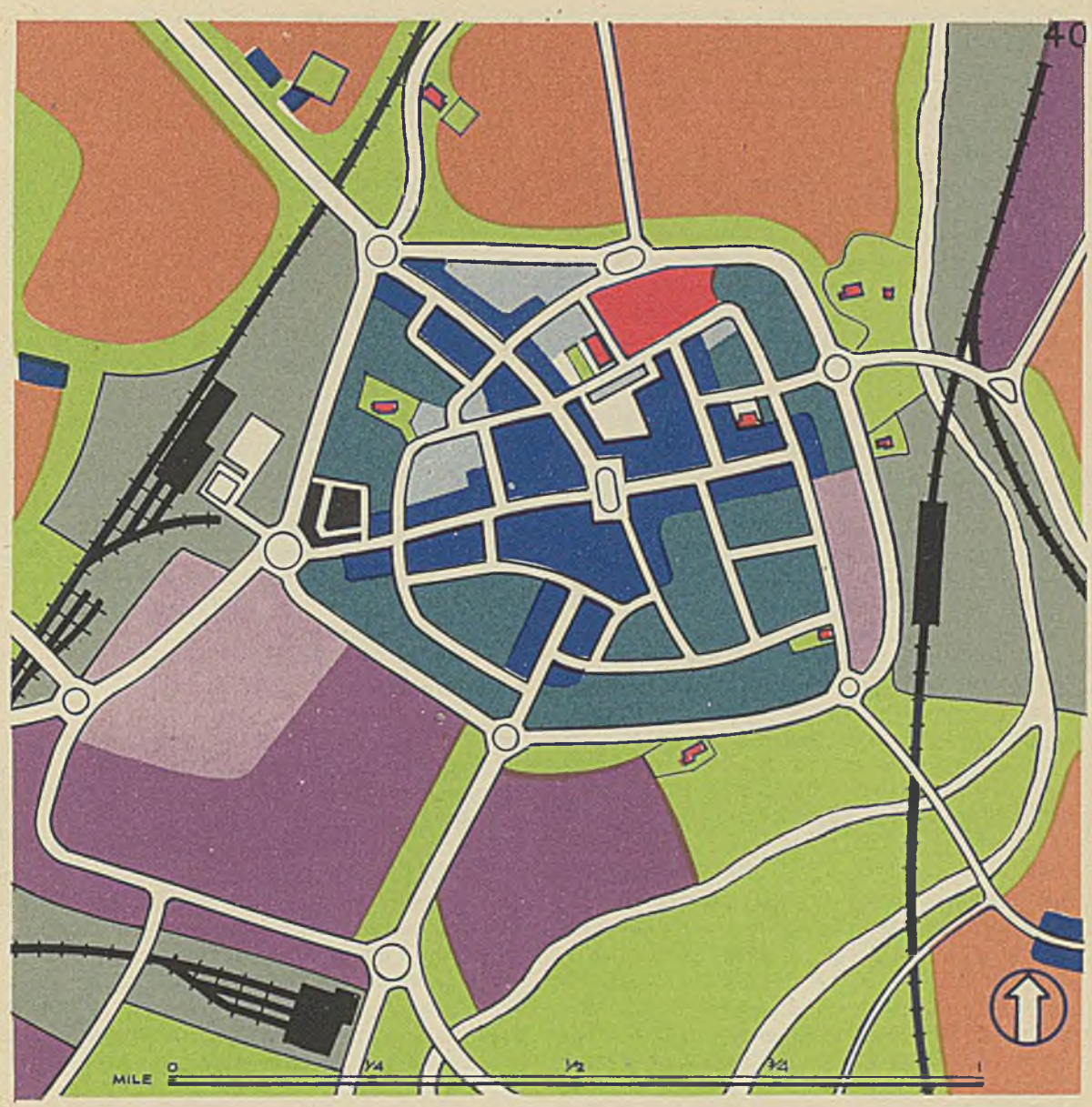
186. The number of junctions between central area streets and the Inner Ring Road should be few, minor streets being barred to vehicular traffic before they enter the Ring Road. Where the junctions of radials with the Inner Ring Road are numerous, free-flow on the Ring Road might be impeded by a multiplicity of level roundabouts, and a two-level layout may in some cases be necessary [156].

E. Main Streets

187. Main streets in the central area are those which serve as main distributive routes for traffic between one part of the central area and another.

188. The future prosperity of the central area will depend in large measure upon its attraction as a shopping centre, and special attention should therefore be given to the traffic requirements and the layout of the principal shopping streets. The requirements of a successful shopping centre include continuous shop front displays along both sides of streets of reasonable length and not too great a width, ample provision for pedestrian traffic, and provision for cars to wait for short periods outside shops. [165] These requirements cannot be fulfilled in streets which are both shopping streets and major traffic routes, and it is therefore of great importance that non-stopping traffic should be diverted from the central area by provision of an Inner Ring Road and the other measures described in preceding paragraphs. In nearly all central areas, however, some of the main streets will be principal shopping streets, and the latter will therefore be used to some extent by mixed traffic. But if the main street system has been carefully considered in relation to the various zones and intersections with the Inner Ring Road, the majority of traffic attracted to principal shopping streets is likely to be shopping traffic. For example, the intersections between main streets and the Inner Ring Road may be so located that each roundabout offers a convenient approach to a particular area of main use, such as offices, light industry or retail markets. (See Fig. 37 and compare it with Fig. 38).

189. It will be necessary for the Planning Authority to weigh the advantages and disadvantages of retaining existing main streets as part of the proposed main street system. In many towns, and particularly in those built on hilly ground the existing main streets are very well sited, in that they follow the easiest line from one focal point of the town to another. Such streets also contain services which would be a costly and lengthy process to replace, and have well-consolidated foundations. Thirdly, existing main streets are usually flanked by valuable buildings and are closely bound up with established centres of particular activities that will be of great importance to the life of the town during the reconstruction period, and therefore should not be removed or disturbed without strong reason. On the other hand, existing main streets are sometimes too narrow for modern needs and frequently make



CENTRAL AREA *proposed main use zones*

- *shops*
- *offices*
- *educational, recreational and public buildings*
- *wholesale business*
- *light industry*
- *industry*
- *railway land*
- *residential*
- *open space*

awkward intersections with one another. This is particularly the case near the point of confluence of the various radials. The fact that existing main streets may traverse the central area and may be flanked by shops throughout their length, may also prove a disadvantage from the point of view of their retention within the proposed main street system.

190. The advantages of retaining most of the existing main streets will usually outweigh the disadvantages. In deciding the proposed main street layout, the Planning Authority is therefore recommended to take the existing main street pattern as a basis. At certain points, extensive alterations in the existing pattern will be necessary; for example, near the place of confluence of the radials, and along the line of the Inner Ring Road. The construction of new and the widening of some existing main streets will also be necessary, but in general it is suggested that the main street system proposed in the redevelopment plan should comprise a thorough improvement and opening up of the old system, rather than a completely new system which pays little regard to the lines of the old streets. It may be expected that the new streets will run for the most part through portions of the central area which were formerly underdeveloped or occupied by obsolescent buildings, and the location of bus stations, stopping places and car parks may be used to draw an appropriate amount of traffic on to the new streets from the old streets and to diminish any tendency for values to remain concentrated on sites fronting on old streets. Recommended minimum widths for new streets are set out in Fig. 39, and further consideration is given to the design and layout of streets in paras. 197-206 below.

F. Minor Streets

191. The main function of minor streets in the proposed central area will be to provide a means of access to buildings and other premises.

192. Changes in the number and layout of minor streets can almost always be carried out far more easily than changes which affect main streets, in that both the services which minor streets contain and adjoining buildings are less valuable. In addition the need for changes in the minor street pattern will usually be greater. In most central areas minor streets are frequently awkwardly aligned, too narrow and too numerous, and the multiplicity of their intersections with main streets is the cause of many street accidents. [25].

193. It is therefore suggested that full use should be made during the preparation of the plan of advantages which may be obtained by changes in the layout of minor streets. Some of these streets may be widened into main streets, and well-shaped street blocks may be obtained for redevelopment by the elimination of others. Minor streets may also be closed at one end to become secondary access roads to shops, or, by being closed to vehicular traffic, they may be turned into pedestrian ways. These latter solutions may be specially suitable where an old minor street contains buildings of architectural or historic interest, which might have to be demolished if a large scale improvement were carried out or would at least lose much of their character by a change of setting. The layout of minor streets is further considered in paras. 197-206 below.

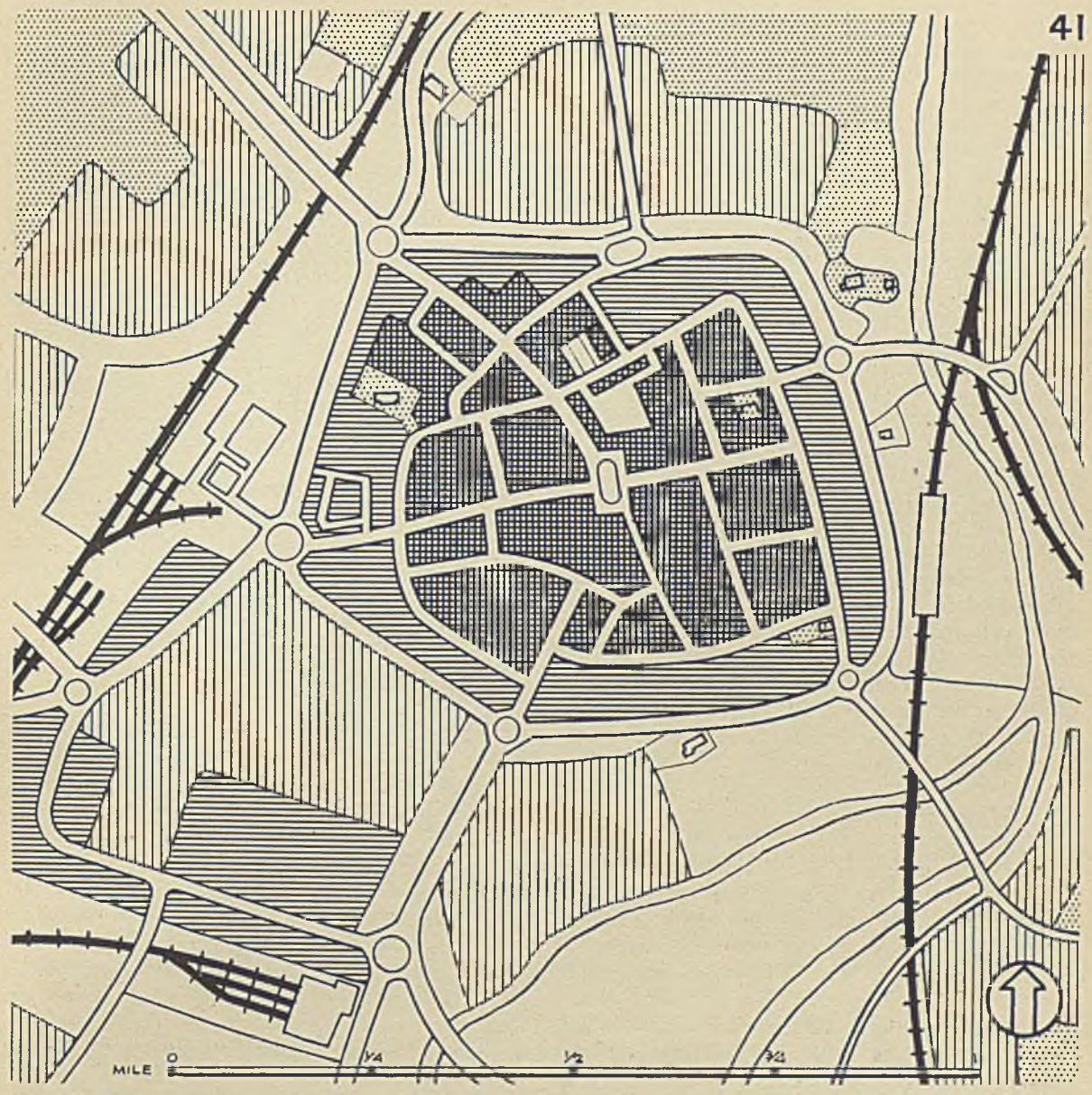
G. Car Parks

194. There should be generous provision for car parking within the central area, and a well-distributed system of smaller car parks is preferable to a few large ones [418]. In larger towns, consideration should be given to the provision for car parking in buildings, and beneath squares or other open spaces, as well as at ground level. Some car parks may be located on sites adjoining the Inner Ring Road. Elsewhere in the central area it will generally be preferable for car parks not to have direct access to main streets, although some of them should be visible therefrom. The design and layout of car parks is further considered in paras. 207-215.

IV. SKETCH PLAN FOR THE CENTRAL AREA

195. In the three preceding parts of this Chapter, the three chief problems involved in the preparation of a redevelopment plan—uses and use zones, the density of accommodation, and the main street layout—have for the most part been considered separately. In the actual process of preparing a redevelopment plan for a central area, these problems would of course be considered together, since the solutions to all three are interdependent. In addition, each more important proposal must be compared with the maps showing war damage and probable life of buildings, in order to ensure that the plan can be executed in orderly stages and at reasonable cost.

196. The decisions reached when account has been taken of the various matters mentioned in this Chapter will enable the Planning Authority to prepare a sketch plan of the proposed central area. The range and detail of the matters on which



CENTRAL AREA *proposed density of building accommodation*

F.S.I. up to .8

.8 *up to* 1.2

1.2 *up to* 1.6

1.6 *up to* 2.0

decisions should be taken at this stage is indicated in the following illustrations: Fig. 20 shows predominant uses in the central area in 1939 and Fig. 40 shows the use zones proposed in the plan. Similarly, Figs. 21 and 41 show 1939, and proposed densities of building accommodation in the central area, and Figs. 38 and 37 show 1939, and proposed layout of major streets.

Chapter 4: Layout and Development

I. STREET LAYOUT

197. If an Inner Ring Road is provided it will form part of the system of principal traffic roads for the town, none of which should pass through the central area. All streets within the central area will be either main streets or minor streets (see Table in para. 174). No minor street should lead directly into a principal traffic road.

198. A single comprehensive Schedule has been prepared to show the minimum widths desirable for different classes of street. This Schedule, reproduced in Fig. 39, is divided into four parts:—

I. Residential Areas. III. Industrial Areas.
II. Principal Business Areas. IV. Footways.

199. The last three parts of the Schedule apply to central areas. All zones in the central area will be covered by Part II of the Schedule except the light industrial zone to which Part III will apply. It should be noted that the Schedule is intended as a guide to minimum widths. It is not intended that these minimum widths should become standard widths. The width of a street should be determined by the vehicular and pedestrian traffic which it is likely to carry, and this may require certain streets in the central area to be wider than the minima laid down in the Schedule.

200. No part of a minor street should be more than a quarter of a mile, measured along the carriageway, from a main street. The width of the carriageway of streets of Types H and I comprises two lanes for waiting vehicles each 9 feet wide, two traffic lanes each 11 feet wide, and a reservation 4 feet wide in the centre for pedestrian refuges. The widths of the carriageways of minor streets in Part II of the Schedule are based on the assumption that suitable provision for loading and unloading is provided within the curtilages of larger premises fronting the street, and that extensive loading and unloading will not take place in the street itself. Streets of Types K and L are not intended for shops.

201. The requirements of different industrial areas are so varied that the minimum width of street only has been specified. The allocation of this width between carriageways and footways should be decided according to the requirements of the particular street. [182].

202. All streets, other than those referred to in the Schedule as culs-de-sac, should be open at both ends, and all culs-de-sac should have a turning space at the closed end. Sight lines and radii of kerb lines at junctions and intersections should be in accordance with the recommendations in *Roads in Built-Up Areas* [254-283, and especially 276-277].

203. Specimen plans, showing the minimum widths recommended for different types of street in the central area, are given in Figs. 42-47 and four different types of street intersection are shown in Figs. 48-51.

204. In preparing the street layout plan, the Planning Authority should consider the introduction of a suitable number of pedestrian ways. These should be located so as to provide short-cuts from one main street to another, or from bus-stations, car parks or open spaces to main streets. [206-207]. A proportion of the pedestrian ways might with advantage be located and laid out for development with shops. [166]. If placed between two main streets or otherwise located on a route likely to attract pedestrians, the freedom from traffic dangers which such shopping ways would enjoy seems likely to make them popular, and they would also assist in encouraging the development of the main shopping area in depth, as opposed to the linear development along a few main streets which has hitherto been customary in central areas.

205. Provision for street lighting in the central area should be in accordance with the recommendations contained in the report of the Ministry of Transport's Departmental Committee on Street Lighting (H.M.S.O. 1937).

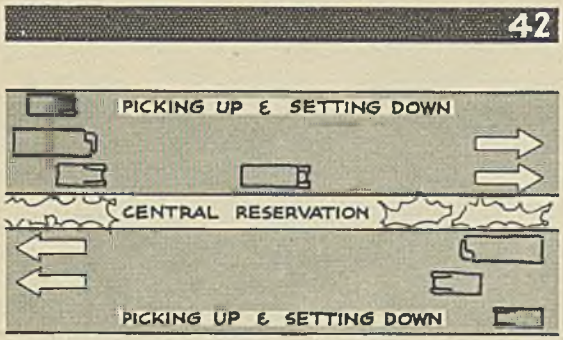
206. Special attention should be given to location and design of all street furniture and equipment, including street name plates. Planning Authorities should be guided in this matter by the recommendations in *Roads in Built-Up Areas* [368-396].

II. CAR PARKS

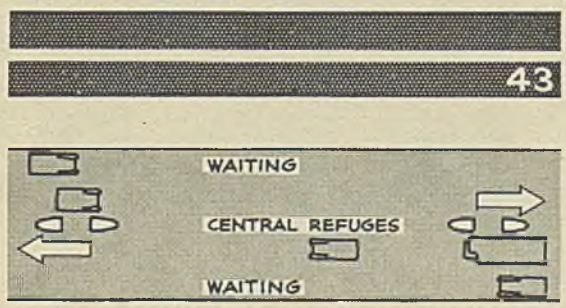
207. Liberal provision should be made for car parking in all central areas. Fig. 52 shows that the area in use for car parking in and near the downtown business area of Los Angeles in 1941

THE DESIGN OF STREETS

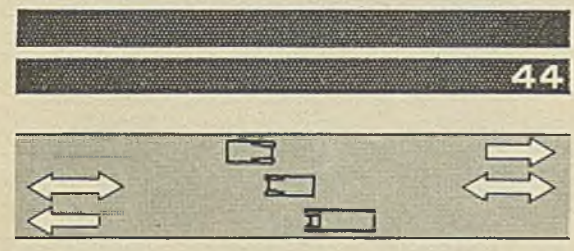
figured dimensions are proposed minimum widths of streets



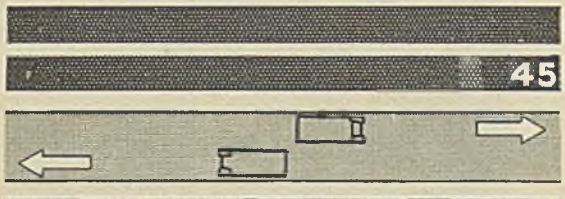
INNER RING ROAD



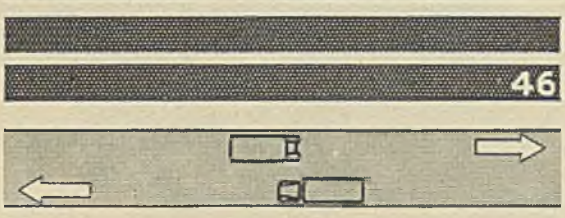
MAIN SHOPPING STREET
(74 FEET)



MINOR STREET
(54 FEET)



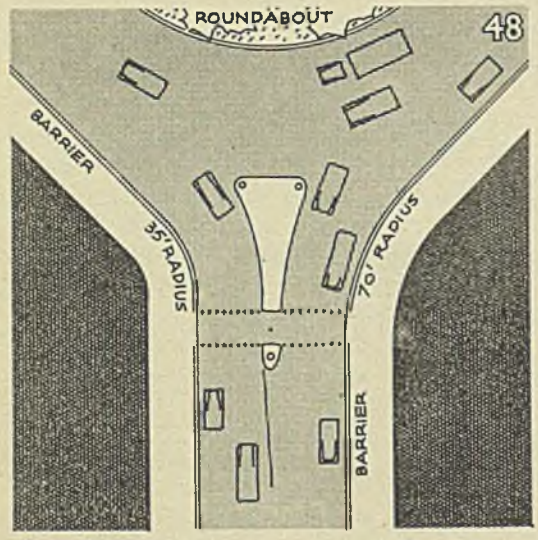
MINOR STREET & BACK ACCESS
(32 FEET)



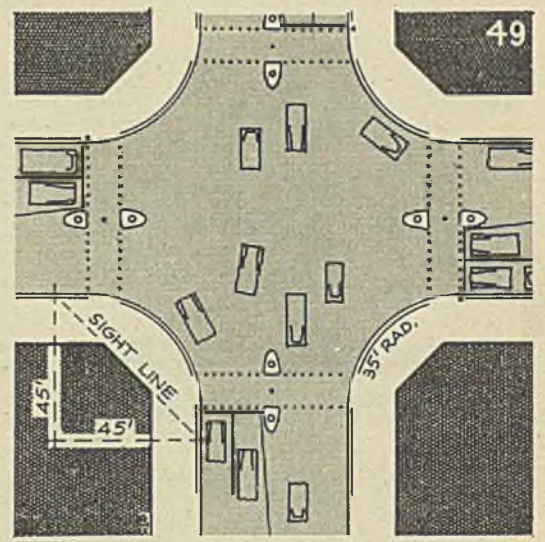
MINOR STREET (INDUSTRIAL AREA)
(40 FEET)

PEDESTRIAN WAY
(20 FEET)

