SUMMARY

SECTION I. CONDITIONS

CHAP. 1. CONDITIONS DUE TO NATURE

The survey of the geographic conditions of the Stockholm region comprises an up-to-date report on the geology of the region by Erik Fromm, Lic. Ph. — Appendix A — and a review of the climatic conditions by Anders Ångström, Dr. Ph. — Appendix B. The geological conditions of special significance in the planning are the presence of loose ground layers. A chart of the nature of the ground is included as Plan I. The plan shows where there is danger of poor subsoil (1.1).

Hydrographic conditions affecting the planning comprise the supply of drinking water and the maintenance of bathing facilities in the Baltic and in some of the small lakes (1.2).

CHAP. 2. CULTURAL CONDITIONS

Particulars of vegetation, settlement and cultural relics are mainly to be found in »Stockholmstraktens natur- och kulturminnen» (Natural and Cultural Monuments of the Stockholm Region) issued by Stockholm Council for Civil Beauty (2.1—2.3).

Ownership of the land is dealt with on Plan II, which shows that the greater part of the undeveloped land in Stockholm is owned by the city itself and the Crown (2.4).

CHAP. 3. EXTENT OF GREATER STOCKHOLM

The term Greater Stockholm has been given various significations in different connections. This chapter furnishes the requisite definitions for this term as also of the expression Stockholm region. Since the re-distribution of 1st. January, 1952, Greater Stockholm has been divided into 29 urban and rural districts and the Stockholm Region into 47 such districts.

CHAP. 4. PRESENT SIGNIFICANCE OF GREATER STOCKHOLM FOR THE KINGDOM

The comparative discussion of trade and industry in Greater Stockholm and the other parts of the country is based on inquiries in the thirties and forties, chiefly W. William-Olsson's »Stockholms framtida utveckling» (Future Development of Stockholm). His figures go up to the year 1930, while we have had at our disposal the 1940 census and figures covering 1/12 of those engaged in trades and professions in Stockholm for 1945. Greater Stockholm's population developments are compared with developments in urban occupations throughout the country (4.1—4.2).

In the thirties, expansion in Greater Stockholm was not so great as during the twenties. This applies particularly to the large groups industry and trade. There were considerable changes in the occupational structure, but the thirties were not characterized by any special influx of workers to Greater Stockholm. The figures for those engaged in urban occupations proper were for Greater Stockholm 17.1 % in 1920, 18.7 % in 1930 and 19.3 % in 1940. The figures for subsequent years do not indicate any variation in tendency (4.3).

The rate of expansion in the thirties was greatest in the public administration group. This continued in the forties, and government administration appears to have grown very much more rapidly than local administration. Conditions were the same, however, in the other large towns of the country (4.41). The group of health and social services expanded strongly during the thirties but its expansion was considerably weaker in the early forties than, e. g., administration, and even less in Greater Stockholm than in the country generally (4.43). The increase in those engaged in literature and the arts has been extremely pro-

nounced. In the years 1943—44 almost half of the country's students at higher educational institutions were in Greater Stockholm. In recent years this development has changed to some extent. The press shows a strong and growing concentration to Stockholm (4.44).

Comparison between Stockholm, Gothenburg, Malmö and the rest of the kingdom shows a certain tendency to decentralization of wholesale trade. In total, the increase in Gothenburg and Malmö has been just as great as in Stockholm (4.45).

Increase in those engaged in the transport trades was strikingly small in the thirties. Figures since 1940 are not available. What increase has occurred was largely due to increase of undertakings for local transport (4.46).

The industry of Stockholm employs more administrative staff per worker than does industry in other parts of the country, and in Stockholm there are proportionately more small industrial establishments than in the country generally. In large and small industry the metal and building trades are predominant, with textiles and foodstuffs and the paper and graphic trades coming next. Developments in Stockholm, considered relatively, have been just as great as in the country generally. In the period 1930—45, Greater Stockholm had not more than 12.2 % and not less than 11.4 % of the kingdom's industrial workers. The absolute increase in the years 1940—45 was as great as the increase for the whole of the thirties. Considering developments in the different trades, it is found that the share of Greater Stockholm of the whole country's labour force in the typical Stockholm industries was on the decrease in the thirties and, though a certain recovery took place in the forties, it was only in the chemical industry that the share reached that of 1930. This is due to the metal industry and other branches of industry typical of Stockholm developing in other parts of the country still more strongly than in Stockholm (4.47).