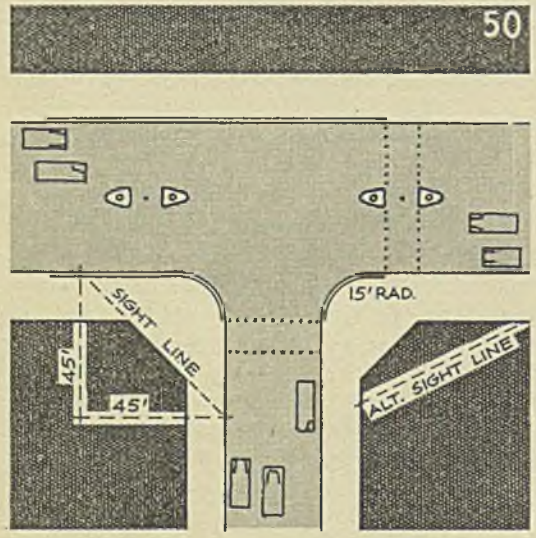
STREET INTERSECTIONS



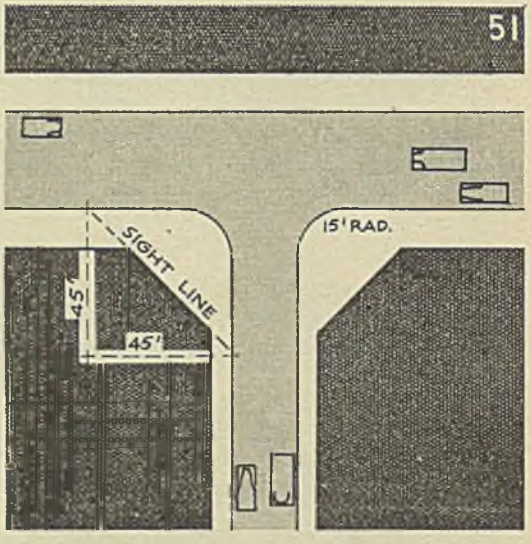
INNER RING—SHOPPING STREET



TWO SHOPPING STREETS

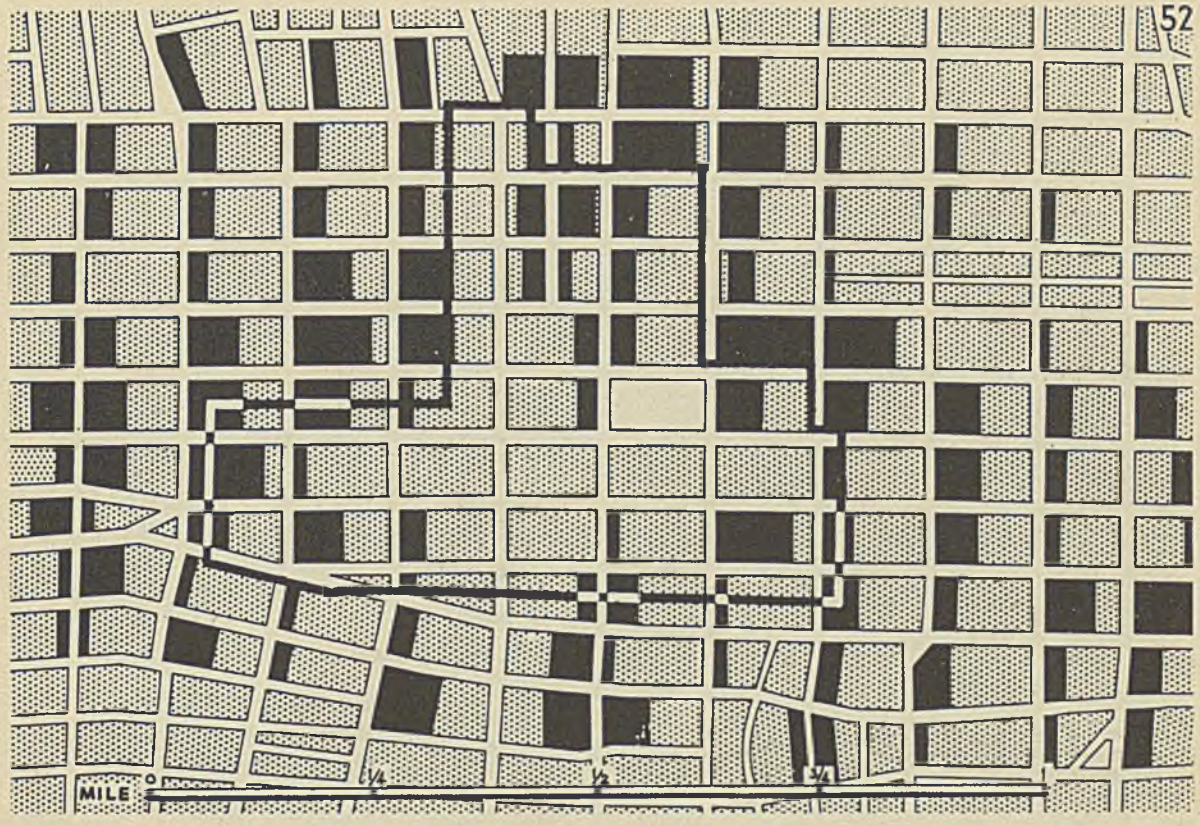


SHOPPING STREET—MINOR STREET



MINOR STREET—BACK ACCESS STREET

was equivalent to about one fifth of the total land area; and this allocation was described as sufficient to meet demand but in no way excessive. Conditions in Los Angeles are somewhat special, even in relation to other American cities, but the illustration does emphasize the likelihood of a great increase in demand for car parking facilities in British towns. It is suggested that provision should be made for a demand at least twice that which existed in 1939 when account has been taken of the capacity, location and use made of pre-war parking facilities, and the extent to which parking and waiting in streets was permitted. It should be assumed that waiting in waiting lanes will be limited to 10-20 minutes, and that where there are no waiting lanes vehicles



PARKING STUDY *space used for parking in relation to total land area in and near the centre of Los Angeles in 1941. The central business area is bounded by a heavy line*

parking area for 200 cars

will only be permitted to stop for long enough to set down and pick up. [*Roads in Built-Up Areas*, 404-406].

208. Provision for car parking may be supplied in three ways:—

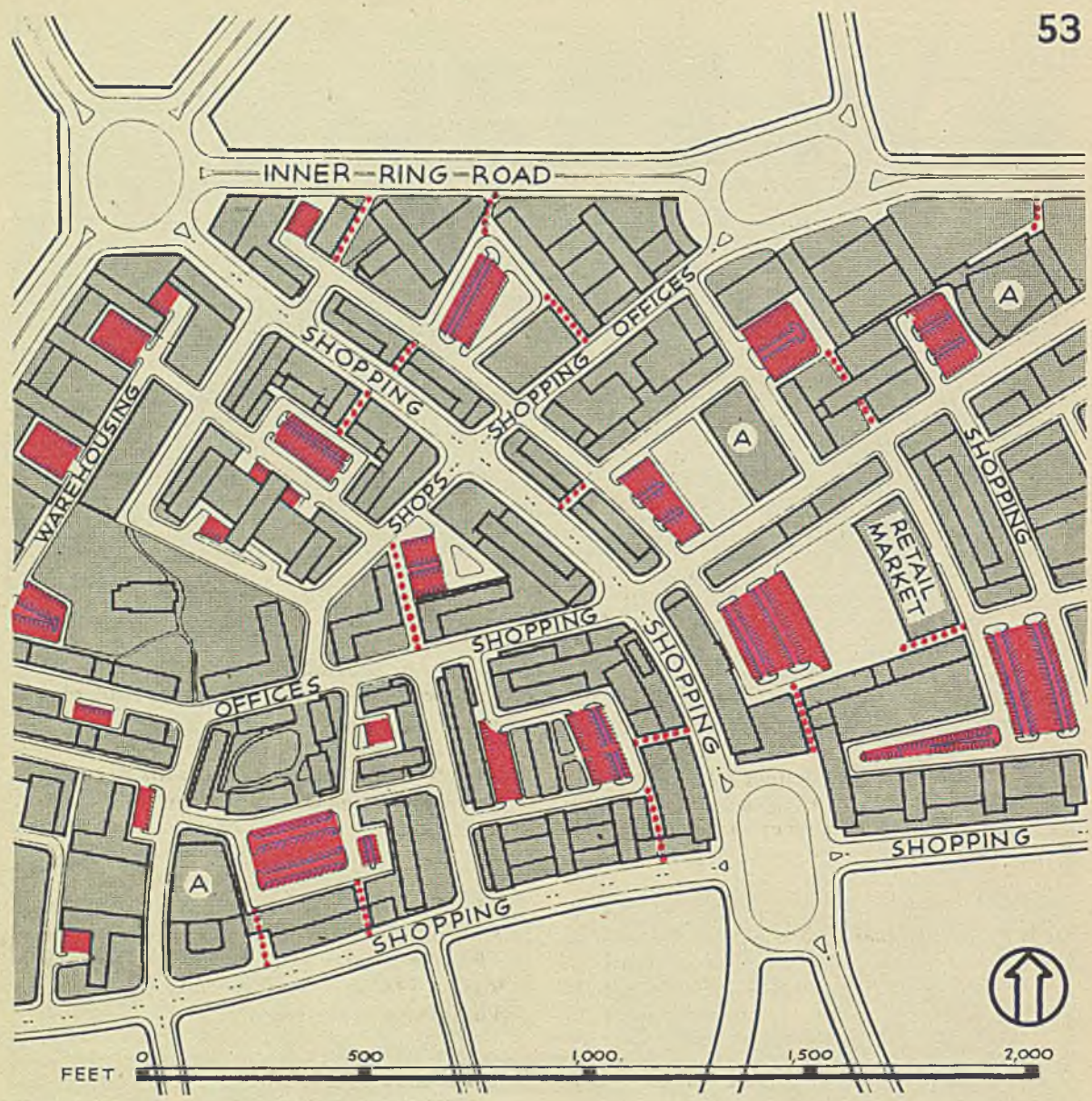
(i) By private developers within site boundaries, as ancillary to other development. Provision of this kind is an attraction to patrons and tenants of shops, office buildings and places of assembly, and developers of large buildings will no doubt seek to provide some facilities.

(ii) By private enterprise.

(iii) By the Local Authority.

209. It is recommended that the Local Authority should make available within public car parks sufficient space to meet the whole of the probable demand. This is especially desirable in shopping areas, where the nature of the development is likely to prevent the majority of developers from making provision within the boundaries of their sites. Twenty parking spaces for each 100 feet of main shopping frontage may prove to be needed. [413]. If in the course of time the provision of public car parks proves to be excessive a few of them can be released for other forms of development. On the other hand, if adequate provision is not made in the plan it will later prove impracticable to prevent parking in streets—the form of provision which is most expensive for the public in general.

210. The distribution of car parks should be carefully considered. Drivers wish to park as near their destinations as is possible. For this reason a greater number of small car parks is preferable to a few large ones, and the car parks should be located in positions likely to encourage their equal use [418]. In particular, there should be adequate provision in the main shopping area and near offices and retail markets. Normally, car parks should adjoin minor rather than main streets, so that traffic flow along the latter is not interrupted by cars pulling in and out of parks. Fig. 53 shows a possible distribution of car parks in a portion of a redeveloped central area, in



PART OF CENTRAL AREA *distribution of car parks*

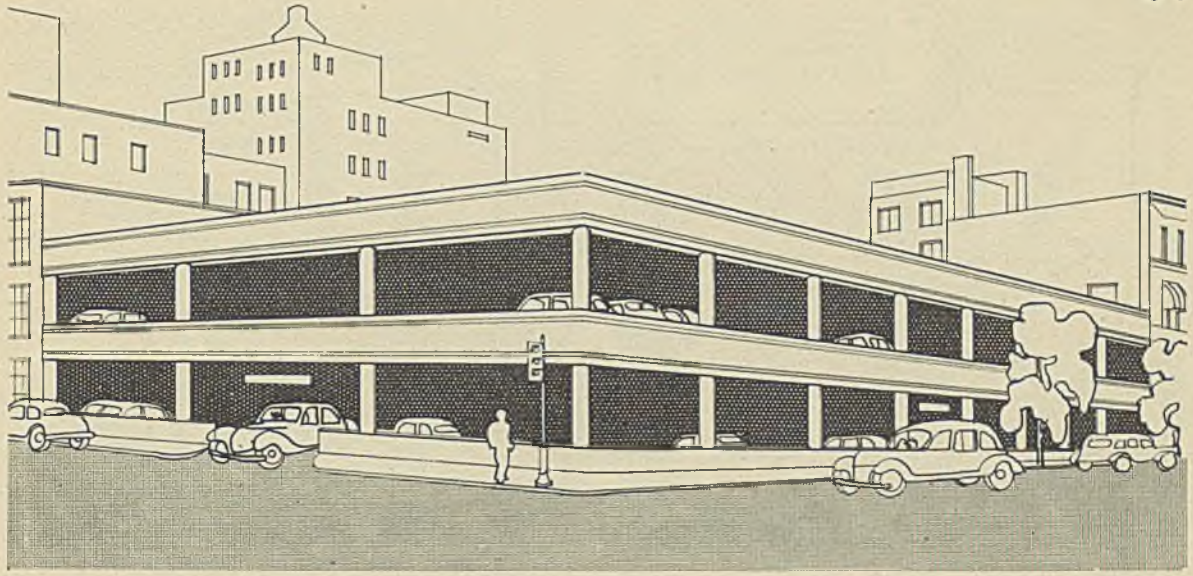
car parks *pedestrian ways* A—*places of assembly*

relation to the Inner Ring Road and main and minor Streets.

211. In larger towns the provision of adequate facilities by means of surface car parks is likely to prove difficult. In these towns consideration should be given to the provision of car parks below ground level, or in multi-storeyed buildings. The "open wall" multi-storeyed car park (see Fig. 54), appears likely to prove economical, and other possibilities are the mechanical type of car park [425] and car parks on roofs or below open spaces.

212. About 200 sq. ft. will be needed for each car in non-mechanical types of car park. Easy access to and exit from public car parks encourages their use for short periods, and it may prove uneconomical to provide car parks with a capacity of less than 20-30 cars. One commercial organisation has found that open car parks at ground level with a capacity of 100 to 150 cars give the best

54



AN "OPEN WALL" CAR PARK IN THE U.S.A.

economic return. The provision or absence of a paid attendant will also affect the economical size of car parks. Car parks may conveniently be combined with service stations and public conveniences, and by judicious planting with grass strips, shrubs and trees, can be designed to enhance the amenities and effect of openness of the neighbourhood. Four alternative layouts for surface car parks are suggested in Figs. 55-58.

213. It is desirable that all developers should be encouraged to make provision for the parking of cars within the curtilages of their premises. In order to encourage such provision it is suggested that the Planning Authority, in considering whether a proposed new building complies with the Floor Space Index applicable to its proposed site, should disregard all floor space below ground level that will be used solely for the parking of cars.

214. Provision should be made for the parking of pedal cycles under cover in all towns where cycles are much used. Part of a car park may be used for this purpose, or provision may be made in the forecourts of buildings or in open spaces. [430].

215. The attention of Planning Authorities is drawn to the Ministry of Transport's *Memorandum on Parking Places* (Memorandum No. 597. H.M.S.O. 1946)—and other publications on car parking in the Bibliography.

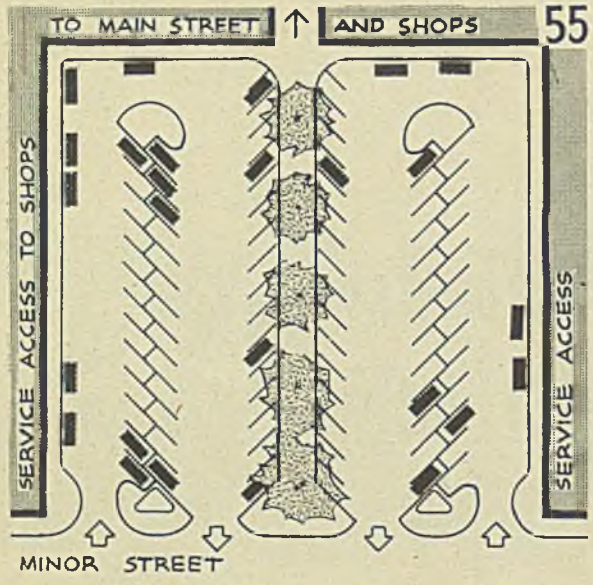
III. THE LAYOUT OF STREET BLOCKS

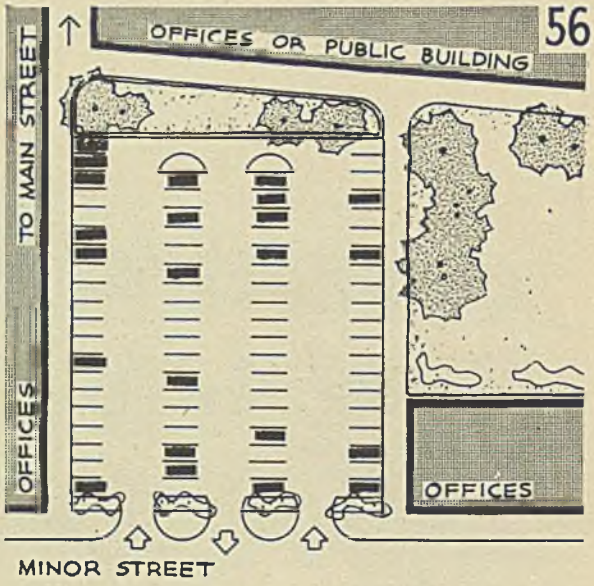
216. In preparing layout plans for redevelopment, Planning Authorities should try to ensure that the proposed new street blocks are of good shape and not too small in size. This will require, as has been mentioned in paras. 189-193, the introduction of some new streets and the elimination of some existing streets or the re-alignment of portions of them.

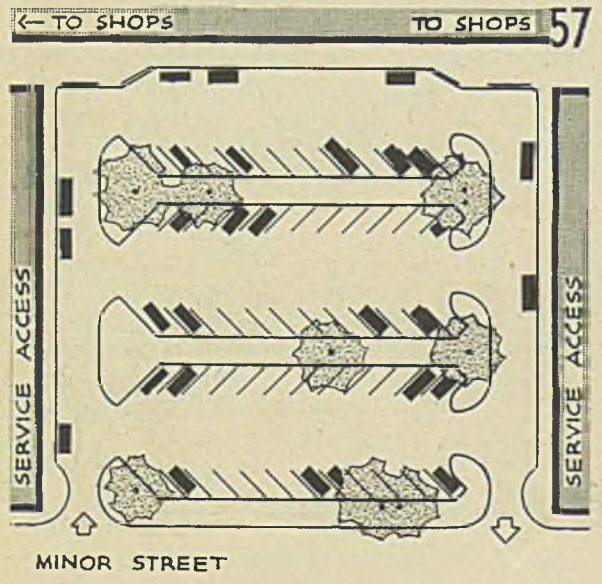
217. No standard sizes that will be generally applicable can be laid down for street blocks, but a smooth traffic flow requires that the number of street intersections should be the minimum which will enable convenient access to be obtained to all premises. It follows that in nearly all central areas the redevelopment plan could with advantage propose the amalgamation of many existing street blocks to form better shaped units of larger size. The provision within a single street block of a variety of differently sized and shaped plots to meet the varying needs of developers is a simple matter if the street block is of regular shape and adequate size. Conversely, it is difficult to do this within a cramped or awkwardly shaped street block. Street blocks, particularly in the shopping zone, should be of varying depth.

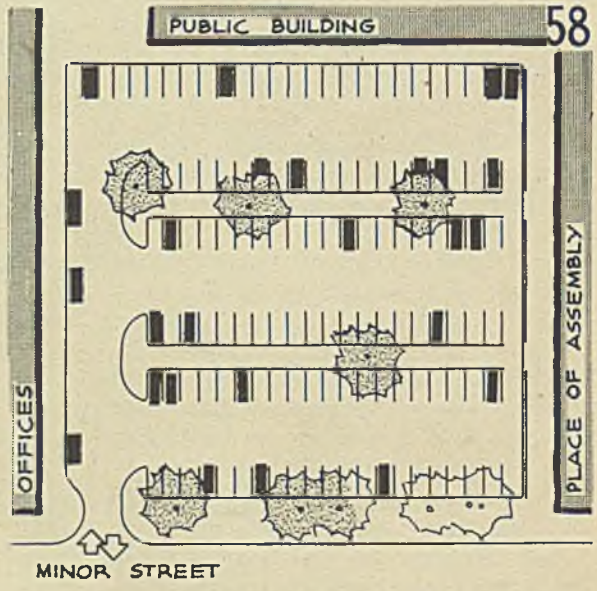
218. Fig. 59 shows proposed streets within a portion of a central area superimposed on the existing street pattern. The existing street inter-

LAYOUT OF CAR PARKS



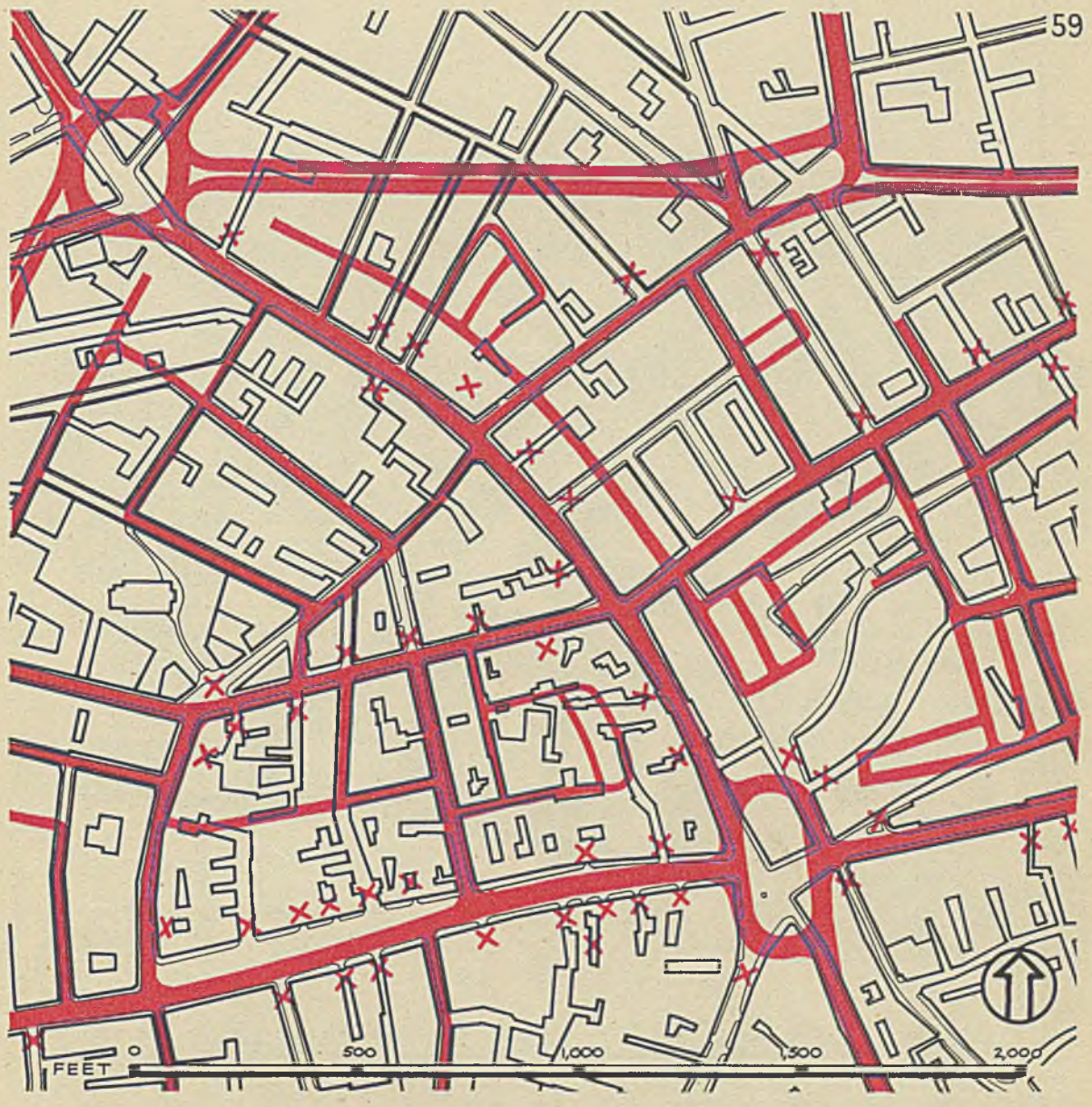






sections which it is proposed to eliminate are indicated by crosses. It will be seen that the main framework of existing streets has been retained, and that a smaller number of larger and, in the main, regularly shaped street blocks has been secured. Fig. 33 shows the 1939 layout and densities within the same portion of the central area and Fig. 34 the proposed regrouping into larger street blocks. Fig. 60 shows the area as it might be finally redeveloped.

219. In preparing a layout plan for a street block, it should be borne in mind that the block should be capable of subdivision in a number of different ways. It will probably prove desirable during the course of development to depart to some extent from the provisional layout plan in order to cater for the needs of individual developers, providing that the general layout requirements of the zone and the Floor Space Index for the street block are adhered to. The Planning Authority should not seek to impose on developers a rigid idea of the form which the layout within the street block should take. In disposing of each plot within the street block, it is necessary to ensure



PART OF CENTRAL AREA *comparison of existing and proposed street patterns*

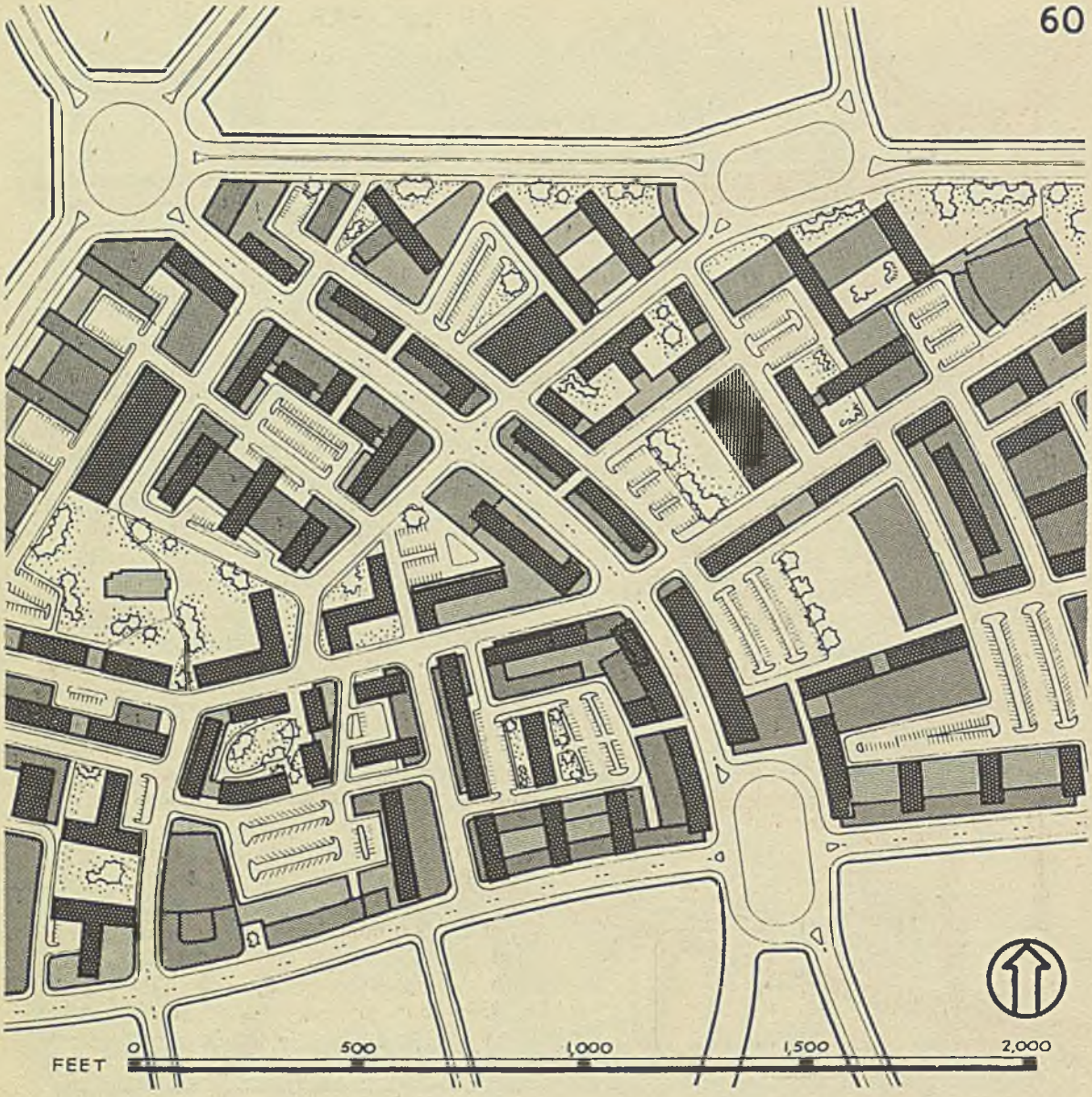
proposed carriageways *closure of existing vehicular access to main streets*

that the remaining land will form one or more convenient building plots.

Shopping Development

220. Street blocks in a shopping zone may be arranged in a number of ways to provide convenient sites for shops, and it is desirable that the layout plan should clearly distinguish between streets intended for shopping frontages and those to be used for service access.

221. Fig. 61 shows a possible layout for a street block surrounded by shopping streets of which two are major and two are minor. Main displays and entrances would be on the major streets. Development running the full depth of the block from one major shopping street to the other is not

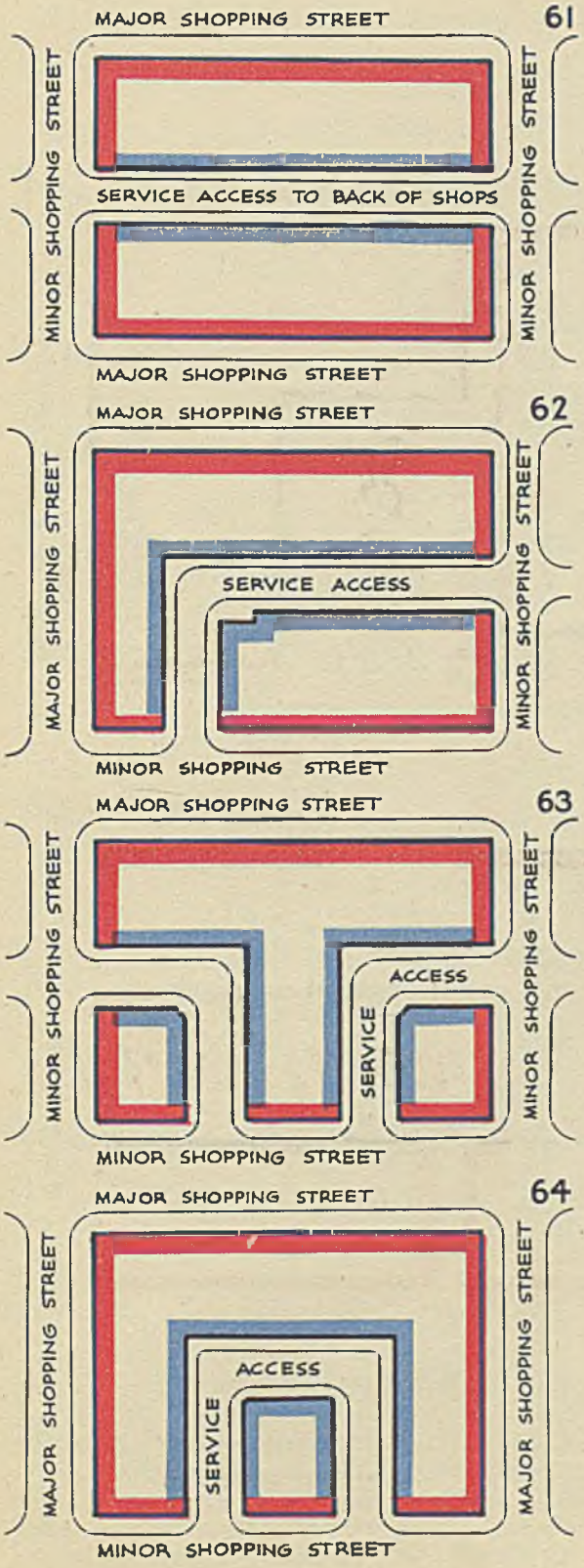


PART OF CENTRAL AREA *conjectural redevelopment of area shown in Fig.* 33

average F.S.I. for area—1.65

provided for in this layout. Fig. 62 illustrates a layout suitable for a position where two major shopping streets intersect. The layouts shown in Figs. 63 and 64 are suitable for street blocks surrounded respectively by one major and three minor, and three major and one minor, shopping streets. It will be seen that in all four layouts uninterrupted shop front displays have been provided along the full length of the frontages on major shopping streets. Within these layouts and simple variations of them, it is possible to provide a great variety of shapes and sizes of plots for development. (See Figs. 71-72).

222. Figs. 65-66, 67-68 and 69-70 illustrate in greater detail possible layouts for street blocks in the shopping areas of large, medium and small towns. Frontages intended for public access and display have been distinguished from those mainly intended for service access. It is suggested that some provision should be made for car parking



SHOPPING BLOCKS

shop frontage and public access
service access at back of shops

within the majority of street blocks. This provision has been further considered in paras. 207-215 above.

223. Figs. 71 and 72 show the variety of shape and size of plot which can be provided within a street block of uniform depth. In both drawings an average plot of regular shape and running the full depth of the block is shown on the left, and the areas of all other plots are shown as fractions or multiples of the average plot. Plots as small as 1/6th of the average plot, or as large as 2½ times the average, can be so planned that each has a rear access for goods. Plots towards the left of Fig. 71 show the variety of plots that can be provided behind shop frontages of uniform width; those on the right show the variety obtainable where all plots run the full depth with a varying width of frontage. In Fig. 72 both depths and widths of plots are varied to show the maximum variation of plot area which is conveniently obtainable, and it is probable that the differing needs of developers may quite frequently call for the development of a street block in a manner similar to Fig. 72.

224. Planning Authorities should require developers to make provision for the loading and unloading of goods' vehicles within plot boundaries in all cases where the quantity of goods likely to be handled renders such provision desirable.

225. Possible densities of accommodation for shopping development in the central area of a town of 250,000 population are indicated in Figs. 34 and 87. The streets on the right and at the bottom of Fig. 88 are major shopping streets. The 1939 Floor Space Indices for the two street blocks were 1.6 and 1.8 (Fig. 86) and the proposed Floor Space Indices are 1.65 and 1.70 (Fig. 87). These permit Floor Space Indices for the various individual plots to range from 1.58 to 1.94. The proposed Floor Space Indices would therefore allow the replacement, under much better siting conditions, of the 1939 total of accommodation.

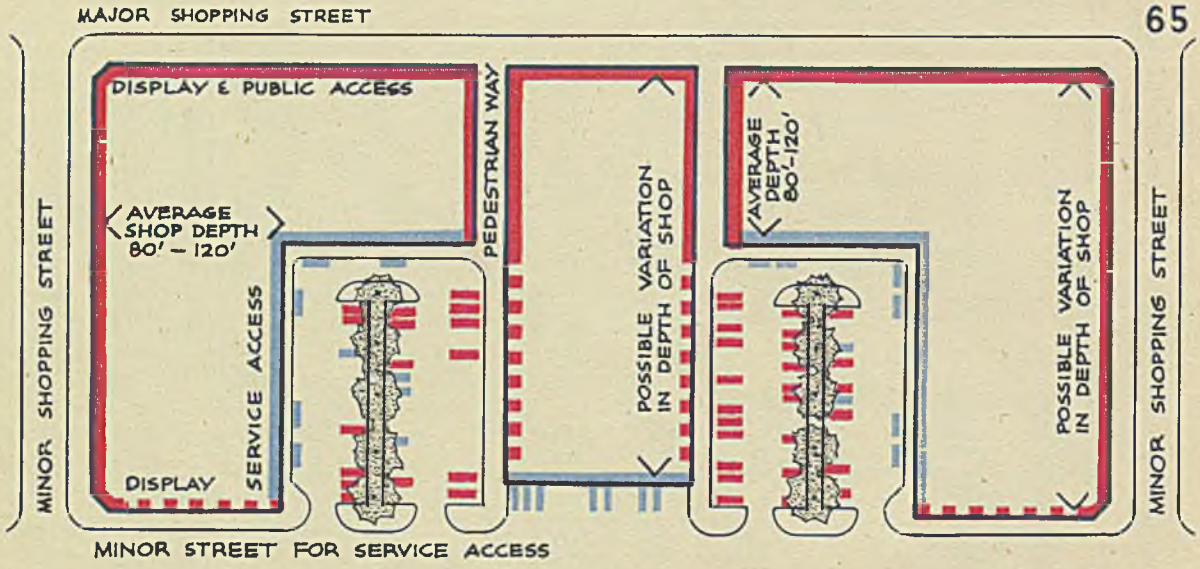
Office Development

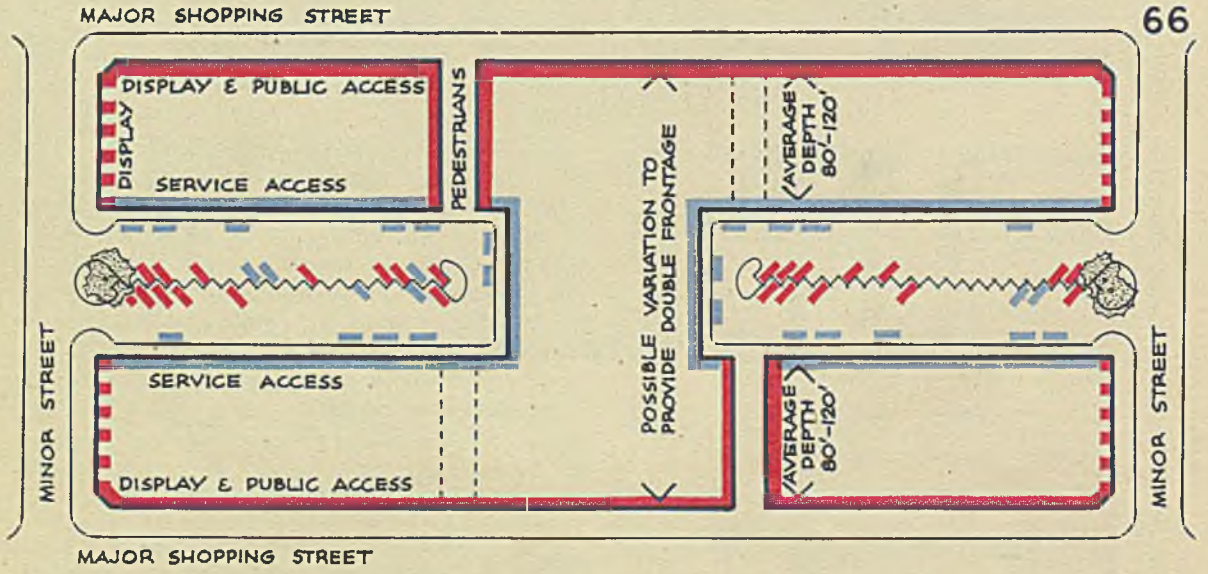
226. The siting requirements of office buildings have been considered in paras. 106-113 and 143-144 and include good daylighting and ventilation, freedom from the noise and vibration of heavy traffic and liberal provision for car parking. Fig. 73 shows a portion of a large building group, comprising high blocks and low connecting build-

LAYOUT OF SHOPPING BLOCKS IN A LARGE TOWN

shop display and public access — *shop display* — *private cars*

service access for loading and unloading — *goods vehicles*



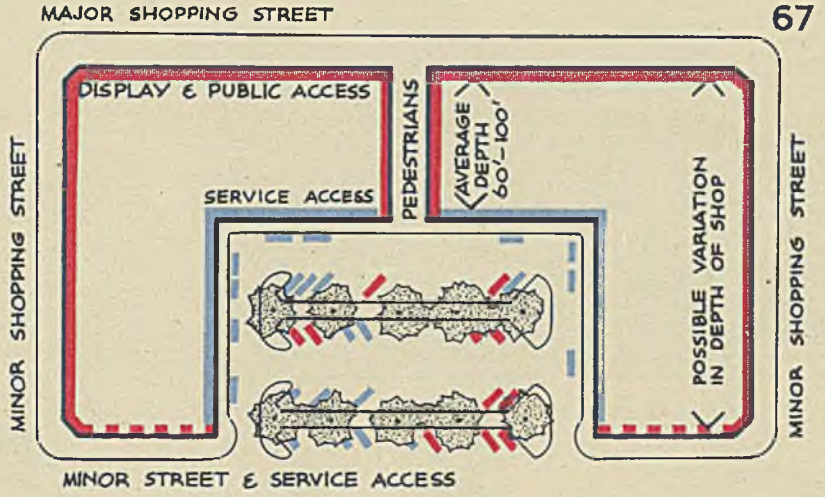


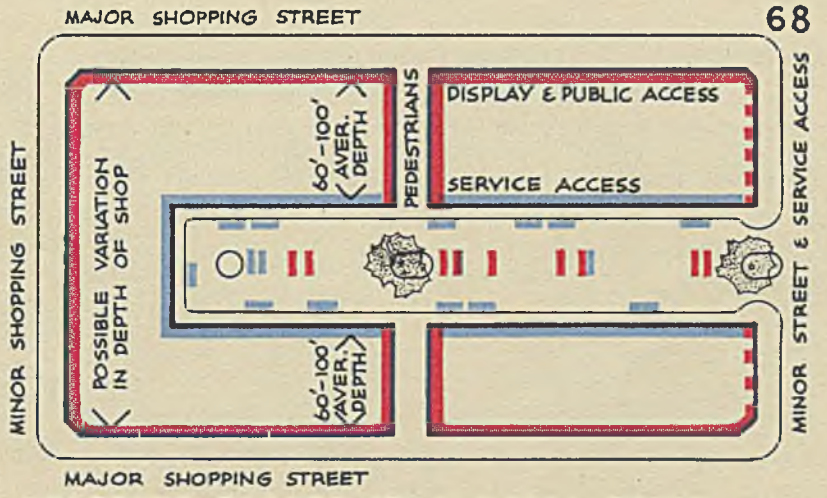
ings, in which special consideration has been given to these requirements: for the most part the office accommodation is well set back from street fronts and much of it overlooks open space. A layout on the lines of Fig. 73 would require a large site to be developed as a single building project. In general, it will be desirable for redevelopment in central areas to take place in larger units than has been customary in the past, and Planning Authorities are recommended to encourage suitable groups of developers to consider the development of their several plots as part of a single building project. It is probable, however, that office development will usually take place in smaller

LAYOUT OF SHOPPING BLOCKS IN A MEDIUM-SIZED TOWN

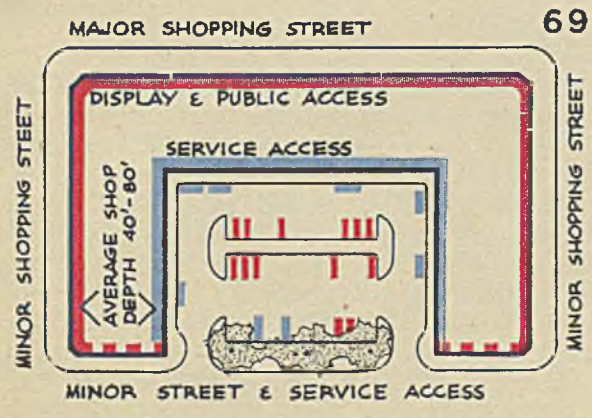
shop display and public access — *shop display* — *private cars*

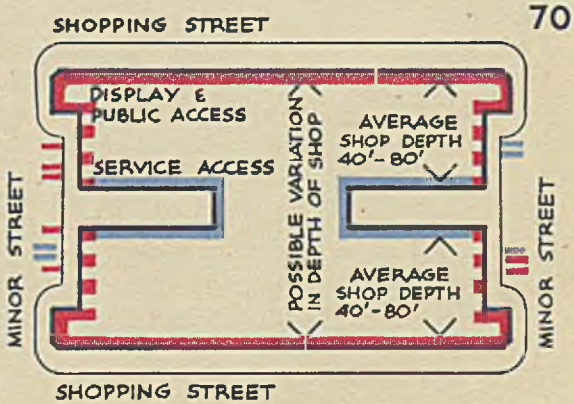
service access for loading and unloading — *goods vehicles*





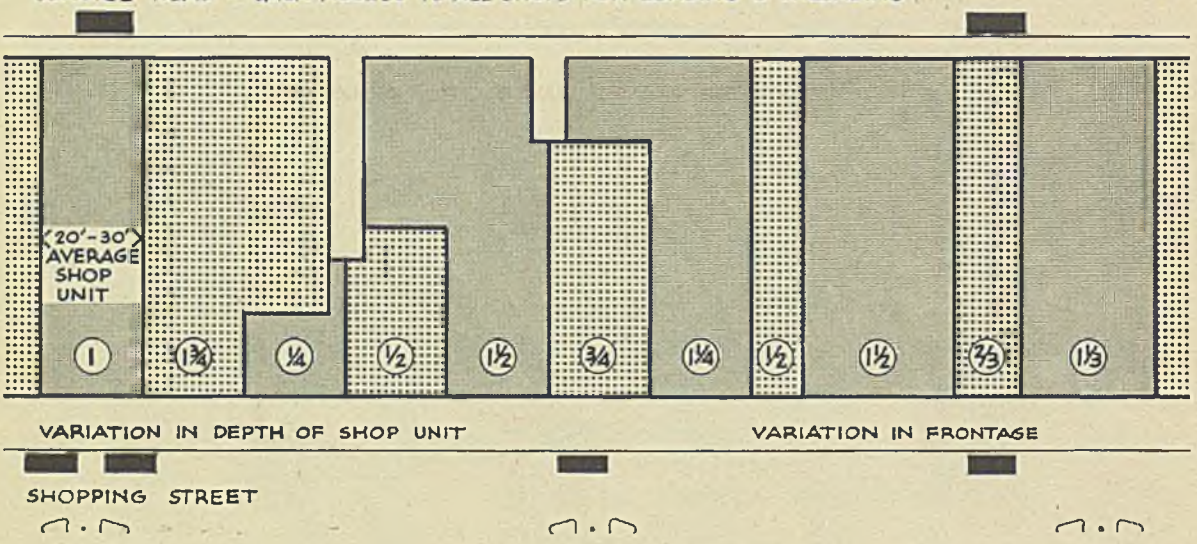
LAYOUT OF SHOPPING BLOCKS IN A SMALL TOWN





SUBDIVISION OF SHOPPING BLOCKS

71



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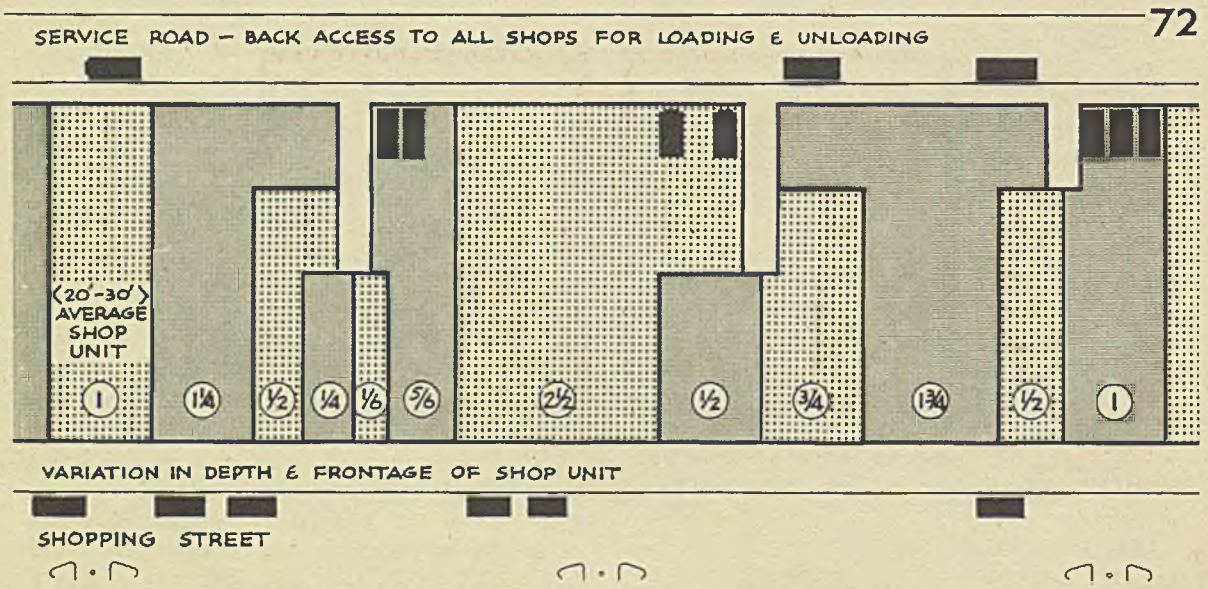


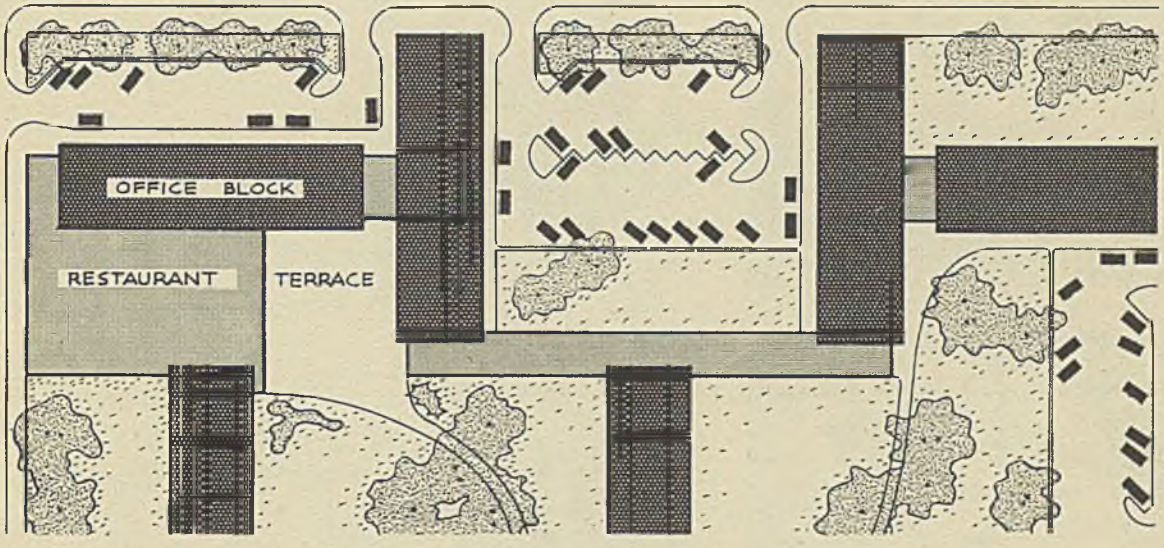
units than that shown in Fig. 73 and in these cases siting conditions should approach as closely to those indicated in Fig. 73 as is reasonably practicable.

227. Four office buildings, or groups of office buildings, are shown in Figs. 88 and 94. These occur, in the right-hand street block, at centre and top left; and in the left-hand street block, at top right and left. Each of these buildings is sited to obtain some of the advantages of the layout in Fig. 73. It may also be seen, by reference to Figs. 86 and 87, that the total of accommodation provided within the proposed new buildings is much the same as that which existed in 1939.

228. This reprovision of the 1939 total of accommodation in the redevelopment scheme illustrated in Figs. 88 and 94 deserves special notice. The mention in this handbook of Floor Space Indices of less than 2.0, the recommendation that offices should not normally be provided over shops and the illustration of layouts of a much more open kind than now exists in most central areas, may give the impression at first reading that redevelopment plans should provide for a

LAYOUT OF A LARGE GROUP OF OFFICE BUILDINGS

73



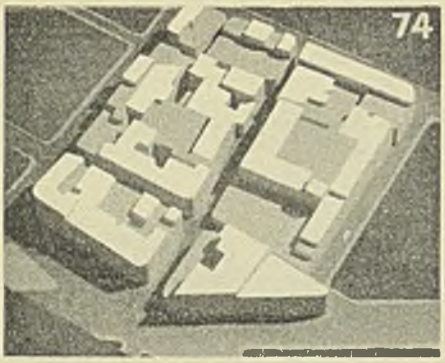
considerable reduction of the total accommodation which existed in central areas in 1939. This is not so. It is expected that, in general, redevelopment plans will provide for much the same total of accommodation as existed in the central area in 1939, although there may be many changes of use. It is however, recommended that the total accommodation provided should be spread more evenly over the central area than in 1939; and this may well involve a reduction of the 1939 Floor Space Indices of some street blocks and an increase of others.

229. It should be noted that the provision of a high standard of daylighting, convenience and amenity in a group of new office buildings does not, taken by itself, require a reduction of the 1939 Floor Space Indices, however high these may have been. This is made clear by an examination of two small areas in Central London, in which the density of existing buildings is greater than is likely to exist in provincial cities, other than in a few exceptional cases. These areas are illustrated in Figs. 74-77 (Floor Space Index of 3.1) and Figs. 78-81 (Floor Space Index of 2.9), which show existing buildings and three alternative schemes of redevelopment for each area. The street blocks concerned are largely occupied by office buildings.

230. The existing Floor Space Index of each area has been retained in the three alternative redevelopment schemes. The variables are the height of buildings and the size of the redevelopment unit. For example, in Fig. 74 buildings are from 2 to 8 storeys in height and the plot areas are of many shapes and sizes, mostly small. In Fig. 75, the bulk of the accommodation is in 4 or 5 storey blocks, but redevelopment could still conveniently be carried out by many different developers and on plots of varying size. In Fig. 76 the great bulk of the accommodation is in three 8-storey blocks, each of which could most conveniently be erected by a single developer or group of developers. Finally, in Fig, 77, the great bulk of the accommodation is contained in four 10-storey blocks, which also could most conveniently be carried out as three building projects.

231. Redevelopment to a high Floor Space Index, while also obtaining good siting conditions for each building is therefore quite practicable where developers are willing to undertake large projects and to build high. But except in the largest towns proposals for development of this kind are likely to be relatively few. Moreover, if the relative amount of accommodation which is allowed to be provided in a small part of the central area is much greater than elsewhere, a concentration of values within the favoured area is almost certain; and this would lead to competition among intending developers for plots near the favoured area and refusal of plots elsewhere. For these reasons the Floor Space Index allowed for offices should not greatly exceed that allowed elsewhere in the central area.

ALTERNATIVE WAYS OF REDEVELOPING AN OFFICE AREA



DEVELOPMENT AS EXISTING IN 1939

No planning; congestion of small buildings; access and circulation confused in narrow streets

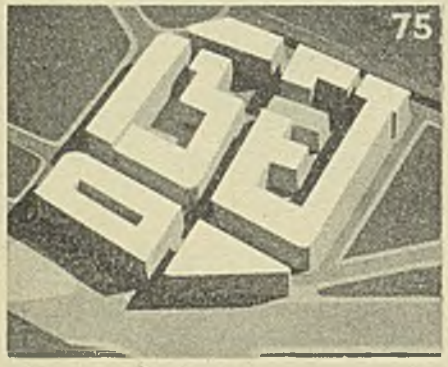
Car parking impossible

Daylighting inadequate

Sound insulation poor

Ventilation unsatisfactory

No open space



PRE-WAR TYPE PIECEMEAL REDEVELOPMENT

Access and circulation improved

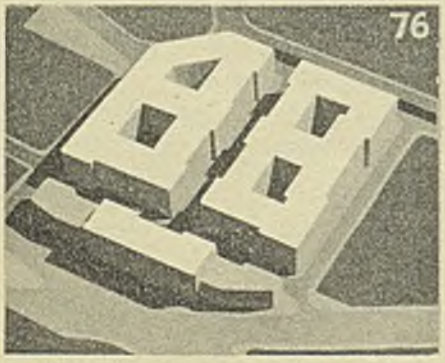
Parking for 5-10 cars only

Daylighting poor

Sound insulation poor

Ventilation improved

No open space



REDEVELOPMENT IN LARGE UNITS WITH COURTYARDS

Access and circulation more clearly defined

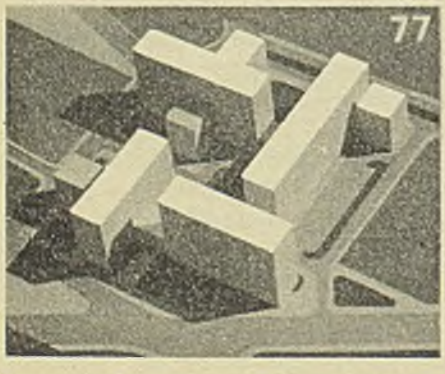
Car parking facilities poor

Daylighting fair to poor

Sound insulation poor

Ventilation slightly improved

No open space



REDEVELOPMENT IN LARGE UNITS WITH OPEN PLANNING

Access and circulation clear and efficient

Parking for 60-70 cars

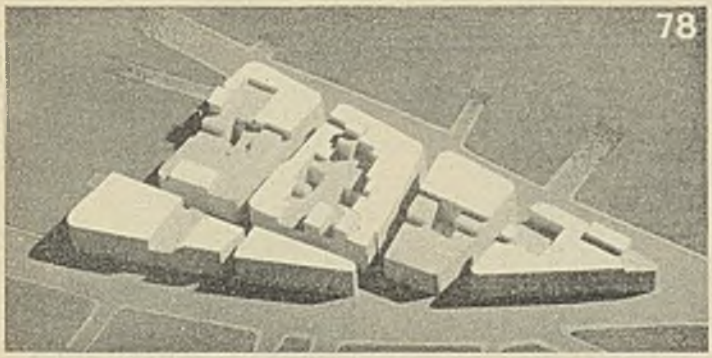
Daylighting good in all rooms

Ventilation good

Sound insulation good

Generous open space on all sides

ALTERNATIVE WAYS OF REDEVELOPING AN OFFICE AREA



DEVELOPMENT AS EXISTING IN 1939

No planning; congestion of small buildings; access and circulation confused in narrow streets

Car parking impossible

Daylighting inadequate

Sound insulation poor

Ventilation unsatisfactory

No open space

PRE-WAR TYPE PIECEMEAL REDEVELOPMENT

Access and circulation confused

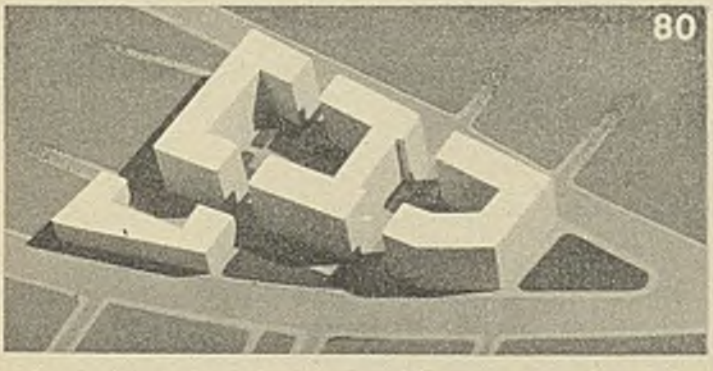
Car parking facilities poor

Daylighting fair to poor

Sound insulation poor

Ventilation slightly improved

No open space



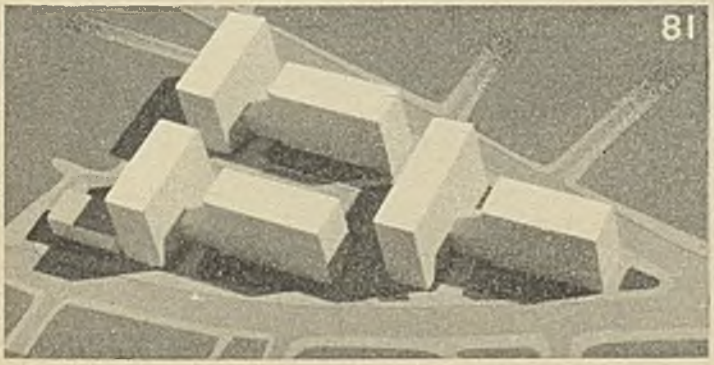
REDEVELOPMENT IN LARGE COURTYARD UNITS

Access and circulation improved

Parking for 30-40 cars in courtyards

Daylighting, sound insulation and ventilation fair

Two small areas of open space



REDEVELOPMENT IN LARGE UNITS WITH OPEN PLANNING

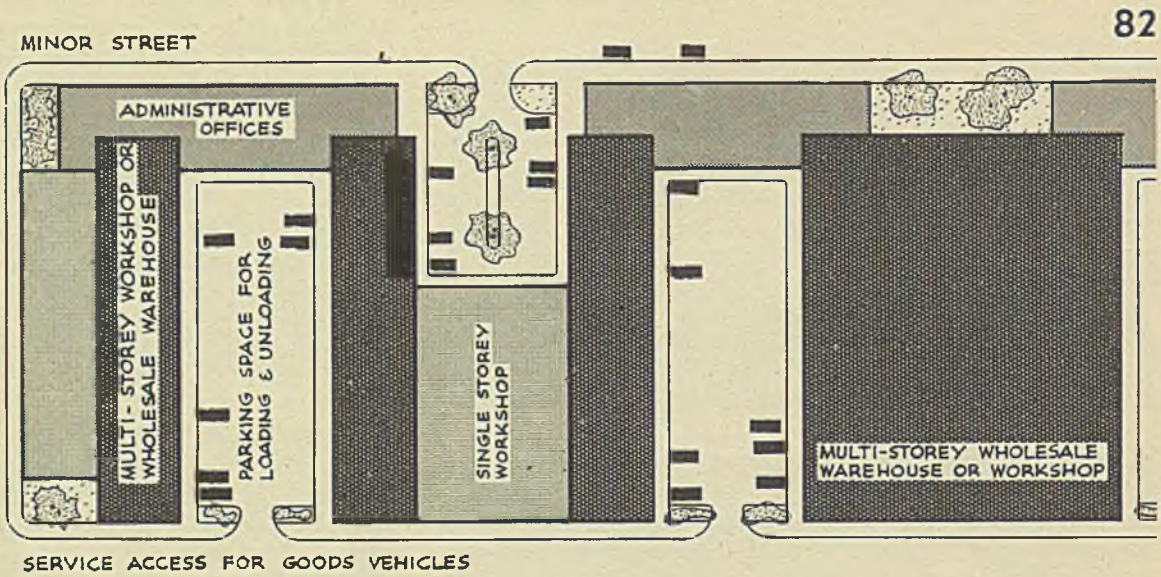
Access and circulation clear and efficient

Parking for 60-70 cars

Daylighting good in all rooms

Ventilation and sound insulation good

Open space on all sides



WAREHOUSE & LIGHT INDUSTRIAL DEVELOPMENT

Wholesale Warehouse and Light Industrial Development

232. Office and showroom space in wholesale warehouses will require a high standard of daylighting, and wholesale warehouses will also need provision for loading and unloading of goods' vehicles within the plot boundary. These requirements may be obtained by a layout similar to that shown in Fig. 82, in which office and showroom space is arranged along one frontage with storage space and loading and parking space behind. A street block laid out in this manner may be subdivided in a number of ways to suit the needs of different developers.

233. The type of layout shown in Fig. 82 is also likely to prove suitable for light industrial buildings in central areas.

234. The order in which the various plots within a street block might be redeveloped and certain matters of layout related thereto are considered in paras. 266-270.

IV. CONTROL OF THE EXTERNAL APPEARANCE OF BUILDINGS

235. In order that a high standard of architecture should be achieved in a street or group of buildings it is necessary, first, that each building should be designed by a competent architect and, secondly, that there should be a reasonable balance, and harmony in the layout, general form and colour of the buildings as a whole. The aim of control of the external appearance of buildings by the Planning Authority is to secure the second of these two requirements, and the most suitable kind and degree of control must necessarily vary according to the character of the street or neighbourhood.

236. The layout, form and appearance of new buildings should be influenced by existing buildings, especially buildings of historic interest or special architectural value. In an area which contains isolated buildings of special architectural value, new development adjoining these buildings might be so regulated as to preserve the value of the latter in the general composition of the street. In an area containing many such buildings, it is reasonable that the height, general form and colour of the majority of new buildings should be related to those of the existing buildings; although the value by contrast of an occasional high building, or small group of high buildings, should not be overlooked. It is not, of course, suggested that any new buildings should seek to reproduce in detail the architectural form or features of existing buildings.

237. In other cases, for example, where a complete new street or series of streets are required, it is desirable for developers to have reasonable

freedom to decide the block form of their buildings, their height and their detailed design. The measure of freedom in these matters which an individual developer may reasonably demand cannot be laid down in precise rules that are capable of general application, but if the aims which the Planning Authority seeks to achieve by a control of external appearance are made clear to developers and their architects, it should be possible to reach a fair decision in each individual case.

238. The central question involved is the contribution which an individual developer should be asked to make towards the appearance of the street as a whole. An increasing number of developers in central areas are likely to wish to erect buildings which have been specially designed to meet the needs of their particular businesses; and since a central area is essentially an aggregation of specialised buildings, it is desirable in general that, subject to the Floor Space Index and daylighting controls, developers should have considerable freedom of decision concerning the block form and height of their buildings. On the other hand, it is highly desirable that the composition and general effect of a street should possess both balance and a reasonable measure of continuity and cohesion. A wisely exercised control of external appearance should enable both these objectives to be secured with the least possible restraint of developers' freedom in matters of design. The Planning Authority should be advised in this matter by a competent architect, and it is suggested that sketch designs or models, should be prepared, which will show buildings in block form and provide for such a variety of buildings as is thought likely to meet developers' needs. Each proposed building should then be examined as regards its effect on the proposed street as a whole, and difficult cases should be discussed between the developer's architect and the Planning Authority. In most of these cases a solution acceptable to both parties is likely to be reached. Where agreement cannot be reached the Planning Authority should refuse consent to the development. It should be noted that the Ministry does not recommend that developers should be required to conform to any detailed scheme of architectural design prepared for the street as a whole.

239. The effect of continuity desirable in a shopping street may be achieved in part by the careful design of footways and street furniture and the observance of a uniform height for shop fascias. Above the fascia line, control should be exercised in a manner which will, on the one hand, allow the full use of modern materials and methods of construction and, on the other prevent an individual developer obtaining an undue conspicuousness for his building at the expense of the street as a whole. It should be noted that if buildings of different heights are to be permitted in the same street, control of external appearance must extend to all visible faces of the building, and not merely to street fronts.

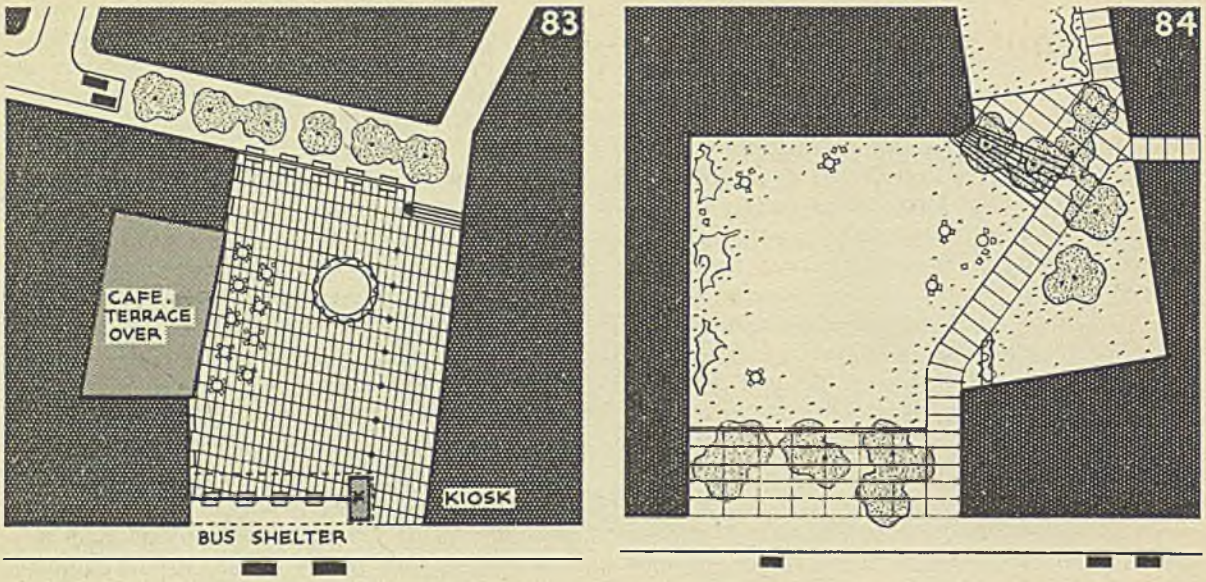
240. Finally, it should be stressed that, as has been mentioned in para. 235, control of external appearance by the Planning Authority is complementary to, and can never be a substitute for, the employment of competent architects by individual developers.

V. OPEN SPACES AND STREET PLANTING

241. Residential accommodation for families should not be located in the central area, nor should new open spaces which serve residential areas near the central area. The central area, however, should contain a well-distributed pattern of small open spaces of kinds which are specially suitable for use during the lunch hour.

242. The open spaces should normally be somewhat set back from main streets and contain trees, shrubs, flowers and some grass areas. On fine and warm days the open spaces are likely to be heavily used for short periods, and it may therefore be necessary for a large portion of their area to be paved. There is great scope for ingenuity in the location and design of these small open spaces. They may be linked with a system of pedestrian ways or used as sound baffles to office buildings, and make pleasing use of irregularly shaped pieces of ground. Sometimes disused burial grounds may be appropriated for this purpose, and the opportunity of using the site of a bombed building should not be overlooked. The layout should be informal, and make use of differences in ground level and, on occasions, of existing walls; provision may be made for light refreshment and newspaper kiosks and public conveniences. Two possible layouts for small open spaces are shown in Figs. 83 and 84.

243. Existing trees should be preserved throughout the central area so far as is practicable, and new planting of trees, shrubs and grass in suitable positions should be encouraged. Suitable positions for larger trees include open spaces, positions within site boundaries not too close to buildings,



POSSIBLE LAYOUT OF SMALL OPEN SPACES

and within larger roundabouts. In general trees should not be placed in shopping streets. Smaller trees and shrubs may be more liberally distributed. They may be placed in traffic roundabouts, around car parks and bus stations and sometimes in paved pedestrian ways. It is very important that trees and taller shrubs should not be placed where they will obscure traffic sight lines.

244. Greater use could with advantage be made of street planting in minor streets. The wartime removal of iron railings provides one opportunity of doing so by the use of hedges as boundary fences. Other possibilities include the use of paved and planted areas in combination, and of " movable planting " in tubs and troughs.

245. Street planting is further considered in the Ministry of Town and Country Planning's Circular No. 24, which includes a list of suitable tree species.*

*See Bibliography, No. 7.

Chapter 5: The Guidance of Redevelopment

246. The achievement of the main aims of the plan is dependent on the skill with which the actual process of redevelopment is guided. This applies with special force to the earlier stages of redevelopment in war-damaged towns, and the following paragraphs are therefore particularly concerned with the problems of Planning Authorities responsible for the redevelopment of war-damaged central areas. Guidance of the standard needed will call for a most careful balancing of the various factors and interests affected by each main step in the redevelopment process, and this consideration should preferably be given by means of regular meetings between the planning officer and the other officials principally concerned —for example, those concerned with finance, estate development and management, architecture, civil engineering works, transport and traffic.

247. The stages by which redevelopment is intended to be carried out, and the time estimated to be needed for the completion of each stage, will have been considered during the preparation of the plan, and will indeed be part of the basic structure of the plan. The complete plan will show, within the limits of current knowledge and foresight, how the long-term needs of the central area can best be supplied. But the parts of the complete plan which it is intended to carry out during the various stages should also be examined separately as self-contained operations, of which each should make an individual contribution to the improvement and character of the town. The work done during each stage should be useful and complete in itself and prepare the way for the next stage of redevelopment in terms of physical construction. It should also prepare the way psychologically by the high quality of the new buildings and their surroundings, and by their location in places which will encourage later development to proceed along the lines laid down in the plan.

I. THE FIRST STAGE OF REDEVELOPMENT

248. Decisions concerning the works to be carried out during the first stage of redevelopment in war-damaged towns will be of special difficulty. Many of these towns have suffered severe financial losses from the destruction of large portions of their shopping and business areas, and restoration of trade as soon as possible is of great consequence to their future. Moreover, in a few war-damaged towns, the long-term needs of the central area may seem to require the removal of an established centre of trade—such as the retail market—from its 1939 location, and the Planning Authority may be faced with a choice between a dangerous delay in the re-establishment of trade and jeopardizing a main aim of the plan. But although a few Planning Authorities may be faced with a hard choice of this kind, it is believed that such cases should be rare. As has been suggested in previous paragraphs, the plan should aim to open up and spread or improve established centres rather than to remove them, and, in general, care should be taken from the beginning to ensure that the plan itself does not involve a conflict in major matters between immediate and long-term needs. In all war-damaged towns, however, the Planning Authority will have to take difficult decisions during the first stage of redevelopment concerning the allocation of available building labour and materials between works that would satisfy pressing needs and those that would enable later stages of redevelopment to proceed more quickly. In reaching such decisions, certain general considerations should be kept in mind.

249. From the time when the main lines of the redevelopment plan have been decided, all redevelopment, whether in temporary or permanent construction, should be regarded as part of a single continuous process. The Central Advisory Committee on Estate Development and Management have stated in their report* that a temptation may exist in war-damaged towns to treat the provision of some sort of accommodation for recovery purposes as an emergency and preliminary operation, which is in large measure distinct from the permanent redevelopment of the area according to the redevelopment plan. The Ministry shares the view of the Committee that any attempt to divide up redevelopment in this manner is impracticable and open to serious objections.

250. Much importance is attached to this matter. During the first few years of reconstruction, values

* See Bibliography, No. 8.

in war-damaged central areas will be in a fluid state, but will soon tend to settle, and any renewed disruption after they have once settled would hinder the general trade recovery of the area. It would therefore be unwise for a Planning Authority to set up a temporary shopping or office centre on some convenient site with the intention of later transferring it to permanent buildings some distance away. Valuable goodwill might become attached to the temporary site and later transfer of the centre might prove impracticable.

Temporary Development

251. The need for the speedy restoration of trade will require every war-damaged town to consider carefully the various means by which the largest amount of accommodation for traders can be most quickly provided, and this involves the difficult question of the extent to which the Planning Authority should encourage the use of available labour and materials for temporary as opposed to permanent works. The question is peculiarly one for local decision, since it turns largely on the kind and amount of accommodation most needed and on local siting and other conditions, but certain of its aspects are applicable to all war-damaged towns.

252. In the first place, as has been stated in para. 249, temporary development should be regarded as part of the general process of redevelopment and its location should conform to the use zones laid down in the plan, and to the proposed lines of new streets. The fact that wartime exigencies may have led to the erection of temporary buildings or the adaptation of buildings which conflict with the zoning proposals of the plan should not be used as an argument for granting further concessions.

253. Secondly, up to 1939, it had almost always proved very difficult to secure the removal of temporary buildings at the end of their agreed "life," and Planning Authorities should therefore pay particular attention to this matter. The most effective way to control the life of temporary buildings is for all such buildings to be built on land owned by the Planning Authority. Preferably each temporary building should be built on a portion of the site in which its occupier will eventually be rehoused in a permanent building, and where this is impracticable the location agreed should come as close to it as conditions permit. It is desirable that before arrangements are concluded for the lease or erection of a temporary building, the location of the occupier's permanent accommodation should have been agreed.

254. Shops are predominantly a ground floor use, and in order to provide as much shopping accommodation as possible during the first years of reconstruction, the suggestion has been made that the ground floors only should be erected of some permanent buildings which will later be completed as multi-floored buildings. This procedure would have the advantages, where an extensive area of cleared land is immediately available, of "outlining" in permanent form a larger portion of the plan than would otherwise be possible in the same time, and of providing that portion of the buildings concerned which is most useful for shops. There are, however, drawbacks to the proposal. The construction of upper floors at a later date will cause renewed disturbance on a considerable scale in an area which may have just become established as a prosperous trading centre. In addition the number of buildings in the shopping zone of more than two, or at most three, floors is likely to be small (see paras. 107-110 and 140-142) and the ground floors—including foundations—of tall buildings require proportionately more labour and materials than do the ground floors of lower buildings. For these reasons, it will usually be better if labour and materials allow, to complete the construction of permanent buildings in a single operation. The Planning Authority should, however, try to ensure that most of the permanent buildings which are built during the first stage of redevelopment are 1, 2 or 3-floored buildings of simple and economical construction.

Sequence of Work during the First Stage of Redevelopment

255. The present shortage of usable building accommodation of all kinds will make it necessary for redevelopment during the first stage to be confined to sites on which no repairable buildings remain, and this necessity should be taken into account during the preparation of the plan. It is not suggested that the long-term needs of the central area as regards the location of building uses should be disregarded in order to bring on to cleared sites the buildings which it may be most convenient or profitable to build first. But a reasonable balance should be struck, for it is evident that a plan which fails to allocate to cleared sites a reasonable number of buildings of the kinds most needed must contribute towards a delay in recovery of a pre-war level of trading

prosperity. The Ministry has examined redevelopment plans in which major portions of the land available for immediate redevelopment have been allocated to traffic roundabouts, public buildings, bus stations and other forms of development that do not seem likely to be among those most urgently needed in most war-damaged cities. A large part of the cleared land should be allocated to the most needed types of building and a further part should be kept in reserve for use during the "decanting" process referred to below. In most war-damaged central areas the accommodation most urgently needed would seem to be that suitable for shops and offices, although in each town it may also be desirable to erect a few buildings of other types as soon as possible.

256. The shortage of building accommodation also suggests that during the first stage of redevelopment the bulk of the available labour and materials should be used for the construction of buildings rather than for roads and other civil engineering works. The actual allocation must, however, be governed by local conditions. In some towns the execution of a moderate initial programme of civil engineering works may enable a faster rate of rebuilding to be achieved thereafter, or may assist the recovery of the town in other ways. It follows that if civil engineering work is to be kept to a minimum during the first year or two, the first new buildings must be sited in positions where they can make use of existing roads and services.

257. Constructional work during all stages of redevelopment should be planned so as to minimise disturbance to adjoining occupiers. This applies with special force to work during the first stage, during which the trade carried on in existing buildings will be of particular importance to the recovery of the central area. It is therefore important that first stage redevelopment should take place within a few carefully chosen street blocks or groups of street blocks and that redevelopment of these blocks should be substantially complete before rebuilding begins elsewhere. If the chosen street blocks adjoin busy streets the Planning Authority should try to ensure that building traffic causes the minimum of obstruction in the busy streets.

258. Where a war-damaged area is of some size, the Planning Authority is recommended to subdivide it for reconstruction purposes into two or more smaller areas, to be redeveloped in turn, each of which could be redeveloped in a period of 5-7 years. In choosing the area to be redeveloped first, the Planning Authority should bear in mind that the first buildings to be erected should not all be placed together, but should be located in small groups at several different points so as to encourage the later infilling of the central area in accordance with the redevelopment plan. There will be a tendency for high values to settle on the first commercial buildings to be rebuilt in a war-damaged town* and if the new buildings are all located in one place the redevelopment of the rest of the central area in accordance with the plan might be jeopardised. The location of the new buildings in several groups at some little distance from each other would on the other hand assist the attainment of high values at several places in the central area, with reasonable gradations between. For these reasons the area to be redeveloped first should be chosen with special care and in some cases, may appropriately be of somewhat larger size than areas which will be redeveloped later. In towns in which any considerable amount of temporary development is being carried out, the Planning Authority should try to ensure that redevelopment at each chosen point includes both temporary and permanent buildings.

259. The plan showing the intended position at the end of the first stage of the redevelopment process may usefully be tested by the extent to which it seems likely to achieve the following aims:—

(i) Satisfaction of the most pressing needs of the area as regards new building accommodation.

(ii) Some improvement of traffic circulation including in particular provision of car parks.

(iii) Preparation for the execution of later stages of development, including the provision of accommodation, perhaps outside the area, for firms and persons who will be displaced.

(iv) Location of a large proportion of new buildings in positions where they can use existing roads and services.

(v) Minimum disturbance to occupiers of existing buildings.

*Ministry of Town and Country Planning. Estate Development and Management Problems in War-Damaged Areas, para. 35.

TABLE 5. REDEVELOPMENT PROGRAMME

Summary of Building Programme to show—by reference to floor space contained in long life, destroyed and obsolete buildings—the approximate order in which various kinds of new accommodation should be provided. Areas in acres or thousands of sq. feet.

BUILDING USES	PROPOSED FLOOR AREA		LONG LIFE BUILDINGS CLASSES A & B		FLOOR AREA TO BE BUILT									
					DESTROYED		OBSOLETE Class D		SHORT LIFE Class C		PROPOSED INCREASE over 1939 accommodation		TOTAL	
	Grd. Flr.	Other Flrs.	Grd. Flr.	Other Flrs.	Grd. Flr.	Other Flrs.	Grd. Flr.	Other Flrs.	Grd. Flr.	Other Flrs.	Grd. Flr.	Other Flrs.	Grd. Flr.	Other Flrs.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
B Residential Buildings (other than Dwelling Houses)														
D Shops area feet run of frontage														
E Offices														
F Wholesale Warehouses														
H Public Buildings and Places of Assembly														
J Light Industrial Buildings														
M Other Buildings														
TOTAL BUILDING USES														

The building programme in main stages will be based on the availability of cleared sites and the useful life of remaining buildings. Table 5 should be kept up-to-date to assist in maintaining a fair balance of redevelopment in terms of most needed buildings.

II. LATER STAGES OF REDEVELOPMENT

260. The most difficult part of the Planning Authority's work during later stages of reconstruction will be to ensure the execution of the various major items in approximately the right order and at the right times. When sites which are already cleared have been redeveloped, progress will depend on the rate at which existing buildings can be demolished. The second stage of reconstruction will therefore largely be confined to areas occupied by obsolete buildings which should be replaced directly other accommodation can be found for their occupants. (See Fig. 23).

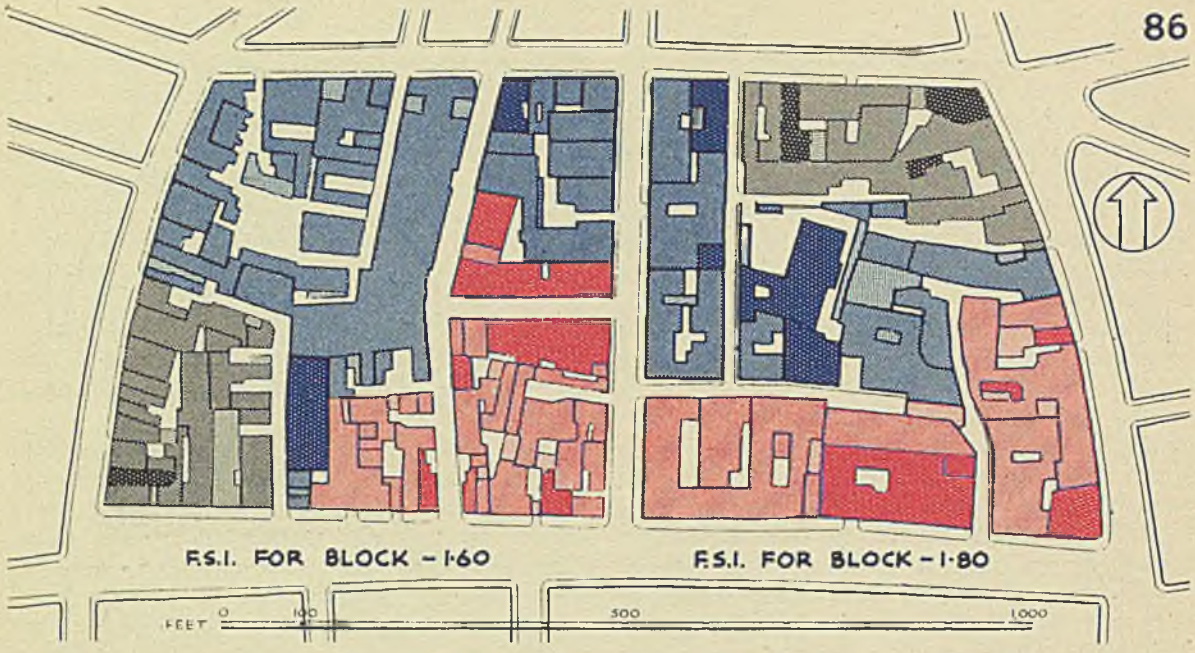
261. The plan will usually have allocated some of the land occupied by obsolete property of this kind for the opening up of the central area by the construction of some new streets and for other traffic improvements much as the construction of a portion of the Inner Ring Road. New services will also be needed to serve sites which are about to be redeveloped. The execution of civil engineering works is therefore likely to form a large part of the second stage of reconstruction.

262. The Planning Authority will find it necessary at all stages to keep available a proportion of cleared land ready for immediate development. Redevelopment of the central area of any larger town must necessarily involve a continuous and complex reshuffling process, and many towns must rely on the decentralization of the inhabitants of obsolete residential buildings to provide land for the carrying on of this process on an adequate scale. If this decentralization is delayed in any portion of the central area it may delay the erection both of, for example, a new technical college which was to have replaced the demolished dwellings and also of the buildings which were to have replaced the old technical college. In the early years of rebuilding it will be essential to maintain a sufficient reserve of free land, or elbow room, to allow this reshuffling or decanting process to make headway. It is recommended that the Planning Authority should decide what reserve is needed for steady progress, and should not thereafter permit development on land included in the reserve which does not, on the average, set free an equal amount of land elsewhere in the central area.

263. Throughout the redevelopment process the Planning Authority should try to ensure that a good balance is kept between, on the one hand, the provision of roads, services, car parks, open spaces and amenities and, on the other hand, the provision of various kinds of buildings. The Planning Authority should encourage the erection of those types of buildings which either attract other development, as in the case of branches of certain popular multiple stores, or will increase the all round attractiveness of the town, as may be done by an additional hotel, restaurant, theatre or cinema. It is not possible to lay down general rules concerning the optimum number of buildings of each type for a town of a given size but it will be easy to determine whether the number of buildings of each more important kind is one which clearly falls short of the reasonable needs of the town.

264. Table 5 (Fig. 85) summarizes the redevelopment programme in terms of the amount of building accommodation of various kinds which should be provided during each main stage. Cols. (2) and (3) (obtained from Cols. (8) and (9) of Table 3) show the total amount of floor space estimated to be needed. Cols. (4) and (5) show the approximate amount of floor space which is contained in long life buildings (Classes A and B in para. 47), and will therefore not require replacement during the period of the main redevelopment programme. Cols. (6)-(13) contain between them the main rebuilding programme and indicate broadly the amount of new accommodation which the Planning Authority should seek to provide during each stage. Cols. (6) and (7) by showing the kinds and amounts of accommodation destroyed during the war, will normally be a guide to the types of building which should be rebuilt first. The information needed to complete Cols. (4)-(11) of the Table may be obtained from the Field Survey Sheets (see paras. 46-48).

265. It has been recommended that plans should be prepared for each stage of redevelopment to show the intended position at the end of the stage. During the early years of redevelopment it may be expected that necessary changes in the programme will concern the pace of rebuilding rather than kind or location, but it is inevitable that during later stages some modifications of the plan's proposals will suggest themselves. It is of the greatest importance that changes of any kind should be carefully examined as regards their effect on the carrying out of the plan; otherwise guidance of redevelopment may degenerate into the taking of decisions on grounds of day to day expediency, and the actual redevelopment may increasingly diverge from the intentions of the plan. It is therefore recommended that, in addition to the



STREET BLOCK DEVELOPMENT *density of existing accommodation and condition of buildings*

long life *short life* *no life*

regular meetings of officials mentioned in para. 246 the Planning Authority should arrange for full reviews of progress at yearly or two yearly intervals. For these reviews plans showing the actual progress achieved during the period under review should be available for comparison with those previously prepared to show intended progress. The reasons for major differences should be carefully examined, and precise decisions should be taken concerning either corrective action during the ensuing period or appropriate modification of the redevelopment plan.

III. STAGES OF REDEVELOPMENT WITHIN STREET BLOCKS

266. Some of the problems involved in the redevelopment of street blocks are illustrated in Figs. 86-94, which show a typical group of street blocks in the central area of a town of 250,000 population.

267. Fig. 89 shows in block form the buildings as they existed in 1939, and Fig. 86 shows the condition of buildings, in terms of probable life, at the beginning of the reconstruction programme.

268. It has been assumed that the two streets on the right and below the area are major shopping streets which should be disturbed as little as possible by builders' vehicles and the provision of services to new buildings. It is also desirable that when a new building has been completed, its occupants should not subsequently be disturbed by building operations taking place between it and the nearest main street. In the proposed regrouping of street blocks (Fig. 87) into larger units, three vehicular entrances into the major shopping streets have been eliminated, and the order of redevelopment suggested provides for plots nearest the major streets to be redeveloped first and should enable building traffic to reach plots from the rear. It will not always be possible for a Planning Authority to dispose of sites in the order best suited to an orderly progress of rebuilding, but if plans showing the proposed order are available to estate managers during negotiations it should be possible to do so in a fair proportion of cases.

269. Figs. 88 and 94 show the street blocks as they might appear when fully redeveloped, and the

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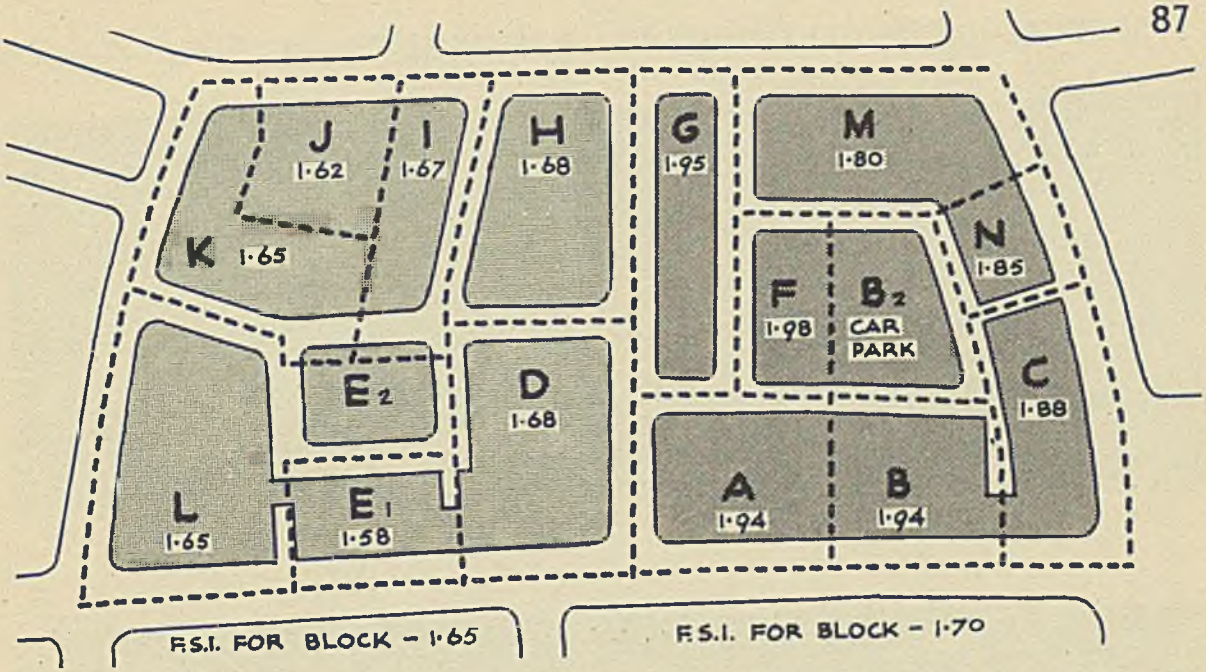
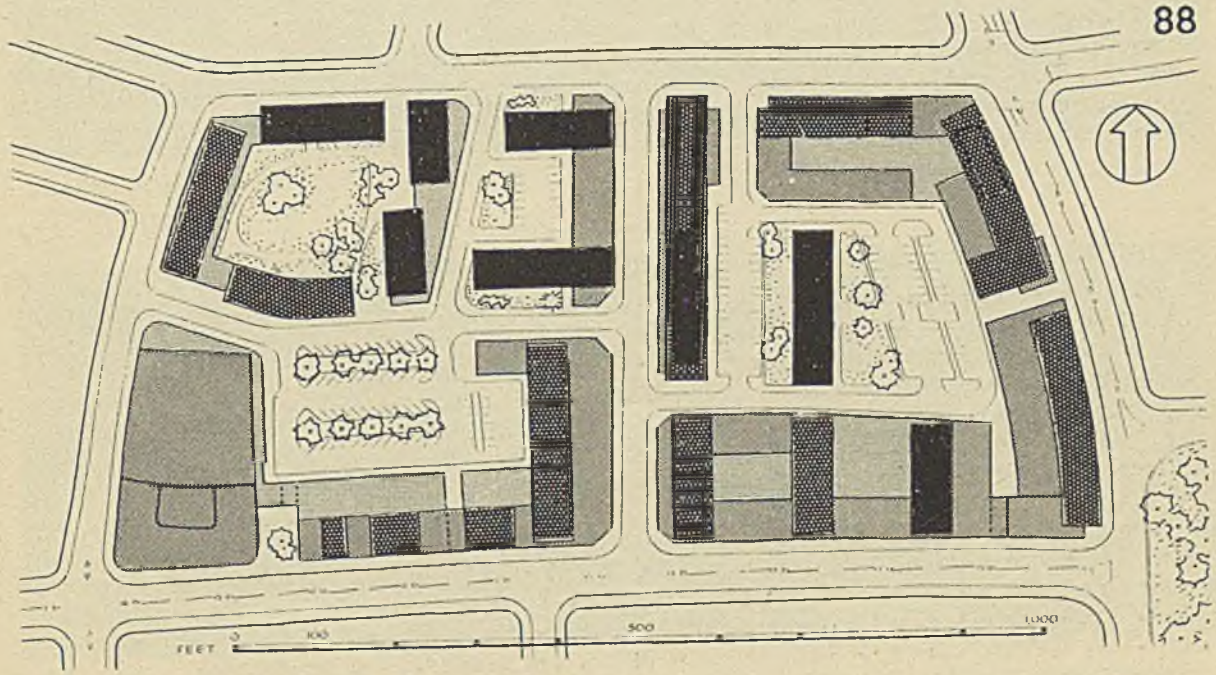


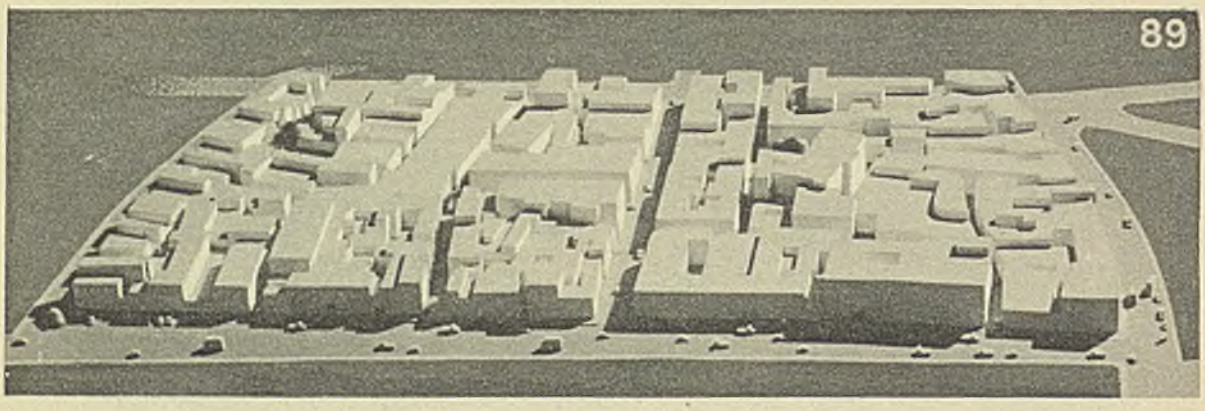
STREET BLOCK DEVELOPMENT *order of site clearance and redevelopment, for blocks and individual sites within each block.* *See also fig.* 34.

88

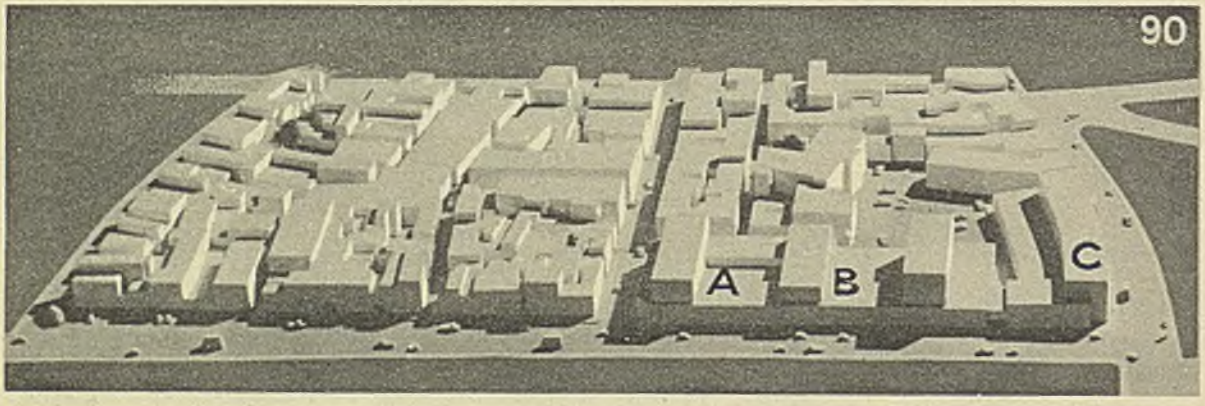


STREET BLOCK DEVELOPMENT *conjectural redevelopment at planned density of accommodation.*
See also fig. 60.

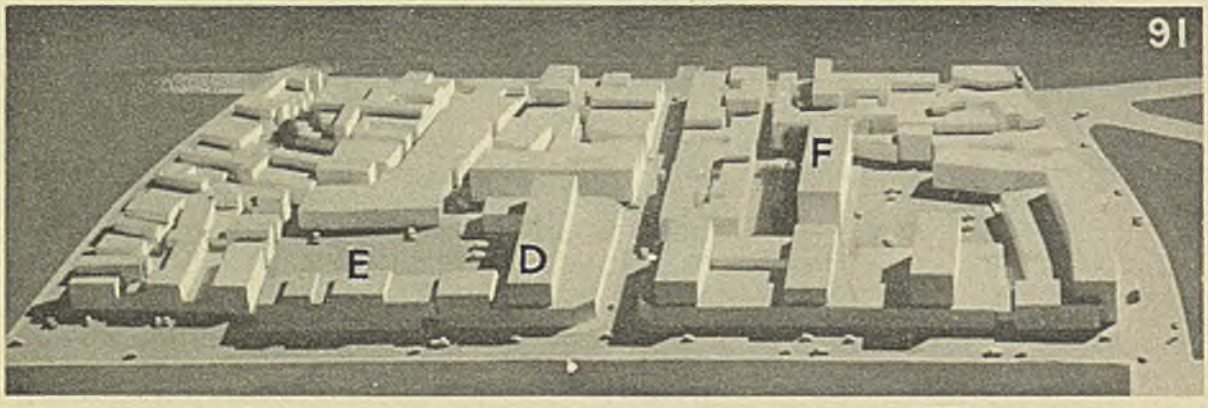
STREET BLOCK REDEVELOPMENT IN STAGES



development as existing in 1939

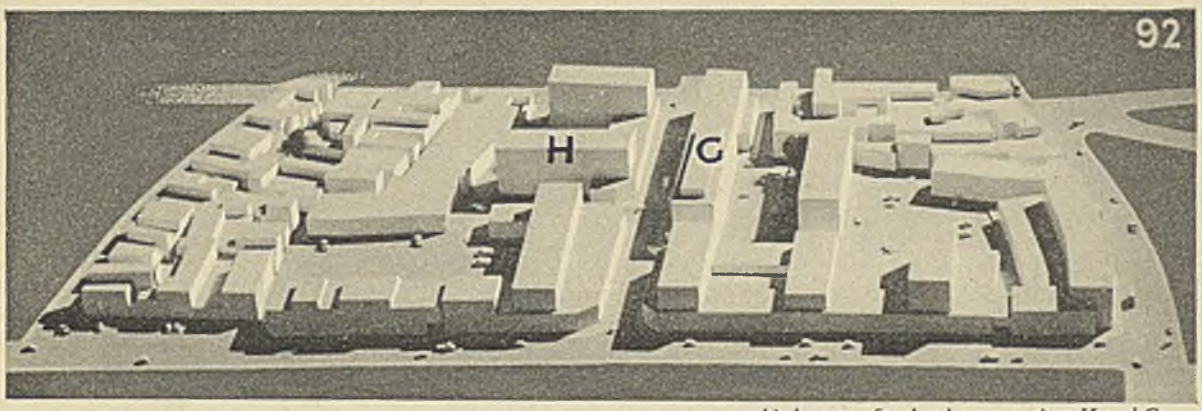


first stage of redevelopment, sites A, B and C



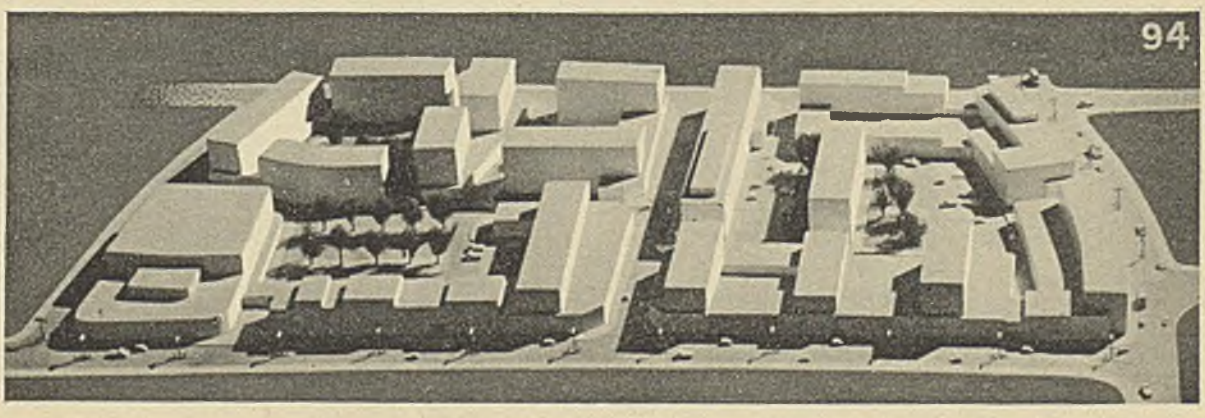
second stage of redevelopment, sites D, E and F

STREET BLOCK REDEVELOPMENT IN STAGES



third stage of redevelopment, sites H and G

fourth stage of redevelopment, sites I, J and K



redevelopment complete

process of redevelopment stage by stage is illustrated in Figs. 90-93.

270. The prompt redevelopment of each site after disposal will have considerable influence on the rate of development of neighbouring sites and thus on the pace of redevelopment as a whole. The means by which the Planning Authority may retain control in this matter are the subject of a recommendation by the Central Advisory Committee on Estate Development and Management.*

*Ministry of Town and Country Planning. Estate Development and Management Problems in War-Damaged Areas, paras. 105-113.

SUMMARY

THIS SUMMARY of main conclusions and recommendations of the handbook should be read in conjunction with the paragraphs of the text to which references are given. Qualifications and exceptions in the text have been omitted from the summary.

CHAPTER 1: INTRODUCTORY

Paragraphs

The growth of most towns may be divided into three stages. By the end of the formative stage, the period up to 1830–40, the street pattern of the central area and its neighbourhood had usually become fixed. 5–12

The stage of rapid growth (1840–1914), did not change the relationship of the central area to the rest of the town but led to a deterioration of living and working conditions within the central area. 13–15

Between 1920 and 1939—the motor transport stage—the number of mechanically propelled vehicles in Great Britain increased fourfold. By 1939 it was clear that the future prosperity of central areas of larger towns largely depended on the solution of the traffic problem. 16–21

War-damaged towns have special problems of redevelopment. In many cases their central areas were largely destroyed and they must consider simultaneously both long term and short term redevelopment problems. They have, however, the advantage of diminished opposition to comprehensive redevelopment. 22–23

The aim of planned redevelopment is to ensure that all the activities suited to a central area can be carried on under good conditions and that the process of redevelopment causes the minimum disturbance and hardship. 24–26

CHAPTER 2: SURVEY

The survey needed to prepare a redevelopment plan for a central area varies greatly between towns. The handbook considers only the minimum survey needed in all towns. This may be divided into Local and Regional Survey. 27

I. LOCAL SURVEY

Local Survey includes information on floor space in use for each main purpose, both in 1939 and at the time of survey, and condition and probable future life of buildings. 28–51

The density of building accommodation may be simply expressed as the ratio between total floor space and land area—called the Floor Space Index. It is recommended that the measurement, comparison and control of the density of building accommodation should be made and exercised in terms of Floor Space Indices. 52–63

II. REGIONAL SURVEY

In addition to the Local Survey it will be necessary to collect information concerning the town's place in the surrounding region. This information—here called Regional Survey—should be such as will enable outline planning proposals to be prepared for the town as a whole. 66–67

CHAPTER 3: THE MAIN DECISIONS

I. USES AND USE ZONES

All building uses for which planning consent will be necessary can be placed within one or other of 13 groups. These 13 groups are listed in paras. 87–99 and *Appendix* I. Some building uses can be conveniently placed within a central area, while others have siting requirements which cannot be properly provided within a central area. Four, or in some cases, five, building uses are specially suitable for location with a central area: namely, shops; offices; wholesale warehouses; educational, recreational and public buildings; and, in some cases, light industrial buildings. 71–99

The use zones suitable for a central area are those which correspond to the four or five suitable building uses. These use zones are:

Zone 2 Business (Shops)
Zone 3 Business (Offices)
Zone 4 Business (Wholesale Warehouses)
Zone 5 Educational, Recreational and Public Buildings

and, in some towns,

Zone 6 Light Industrial. 100

Shops and offices have different siting requirements and it is recommended that in larger towns the plan should provide for the location of the majority of shops and offices in separate zones. 107–113

In many towns a zone or zones to accommodate a proportion of the public buildings and places of assembly is likely to prove desirable. 116–119

II. THE AMOUNT AND DISTRIBUTION OF ACCOMMODATION

The proposed density of building accommodation will control the size of the central area and, perhaps more than any other single factor, its efficiency and convenience. 124–125

If the redevelopment plan is to be successful, suitable Floor Space Indices must be decided for all street blocks and developers must be required to adhere to them. If this is not done, accommodation may become concentrated in one portion of the central area and lead to a breakdown of the traffic system and of the whole plan. 138

Paragraphs

The Floor Space Index applying to an individual building plot would leave the developer free to decide whether to build a high building on a small portion of his plot or a low one covering most of the plot. So far as practicable, this freedom should be preserved, but it must not result in a new building depriving any building on a neighbouring plot of its fair share of daylight. The handbook recommends the adoption by Planning Authorities of a new system of daylighting control, which will prevent buildings overshadowing one another, and at the same time preserve for developers considerable freedom as regards the block form of their buildings. 162–166

III. THE MAIN STREET LAYOUT

The plan must provide for traffic circulation, including waiting and parking of vehicles, on a scale likely to meet the needs of all persons and vehicles having business in the central area. The road system should, in general, be designed to take twice the pre-war volume of traffic. 168–176

For most planning purposes it is sufficient to group roads or streets within one or other of three classes: Principal Traffic Roads; Main Streets; and Minor Streets. 173–174

In some towns an Inner Ring Road (which need not be circular on plan) should form the boundary of the central area, and the choice of the most suitable line for this road is of great importance. 177–178

Careful attention should be given to the routeing of public service vehicles and their stopping places. 179–183

The requirements of a successful shopping centre cannot be fulfilled in streets which are also main traffic routes. Traffic not having an origin or destination in the central area should be diverted from that area. New streets are likely for the most part, to run through obsolete or under-developed areas, and should be designed to draw traffic from existing main streets. In general, the new street system should comprise a careful improvement and opening-up of the existing streets rather than a completely new system. Full use should be made of the advantages obtainable by changes in the lay-out of minor streets. 187–193

Liberal provision should be made in central areas for car parking and parks should be well distributed. 194

CHAPTER 4: LAYOUT & DEVELOPMENT

I. STREET LAYOUT

All streets within the central area will be either Main Streets or Minor Streets and no Minor Street should lead directly into a Principal Traffic Road. 197

A Schedule has been prepared giving the minimum widths desirable for different classes of street but these minima should not become standard widths. 198–199

Paragraphs

A suitable number of pedestrian ways providing short cuts should be introduced. Some of these might be located and laid out for development with shops. 204

II. CAR PARKS

The distribution of car parks should be carefully considered and a greater number of small car parks is preferable to a few large ones. In larger towns consideration should be given to the provision of car parks below ground level or in multi-storeyed buildings. In towns where pedal cycles are much used, provision should be made for parking them under cover. 207–214

III. THE LAYOUT OF STREET BLOCKS

The proposed new street blocks should be of good shape and not too small in size. This will require the introduction of some new streets and the elimination or re-alignment of existing streets. A smooth traffic flow requires that the number of street intersections should be the minimum which will enable convenient access to be obtained to all premises. Street blocks, especially in the shopping zone, should be of varying depth and they should be capable of sub-division in a number of ways. 216–219

The layout plan should distinguish clearly which streets are intended for shopping frontages. Developers should make provision for the loading and unloading of goods vehicles within plot boundaries wherever a large quantity of goods is likely to be handled. 220–225

In general, it will be desirable for office redevelopment in central areas to take place in larger units than has been customary in the past, and Planning Authorities should encourage suitable groups of developers to consider the development of their several plots as part of a single building project. 226–231

IV. CONTROL OF THE EXTERNAL APPEARANCE OF BUILDINGS

The aim of control of the external appearance of buildings by the Planning Authority is to secure that there should be a reasonable balance and harmony in the layout, general form and colour of the buildings as a whole. 235

A wisely exercised control of external appearance should allow individual developers considerable freedom of decision concerning the block form and height of their buildings and at the same time ensure that the composition and general effect of a street would possess both balance and a reasonable measure of continuity and cohesion. The Planning Authority should be advised in these matters by a competent architect. 236–238

Control of external appearance by the Planning Authority can never be an effective substitute for the employment of competent architects by individual developers. 240

Paragraphs

V. OPEN SPACES AND STREET PLANTING

The central area should contain a well-distributed system of small open spaces suitable for use during the lunch hour. There is great scope for ingenuity in the location and design of these open spaces. 241–245

CHAPTER 5: THE GUIDANCE OF REDEVELOPMENT

The actual process of redevelopment will require most skilful guidance especially in the early stages in war-damaged towns. There should be regular meetings between the planning officer and other officials concerned to ensure careful balancing of the factors involved by each main step of the redevelopment plan.

The complete plan should be divided into stages which can each be regarded as a self-contained operation and yet prepare the way for the next stage. 246

I. THE FIRST STAGE OF REDEVELOPMENT

In general the plan should aim to open up and improve established centres rather than remove them, and should not involve a conflict in major matters between immediate and long-term needs. A difficult decision in the first stage of redevelopment concerns the allocation of available building labour and materials. 247

Temporary development as an emergency operation which is distinct from later permanent development is open to serious objections. Temporary development should be regarded as part of the general process of redevelopment and its location should conform to the use zones laid down in the plan and to the proposed lines of new streets. 248–254

In most war-damaged central areas accommodation suitable for shops and offices seems to be most urgently needed.

Constructional work should be planned to minimise disturbance to adjoining occupiers. Where a war-damaged area is large, the Planning Authority is recommended to subdivide it for reconstruction purposes into two or more smaller areas to be redeveloped in turn. Since high values will probably settle on the first commercial buildings to be erected, these should be located in groups at some distance from each other. 255–259

II. LATER STAGES OF REDEVELOPMENT

The second stage of redevelopment will largely be confined to areas occupied by obsolete buildings, which should be replaced directly other accommodation can be found for their occupants. The execution of civil engineering works will probably form a large part of it. 260–265

In the early years of rebuilding it will be necessary to maintain a reserve of free land to allow for reshuffling.

Plans should be prepared for each stage of redevelopment, and should be compared with plans showing achievement in periods allocated for earlier stages.

III. STAGES OF REDEVELOPMENT WITHIN STREET BLOCKS

The prompt redevelopment of each site after disposal will have considerable influence on the rate of development of neighbouring sites. 266–270

APPENDIX 1

GROUPS OF BUILDING USES

1. The 13 groups of building uses described below are intended to include all forms of development required in a town.* *Appendix* 2 contains a list of a large number of types of land or building uses, with the appropriate building use group indicated for each. If any building type does not appear in *Appendix* 2 the Planning Authority should decide to which group it properly belongs.

2. In the following paragraphs the types of building, which should be included in a particular group are defined by words or by a list of the types of building which are considered to fall within the group. In the latter case a risk exists that the list is incomplete, and Planning Authorities should therefore consider the list as a guide rather than as applicable in all areas without alteration. It is requested that the Ministry's attention should be drawn to any omissions in the list.

3. A particular building development may fall within more than one use group—for example, a building containing offices over a shop—and its location may call for special consideration on this account.

GROUP A. DWELLING HOUSES

4. A dwelling house is a house designed for use as a dwelling by a single family, together with such outbuildings as are ordinarily used therewith (1), (2).

Notes: (1) A dwelling house occupied as a dwelling but also used only by the occupier for a profession or occupation is included in this definition, provided it is not used in any way as an industrial building of any kind, or for the sale or public display of goods, or for the storage of bulky equipment or materials used in the occupier's profession or trade.

(2) A residence over a shop should be considered to fall within Group B: Residential Buildings (other than Dwelling Houses).

GROUP B. RESIDENTIAL BUILDINGS
(other than dwelling houses)

5. A residential building is a building other than a dwelling house or residential school or college, designed for, or containing provision for, human habitation, together with such outbuildings as are ordinarily used therewith. The group includes:

Approved Home for Mental Defectives (3).
Boarding House.
Certified House or Institution (3)
Club, Residential.
Convalescent Home.
Flats, Block of.
Hospital.
Hostel.
Hotel, licensed, private or unlicensed (4).
Institution, Public Assistance (residential).
Nursing Home.
Sanatorium.

Notes: (3) Under the Lunacy and Mental Treatment Acts.

(4) Under the Licensing Planning Act 1945, where an area has suffered extensive war damage, the Home Secretary may declare the area a Licensing Planning Area. The siting of all licensed premises in such areas is determined by a committee comprising an independent chairman and representatives of the licensing justices and local Planning Authorities.

GROUP C. SCHOOLS AND RESIDENTIAL COLLEGES

6. This group comprises residential and non-residential schools for children and residential colleges for adults (5).

Notes: (5) Non-residential colleges for adults are included in Group H.

GROUP D. SHOPS

7. A shop is a building designed for the purpose of carrying on retail trade (6), (7), (8), (9).

Notes: (6) For planning purposes retail trade is considered to include the provision of certain services as well as the sale of goods. Shops thus include:

Bar, Licensed (4) or Milk.
Café.
Cleaners and Dyers.
Department Store.
Hairdresser.
Public House (4).
Restaurant.
Retail Market.
Ticket Office, Railway or Theatre.

(7) A workshop on the same premises as and incidental to the conduct of a retail business is included in this definition. Whether or not a building use should be included in this group or in Group K: Industrial Buildings or Group J: Light Industrial Buildings must often depend on the scale or nature of the operations intended to be carried on. For example, a small bakery attached to a retail shop may be held to fall within Group D, whereas a large bakery should be put under K. Similarly a small pressing and cleaning establishment may come within Group D whereas a large one should come under K.

(8) Garages and petrol filling stations may be allowed in any zone, but the Planning Authority should consider their type and size in relation to the zones for which they are proposed. For instance, a large repairing garage would not be suitable in a residential zone.

(9) It should be noted that post offices and banks, placed within Groups H and E respectively, are liable to break the continuity of shop front displays in shopping streets (see para. 103). This may also occur in the case of motor-car showrooms where these form part of a repairing garage or petrol filling station, or where there is much movement of vehicles across the footways.

GROUP E. OFFICES

8. This group is primarily intended to comprise offices other than public offices (10). The group includes:

Bank (9).

* See footnote to para. 72 of the handbook.

Exchange, Stock or Produce.
Office.
Storage Yard (11).

Notes: (10) Local and central Government offices are included in Group H.

(11) This use is also included in Group G. The group into which storage yards should be put is almost entirely a question of size. A small yard used for the storage of a builder's plant may suitably be allowed among office buildings.

GROUP F. WHOLESALE WAREHOUSES

9. A wholesale warehouse is a building designed both for the storage of goods and the transaction of business, other than retail business, related to such goods (12).

Notes: (12) See paras. 114–115 of the handbook.

GROUP G. STORAGE WAREHOUSES

10. The group includes:
Builder's or Contractor's Yard (11).
Furniture Depository.
Grain Silo.
Local Authority's Depot (11).
Storage Warehouse.
Storage Yard (11).
Transit Warehouse.

GROUP H. PUBLIC BUILDINGS AND PLACES OF ASSEMBLY

11. The group includes:
Art Gallery.
Baths, Public.
Bath, Swimming.
Billiard Saloon (14).
Central Government Office.
Chapel.
Church.
Cinema (14).
Clinic (including Animal Clinic).
Club, non-residential.
College, non-residential (5).
Community Centre.
Concert Hall.
Court, Law (14).
Creche.
Dance Hall (14).
Dispensary.
Exhibition Hall (14).
Fire Station.
Gymnasium.
Health Centre.
Institution, Learned Society's (14).
Institution, Professional (14).
Labour Exchange.
Lecture Hall (14)
Local Government Office (14).
Meeting House.
Museum.
Music Hall (14).
Nursery, Day (13).
Oratory
Police Station.
Post Office.
Public Hall (14).
Public Library.
Skating rink (14).
Social Centre.
Squash Rackets Court.
Sunday School.
Technical College or Institute (5), (14).
Theatre (14).
University building (5), (14).

Notes: (13) Nursery schools are included in Group C.

(14) These buildings should not normally be permitted in Zone 1 (Residential) unless they are small local institutions.

GROUP I. SPECIAL PLACES OF ASSEMBLY

12. The group includes:
Amusement Hall.
Athletic ground (15).
Fair booth.
Football ground (15).
Fun Fair.
Racecourse or track.
Sports ground (15).
Stadium.

Notes: (15) Sports grounds included in this group are those to which the public are regularly admitted for payment; grounds attached to schools or belonging to clubs and firms, and not primarily intended as places of public entertainment, may be allowed in any zone.

GROUP J. LIGHT INDUSTRIAL BUILDINGS

13. A light industrial building is an industrial building (16) in which no solid fuel is used in connection with any industrial process and in which the only power-driven machinery used is that driven by electricity, no single motor being rated at more than 10 horse power (7), (17), (18).

Notes: (16) An industrial building is defined under Group K below.

GROUP K. INDUSTRIAL BUILDINGS

14. In general, an industrial building for planning purposes is a building, other than a light industrial building or special industrial building, which comes within the definition of a factory in Section 151 of the Factories Act, 1937 (7), (17), (18).

Notes: (17) Factories are also included in Group J: Light Industrial Buildings and Group L: Special Industrial Buildings. The group to which a particular building properly belongs depends on the nature of the processes carried on within it.

(18) Large film studios with sets, etc. should be regarded as industrial buildings. A single studio attached to business premises may be regarded as part of such premises and therefore as coming within Group E.

GROUP L. SPECIAL INDUSTRIAL BUILDINGS

15. The following types of buildings are special industrial buildings:

(i) Any building designed for use as a work which is registrable under the Alkali, etc. Works Regulation Act, 1906, or any statute amending or repealing that Act.

(ii) Any building designed for use as or for one or more of the following works or processes in so far as any such work or process is not registrable under the

Alkali, etc. Works Regulation Act, 1906, or any statute amending or repealing that Act, viz:

Brick kilns, lime kilns, coke ovens, salt glazing works, sintering of sulphur bearing materials, distilling, refining, or blending of oils, stone crushing or screening plants for the preparation of road surfacing materials.

Smelting of ores and minerals, calcining, puddling and rolling of iron and other metals, conversion of pig iron into wrought iron, re-heating, annealing, hardening, forging, converting and carburising iron and other metals, galvanizing, recovery of metal from scrap, pickling or dissolution of metal in acid, chromium plating.

Works for the production of, or which employ, cellulose lacquers, cyanogen or its compounds, hot pitch or bitumen, pyridine, liquid or gaseous sulphur dioxide, sulphur chlorides, calcium carbide (19).

Works for the production of amyl acetate, aromatic esters, butyric acid, caramel, enamelled wire, glass, hexamine, iodoform, lampblack, B-naphthol, resin, products other than synthetic resin powders, salicylic acid, sulphonated organic compounds, ultra-marine, zinc chloride, zinc oxide, paint and varnish manufacture, excluding works at which only milling and blending are practised, production of rubber from scrap (19), (20).

(iii) Any building designed for the purpose of carrying on any of the following industries, businesses or trades, viz:

Animal charcoal manufacturer.
Blood albumen maker.
Blood boiler.
Blood drier.
Bone boiler or steamer.
Bone burner.
Bone grinder.
Breeder of maggots from putrescible animal matter.
Candle maker.
Catgut manufacturer.
Chitterling or nettlings boiler (not carried on as subsidiary to a retail trade or business).
Dealer in blood, skins, hides, or butchers' waste.
Dealer in rags and or bones (including receiving, storing, sorting or manipulating rags in or likely to become in an offensive condition, or any bones, rabbit-skins, fat or putrescible animal products of a like nature).
Fat melter or fat extractor.
Fellmonger.
Fish curer (not carried on by a fishmonger as subsidiary to his trade or business as a fishmonger).
Fish oil manufacturer.
Fish skin dresser, or scraper.
Glue maker.
Gut scraper or gut cleaner.
Leather dresser.
Maker of meal for feeding poultry, dogs, cattle, or other animals from any fish, blood, bone, fat or animal offal, either in an offensive condition or subjected to any process causing noxious or injurious effluvia.
Manufacturer of manure from bones, fish, fish offal, blood, spent hops, beans or other putrescible animal or vegetable matter.
Parchment maker.
Size maker.
Skin drier.
Soap boiler.
Tallow melter or refiner.
Tanner.
Tripe boiler or cleaner.

Notes: (19) Notwithstanding the provisions of these paragraphs, garages in which car-spraying is carried on in connection with minor repairs shall not be deemed special industrial buildings on that account.

(20) Many of the works and processes mentioned in para. 15 (ii) are injurious on planning grounds only where the methods employed give rise to excessive noise, smoke, gaseous or other effluents, and where the Development Authority are satisfied that these conditions will be prevented by the installation of suitable equipment, they may regard the building as an industrial and not as a special industrial building.

GROUP M. OTHER BUILDINGS (21)

16. The group comprises all land and building uses which do not fall within one or other of the 12 groups A to L. Among such other buildings are the following:

Aerodrome.
Agricultural Building.
Building for the armed forces.
Bus Garage.
Bus Station.
Cemetery.
Crematorium.
Electricity Sub-Station.
Garage, Lock-up.
Lavatory, Public.
Memorial or Monument.
Prison or Borstal Institution.
Pumping Station.
Railway Premises.
Refuse Destructor.
Sewage Works.
Telephone Exchange.
Tram Depot.
Water Works.
Wireless or Television Building.

Notes: (21) It will be necessary to consider the size and extent and other characteristics of each of these building uses when determining their admission to any zone.

APPENDIX 2

INDEX TO THE BUILDING USE GROUPS TO WHICH COMMON TYPES OF BUILDINGS BELONG

ABATTOIR	K
AERODROME	M
AGRICULTURAL BUILDING	M
AIRPORT	M
AMUSEMENT HALL	I
APPROVED HOME FOR MENTAL DEFECTIVES	B
APPROVED SCHOOL	C
ARMED FORCES' BUILDING	M
ART GALLERY	H
ATHLETIC GROUND	I
AUCTION ROOM	E
BAKERY	D or K
BANK	E
BAR, LICENSED OR MILK	D
BARRACKS	M
BATHS, PUBLIC	H
BATH, SWIMMING	H
BILLIARD SALOON	H
BOARDING HOUSE	B
BOATHOUSE	M
BORSTAL INSTITUTION	M
BOTANICAL GARDEN	M
BREWERY	K
BUILDERS' OR CONTRACTORS' YARD	E or G
BUREAU, ENQUIRY OR TRAVEL	D
BUREAU DE CHANGE	D
BUS GARAGE	M
BUS STATION	M
CAFÉ	D
CEMETERY	M
CENTRAL GOVERNMENT OFFICE	H
CERTIFIED INSTITUTION	B
CHAPEL	H
CHURCH	H
CINEMA	H
CLEANERS' AND DYERS'	D
CLINIC (INCLUDING ANIMAL CLINIC)	H
CLUB, NON-RESIDENTIAL	H
CLUB, RESIDENTIAL	B
COLLEGE, NON-RESIDENTIAL	H
COLLEGE, RESIDENTIAL	C
COMMUNITY CENTRE	H
CONTRACTOR'S YARD	E or G
CONVALESCENT HOME	B
CONVENT	B or C
COUNTY COURT	H
COURT, LAW	H
COURT, POLICE	H
CRECHE	H
CREMATORIUM	M
DAIRY	D
DANCE HALL	H
DAY NURSERY	H
DEPARTMENT STORE	D
DEPOT, LOCAL AUTHORITY'S	E or G
DESTRUCTOR, REFUSE	M
DISPENSARY	H
DWELLING HOUSE FOR SINGLE FAMILY	A
EDUCATIONAL CENTRE	H
ELECTRICITY POWER STATION	K
ELECTRICITY SUB STATION	M
ENQUIRY BUREAU	D
EPILEPTICS, SCHOOL FOR	C
EXCHANGE, LABOUR	H
EXCHANGE, PRODUCE	E
EXCHANGE, STOCK	E
EXCHANGE, TELEPHONE	M
EXHIBITIONS, HALL FOR	H
FACTORY	J, K or L
FAIR BOOTH	I
FILLING STATION	D
FILM STUDIO	E or K
FIRE STATION	H
FLATS, BLOCK OF	B
FOOD OFFICE	H
FOOTBALL GROUND	I
FUN FAIR	I
FURNITURE DEPOSITORY	G
GAMES, BUILDING FOR	H
GARAGE	D or K
GARAGE, LOCK-UP	M
GAS WORKS	K
GOVERNMENT OFFICE	H
GRAIN SILO	G
GYMNASIUM	H
HAIRDRESSER	D
HALL, AMUSEMENTS	I
HALL, CONCERT	H
HALL, DANCE	H
HALL, FOR EXHIBITIONS	H
HALL, FOR TRADE EXHIBITIONS	H
HALL, LECTURE	H
HALL, MUSIC	H
HEALTH CENTRE	H
HOME, APPROVED FOR MENTAL DEFECTIVES	B
HOSPITAL	B
HOSPITAL, MENTAL	B
HOSTEL	B
HOTEL, LICENSED, PRIVATE & UN-LICENSED	B
HOUSE, BOARDING	B
HOUSE, MEETING	H
HOUSE, PUBLIC	D
INSTITUTE, TECHNICAL	H
INSTITUTION, CERTIFIED	B
INSTITUTION, LEARNED SOCIETY'S OR PROFESSIONAL	H
INSTITUTION, PUBLIC ASSISTANCE (RESIDENTIAL)	B
LABOUR EXCHANGE	H
LAUNDRY	K
LAVATORY, PUBLIC	M
LEARNED SOCIETY'S INSTITUTION	H
LECTURE HALL	H
LIBRARY, PUBLIC	H
LICENSED PREMISES (NON-RESIDENTIAL)	D
LOCAL AUTHORITY'S DEPOT	E or G
LOCAL GOVERNMENT OFFICE	H
LOCK-UP GARAGE	M
MARKET GARDEN	M
MARKET, RETAIL	D
MARKET, WHOLESALE	F
MATERNITY HOME	B
MEETING HOUSE	H
MEMORIAL	M

MENTAL DEFECTIVES' APPROVED HOME	B
MENTAL DEFECTIVES' SCHOOL	C
MENTAL HOSPITAL	B
MONASTERY	B or C
MONUMENT	M
MORTUARY	M
MOTOR-CAR SHOWROOM	D
MUSEUM	H
NON-RESIDENTIAL CLUB	H
NURSERY, DAY	H
NURSERY, HORTICULTURAL, ETC.	M
NURSERY SCHOOL	C
NURSING HOME	B
OBSERVATORY	M
OFFICE	E
OFFICE, CENTRAL OR LOCAL GOVERNMENT	H
ORATORY	H
PETROLEUM FILLING STATION	D
POLICE STATION	H
POST OFFICE	H
POWER STATION	K
PRIMARY SCHOOL	C
PRISON	M
PRIVATE HOTEL	B
PRODUCE EXCHANGE	E
PROFESSIONAL INSTITUTION	H
PUBLIC ASSISTANCE INSTITUTION (RESIDENTIAL)	B
PUBLIC HOUSE	D
PUBLIC LIBRARY	H
PUMPING STATION	M
RACE COURSE	I
RACING TRACK	I
RAILWAY PREMISES	M
RAILWAY STATION	M
REFUSE DESTRUCTOR	M
RESTAURANT	D
RETAIL MARKET	D
RINK, SKATING	H
SALOON, BILLIARD	H
SANATORIUM	B
SCHOOL, APPROVED	C
SCHOOL, PRIMARY	C
SCHOOL, SECONDARY	C
SCHOOL FOR EPILEPTICS	C
SCHOOL FOR MENTAL DEFECTIVES	C
SECONDARY SCHOOL	C
SEWAGE WORKS	M
SHOP	D
SHOWROOM FOR MOTOR-CARS	D
SLAUGHTERHOUSE	K
SOCIAL CENTRE	H
SPECIAL INDUSTRIAL BUILDING	L
SPECIAL SCHOOL	C
SPORTS GROUND	I
SQUASH RACKETS COURT	H
STADIUM	I
STATION, BUS	M
STATION, RAILWAY	M
STOCK EXCHANGE	E
STORAGE WAREHOUSE	G
STORAGE YARD	E or G
STORE, DEPARTMENT	D
SUB-STATION ELECTRICAL	M
SUNDAY SCHOOL	H
SWIMMING BATH	H
TECHNICAL INSTITUTE	H
TELEPHONE EXCHANGE	M
TELEVISION BUILDING	M
THEATRE	H
TICKET OFFICE, RAILWAY OR THEATRE	D
TRADE, EXHIBITION HALL FOR	H
TRAINING COLLEGE	C
TRAM DEPOT	M
TRANSFORMER STATION	M
TRANSIT WAREHOUSE	G
TRAVEL BUREAU	D
UNIVERSITY BUILDINGS	H
WAREHOUSE, TRANSIT	G
WAREHOUSE, WHOLESALE	F
WASH HOUSE	H
WATER WORKS	M
WHARF	M
WIRELESS BUILDING	M
WORKSHOP	D or J
ZOOLOGICAL GARDENS	M

APPENDIX 3

THE DAYLIGHTING OF BUILDINGS

I. INTRODUCTORY

1. It has been stated in Chapter 3 of this handbook (paras. 162–166) that the Ministry has evolved a method of daylighting control that will allow a reasonable standard of daylight in all buildings which contain a normal number of windows of reasonable size.* Before the size of windows comes to be considered, it is necessary to know whether a proposed arrangement of buildings on a site is likely to afford good daylighting conditions, provided that windows of reasonable number and dimensions are used, or whether the buildings will obstruct each other's daylight or that of buildings which may be built on neighbouring sites. With the assistance of the Building Research Station the Ministry has evolved a method of testing layout plans of proposed buildings for this purpose by means of pivoting "permissible height indicators" (hereinafter referred to as indicators), shown in Fig. 95.

2. The design of the indicators takes account of the fact that light may reach a window either over the top of an obstruction in front of the window or from a direction to one side of the obstruction. The width of the gap at the side of the obstruction through which the light comes has been related to the steepness of the angle at which the light is descending; so that, for a given standard of daylighting, the flatter the angle of descent the less may be the width of the gap. This method of testing daylight obstruction is more realistic and gives more latitude to the architect than methods which relate only to daylight coming over uniformly high (i.e. horizontal) obstructions. The method can be applied to building plots of any size and surroundings, but its full benefits cannot be obtained on a small plot. It therefore favours redevelopment in which the daylighting requirements of all buildings within the street block have been considered as part of a single design.

3. The tests described below are designed to provide a standard of daylight which is a reasonable minimum for offices (see para. 164 above). The tests should be applied in all business zones, in educational, recreational and public buildings zones (Zone 5), and in all industrial zones except in areas where the industrial processes carried on render the tests unsuitable. Since no areas of the latter kind should be in central areas, the tests should be applied throughout central areas.

4. The tests are of two kinds. The first series of tests is designed to test the boundaries of a building plot to prevent buildings to be erected thereon obstructing the daylight of buildings which exist or may later be built on neighbouring sites. For these tests, described in paras. 7–24 below, the A indicators should be used (see Fig. 95). The second series of tests is to prevent the obstruction of each other's daylight by buildings within the same plot. For these tests, described in paras. 25–33 below, the C indicators should be used (see Fig. 95).

Construction of indicators.

5. The indicators should be drawn on tracing paper or other transparent material to the scale of the plan to be examined. The lines PA, PB, PC, and PD should be drawn at the angles indicated in Fig. 95, PE should be measured along PC and is the horizontal distance in feet from the point P to the point where the permissible height is 100 feet. The horizontal distance PE for each indicator is shown on Fig. 95. PE should be divided into 10 equal parts to show the points at which the permissible height is 10, 20, 30, etc. feet up to 100 feet at E. Arcs of a circle should then be struck to subdivide a portion of the line PB in the same manner as PE.

6. The following information about the indicators is of general interest, but is not necessary for drawing or using the indicators:

	P.E. in Feet
A1 is based on an angle of elevation of 60 degrees	58
A2 is based on an angle of elevation of 55 degrees	70
A3 is based on an angle of elevation of 50 degrees	84
A4 is based on an angle of elevation of 45 degrees	100
C1 is based on an angle of elevation of 40 degrees	119
C2 is based on an angle of elevation of 35 degrees	143
C3 is based on an angle of elevation of 30 degrees	173
C4 is based on an angle of elevation of 25 degrees	214

Notes:

(i) PE is the horizontal distance from the point P to the point where the permissible height is 100 feet.

(ii) It will be observed that, for each set of indicators, the higher the angle of elevation the wider the angle on plan over which the access of daylight is measured.

(iii) The A series angles are higher than the C series because, in the former case, the angles are measured from the street centre line or plot boundary towards the building which may cause an obstruction; whereas, in the latter case, they are measured from the outside walls of the actual building which may be obstructed towards the building which may cause an obstruction. In the C series therefore the vertical angles must be lower than in the A series to maintain the same standard of daylighting.

(iv) It will also be noticed from an examination of the indicators that light coming along a line which makes a horizontal angle of less than 45 degrees with the face of a window is ignored when testing buildings within the same plot for mutual obstruction. (Series C indicators.) When testing street fronts or plot boundaries, this angle is reduced to 25 degrees (Series A indicators), since it may be assumed that the street centre line or plot boundary is about midway between the two buildings under consideration.

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* See Bibliography, No. 22, for details of tables prepared by the National Physical Laboratory to assist designers of domestic buildings to choose windows of the right size to provide a desired standard of daylighting. The same principles may be used in considering the right sizes of windows for offices.

II. TESTING STREET FRONTS AND OTHER BOUNDARIES OF A PLOT

(For these tests the A1, A2, A3, or A4 indicators (Fig. 95) should be used.)

7. When the building plot is small the permissible height of buildings on it will be governed by a test with the indicator A1. The heights permitted by this indicator will enable accommodation up to a Floor Space Index of about 2·5 to be provided, and this will be found sufficient to meet all ordinary needs. If in the central areas of large towns a higher Floor Space Index is considered necessary, redevelopment should be planned in reasonably large units. When applied to such a unit the tests permit a range of variation in the heights of the various blocks composing the unit which should enable any desirable Floor Space Index to be obtained. In no case should daylighting tests be waived or the standard relaxed.

8. In testing for possible obstruction, by buildings on a plot, of the daylight of buildings which exist or may later be built on neighbouring plots, it will be necessary to test (1) the centre lines of the street or streets which adjoin the plot and (2) the boundary lines of the plot where these do not adjoin a street. As regards (1), all points on that portion of the street centre line which is opposite the plot should be examined by means of the indicators A1, A2, A3 or A4. As regards (2), all points on the actual plot boundary line should be similarly examined, subject to the exceptions in paragraphs 12 and 14 below. The four tests made by the use of the indicators are alternative; at each point on the street centre line or boundary being examined one or other of the four tests must be satisfied. (Note: figures on the indicator are heights not distances.)

Indicators A1, A2, A3, A4.

9. To use any one of the indicators A1, A2, A3, or A4 place the point P on the point on the street centre line or plot boundary which is being examined. With the point P fixed, the indicator may be rotated in either direction, provided that neither the line PA nor PD crosses the line being examined. To pass the test, it must be possible to place the indicator in one position between these limits so that the height of any building on the plot, at the points where it is crossed on the plan by either of the lines PB or PC, is not greater than the height shown on the indicator.

Height Datum.

10. The heights used in the tests are heights above ground floor level at the point P. The location of this point of course changes with each test.

Special Conditions and Exceptions.

11. Street facades and side boundaries. Where the Planning Authority has decided to permit a continuous facade to be erected along a street, the portion of the side boundaries of a plot within 50 feet of the building line (or, if no building line has been fixed, within 50 feet of the street boundary) shall be exempted from examination.

12. In testing street fronts where a continuous facade has been allowed, indicators should not be used in such a way as to assume that light will come over a building on the frontage of a neighbouring plot.

13. Single storey buildings. When examining plot boundaries, single storey buildings not more than 15 feet high may be ignored.

Two or more plots developed as part of one design.

14. When an area of land comprising a number of plots or street blocks is to be developed in accordance with a single comprehensive design, the whole area may be treated for purposes of daylight tests as though it were a single plot. The centre lines of streets within such an area need not be examined.

EXAMPLE 1. Examination of the boundaries of a plot.

A. Testing the street centre line.

15. Fig. 96 shows a building plot RUXF on which it is proposed to erect a building comprising three blocks—100, 30 and 14 feet high.

16. The centre line of the street (QG) adjoining the plot should first be examined, beginning at G. If the indicator A1 is set with P on H and PA along HG, the permissible height where the indicator crosses the edge (LF) of the 30 foot high block is about 47 feet. The 30 foot high block therefore passes the test along the line LF.

17. But when the indicator A1 is moved along the line GQ until P falls on I, the permissible height for the 100 foot high block at N is about 88 feet. The face MN of the 100 foot high block therefore will not pass the test imposed by the indicator A1. One of the three indicators A2, A3, or A4 should therefore be tried.

18. The three indicators are not intended to be tried in sequence. Each is the most suitable in particular circumstances, which will be readily recognized after a little practice. For testing daylight reaching I past the 100 foot high block, A4 is likely to prove suitable, since the horizontal angle between its arms PB and PC is small (15 degrees) and its angle of elevation (45 degrees) is likely to clear the face RF. If A4 is placed with P on I and rotated to test for light coming past the 100 foot high block at M, the point I will be found to pass the test. The arms PB and PC of A4 pass through points B^1 and C^1 which are both 50 feet from RF and the permissible height at C^2 on RF is about 37 feet.

19. If the point I thus passes A4 for light coming past M, it is probable that all other points on IJ will pass. In order to make sure whether this is the case the indicator A4 should be moved along IJ until P falls on J. The permissible height where PC crosses the face RF at C^3 will be found to be about 35 feet. Therefore all points on IJ pass the test.

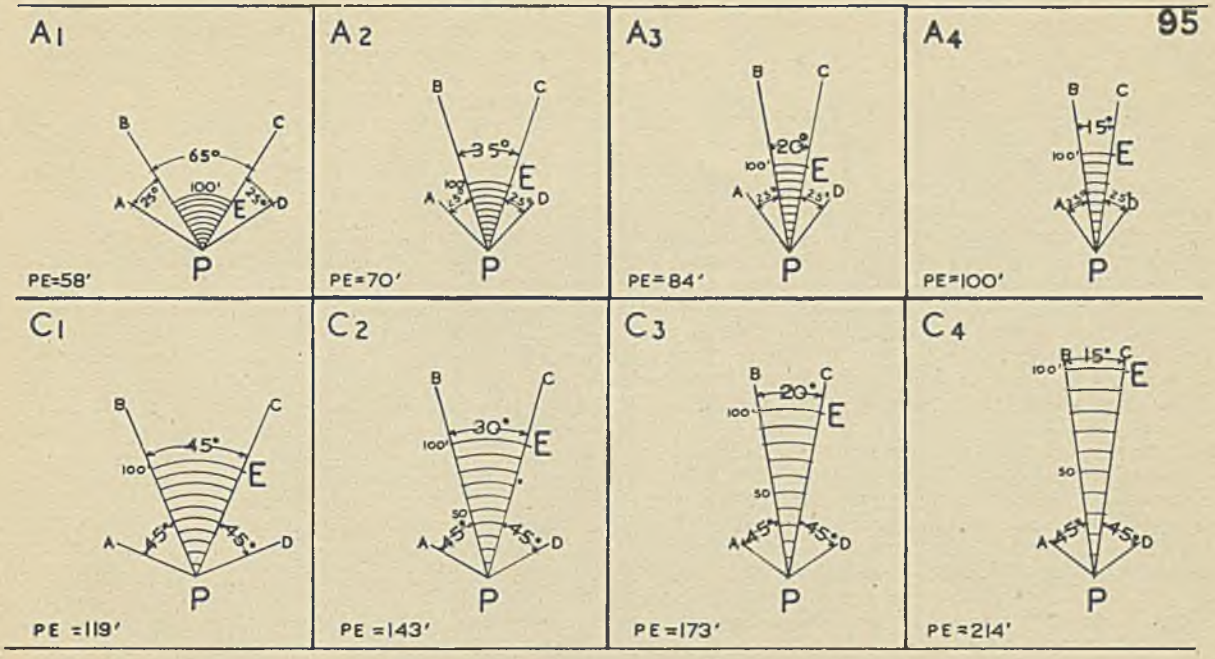
20. It may be noted that all points on IJ will also pass the test using indicator A3, if this indicator is set with P on the centre line of the 100 foot high block and is rotated first to the right and then to the left. All points on IJ will not, however, pass using indicator A2.

21. The remaining portion (JQ) of the street centre line QG will pass using indicator A1 and therefore the whole of the street centre line has passed the tests.

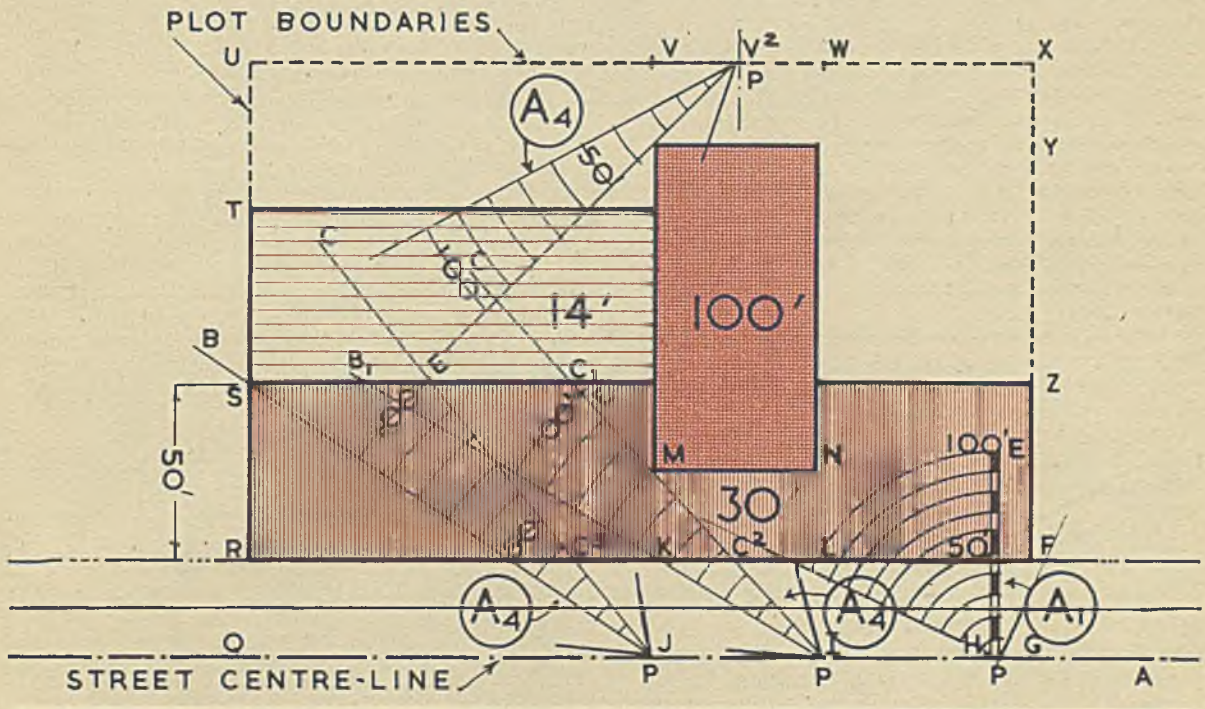
B. Testing plot boundaries other than the street front boundary.

22. The plot boundaries, RU, UX and XF may then be tested in turn. The portion RS need not be tested as Fig. 96 shows a building in a street where continuous facades are permitted (see para. 11 of this *Appendix*). The block adjoining ST is less than 15 feet high and may therefore be ignored (see para. 13 of this Appendix) and ST will pass as regards the 100 foot block by using A1. All points on TU pass using indicator A1.

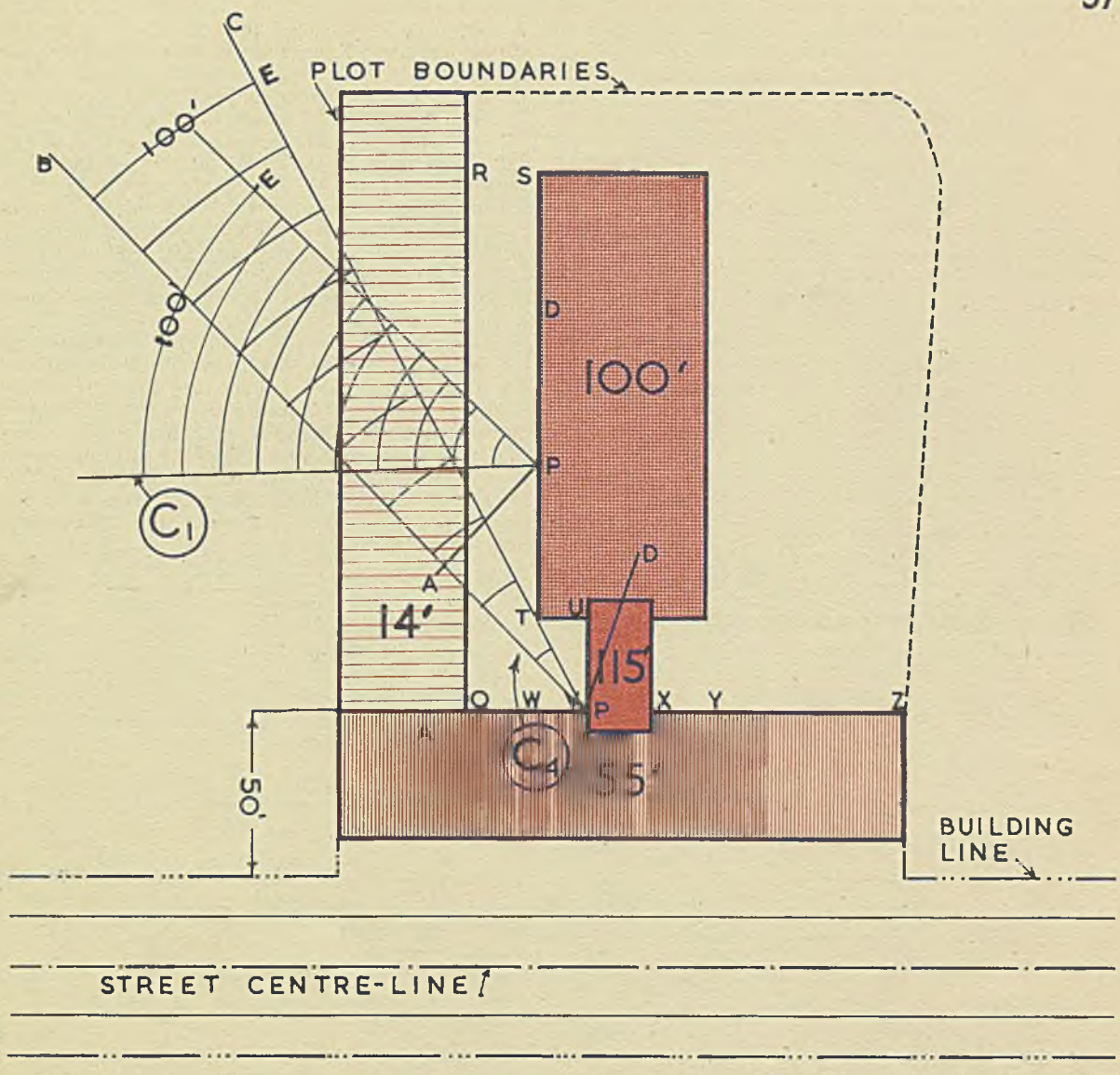
23. All points on UX will also pass using indicator A1 except points between V and W. If the indicator A4 is set with P on V2 (the centre line of the 100 foot high



THE DAYLIGHTING OF BUILDINGS *indicators for testing*



DAYLIGHT TESTS OF THE BOUNDARIES OF A PLOT



DAYLIGHT TESTS APPLIED TO BUILDINGS ON THE SAME PLOT

block) the point V2 passes the test. Therefore all points between V and W will pass the test. Points on WX and XZ pass the test using indicator A1. ZF does not need to be examined. (See para. 11.)

24. Therefore all the blocks on the plot RUXF pass the tests designed to ensure that the building will not obstruct the light of buildings which exist or may later be built on adjoining sites.

III. TESTING THE EXTERNAL WALLS OF BUILDINGS WITHIN THE SAME PLOT

(For these tests the indicators C1, C2, C3 or C4 (Fig. 95) should be used.)

25. In order to test whether any of the proposed buildings on a plot will obstruct the light of other buildings on the same plot, the outer face of each building which faces any other building should be examined by means of indicators C1, C2, C3 or C4. The four tests are alternative and if a point passes any one of the tests adequate daylight will reach that point.

26. To use any one of the indicators C1, C2, C3 or C4, place the point P on a point on the outside wall of a building. The indicator may be rotated about P providing that neither PA nor PD crosses the wall face under examination (i.e. neither A nor D may lie *inside* the building being examined). The permissible heights may then be read as described in para. 9 above.

Special conditions and exceptions.

27. Ends of Buildings: The examination of the end wall of a building by the C indicators need not be

made if the Planning Authority is satisfied that any offices or other working space adjoining the end wall can be properly lighted from windows in the side walls. (See TU in Fig. 97 and para. 31.)

28. No office rooms or other working spaces: When using the C series indicators, the permissible height given on the indicator is the height above ground level at the point P. But if there are no office rooms or other working space on the ground floor at P, the permissible height at the point which may cause obstruction may be increased by the height from ground level at P to the level of the lowest floor on which there are office rooms or other working space. (See para. 31 below.)

29. Buildings of which the daylighting has been the subject of special study: When the Planning Authority is satisfied that graded daylight factor tables,* a Waldram diagram or some other scientific method† has been used in the design of a group of buildings to ensure that their daylighting will be up to the standard specified in this handbook, examination for mutual obstruction by the C series indicators may be waived.

EXAMPLE 2. Examination of the external walls of buildings within the same plot.

30. Fig. 97 shows a plot containing a staircase block 115 feet high, 2 office blocks, 100 and 55 feet high and a single storey block used only for storage of goods which is 14 feet high. It is desired to examine the external walls of all rooms used as offices or other working space to see that one block does not obstruct the light of another.

31. Since the 14 foot high block is only to be used for storage the line QR need not be tested for obstruction by ST or UV. The next possibility is that light to ground floor offices behind the face ST may be obstructed by QR. A point on ST should therefore be tested with the indicator C1. The permissible height where PB cuts QR is about 17 feet. (See Fig. 97). Points on ST therefore pass this test. Points on the line TU (and the similar return on the other side of the staircase block) need not be examined as offices adjoining this face may be adequately lit from the face TS. (See para. 27. of this *Appendix*.) UV also need not be examined as the 115 foot high block contains no offices or other working spaces.

32. The remaining faces which call for examination are QV and XY, particularly the point V. If the indicator C4 is set with P on V and the arm PA (of C4) lying along QV, the arm PC just clears the point T and the permissible height where PB cuts QR is about 23 feet. The point V therefore passes the test. All other points on QV will also pass the test and so will points on XY.

33. Therefore no building on the plot obstructs the daylight of any office or other working space in any other building on the plot.

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* See Bibliography, No. 22.
† See Bibliography, No. 15.

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