It is not possible to make any real forecast regarding developments in trade and industry. Nevertheless, it seems possible to make some assumptions regarding probable trends of development. Those engaged in administration and the free professions may be assumed to continue to increase heavily, possibly 6 % per year. These, however, comprise no more than 1/6 of persons in occupations. The large occupational groups of trade, communications and industry with handicrafts can be expected to grow by about 2 % per annum. These represent about 3/4 of all earners. Thus the magnitude of the total increase of workers would be 2.5 %, equivalent at present to about 10,000 per annum (4.5).

CHAP. 5. POPULATION DEVELOPMENTS OF GREATER STOCKHOLM

Whereas in making population forecasts during the thirties and first half of the forties it was taken that nativity and mortality figures would slowly go down towards a given bottom limit, the nativity from 1937 to 1944 increased to double. The migratory movement is very much governed by the business conditions. Former forecasts were founded in essentials on the rationalization of agriculture and the movement of the rural population to built up areas and Stockholm. Some half of the migration to Stockholm, however, comes from other towns. An analysis of population is given in appendix C (5.1).

While it is true the population of Greater Stockholm grew between 1870 and 1945 more than six fold, yet throughout that time it has remained fairly constant as 1/5 of the urban population of the country. During the twenties and thirties the population increase of Greater Stockholm represented practically one half of the whole population increase of the country, but in the first half of the forties the relation fell to nearly 1/3 (5.2).

The age groups tending to migrate will be much less in the fifties, and this should be reflected in less migration to Greater Stockholm. These age groups will increase in the sixties, which should result in an increased trend to moving in. A relative increase of persons of marriageable age should result in higher marriage frequency, high birthrate and low death rate. One may therefore expect in the sixties a new wave of large families.

In the five year period 1942—46, Greater Stockholm increased by 130,000 inhabitants. If expansion may be assumed to continue at the same rate, Greater Stockholm would have 1.26 million in 1960 and 1.52 million inhabitants in 1970. In the thirties Greater Stockholm increased by 125,000 and in the forties by 208,000. If the population does not exceed 1.1 million by 1960 the average annual increment would not have been more than half that of the forties, and if by 1970 it has not exceeded 1.3 million the annual increment would not have been more than the annual mean for the period 1930—50.

The calculations made to judge the probability of various assumptions have considered how large a part of the age groups 15—65 engaged in urban occupations there is in Greater Stockholm. This part has risen slowly and is assumed to be still rising to some extent.

The working hypothesis used as basis for drawing up the general plan has been formulated so that Greater Stockholm is assumed not to have exceeded 1.3 million inhabitants by 1970 (5.3).

Data regarding the number of inhabitants within the boundaries of Stockholm City are not a condition for planning but a result of same. The number of inhabitants depends on the standard on which the remaining residential areas are developed on the one hand and on which rebuilding in the inner city is carried out on the other. It is also dependent on the speed with which the addition of undertakings in the city drives out the inhabitants from the inner city (5.4).

SECTION II. NORMS AND PRINCIPLES

CHAP. 6. OBJECTS

The planning can only in part be based on actual forecasts of conditions. As regards judging the necessary values the planner is only able to a limited extent to obtain guidance from the opinions of inquiries or from the reports of representative bodies. The evaluation by the planners themselves of what is desirable and advisable will therefore in the last event be decisive for the formulation of the objects to be aimed at (6.11).

In general planning we are concerned in the first place with the planning of building and the requisite communications and open spaces. Needs change very rapidly, whereas the layouts planned must serve for one or more generations. The amount of investment in buildings and means of communication bind the future development. The influence of the present on the future will be so much stronger if in our planning we narrowly adapt our solutions to the needs of today or tomorrow. Our vision of the future will therefore always constitute a weighty condition in planning (6.12).

The discussion has often been dominated by questions that refer to technical and economic efficiency. It has been considered that technical developments and human progress covered each other to a large extent. Against this view there is set the demand for the physical well-being of human beings and their surroundings, i. e., their facilities for personal development and social adaptation (6.13).

Criticism such as is general in Western countries concerning large towns is only applicable to a limited extent as regards Stockholm. Owing to its youth in comparison with other large cities, Stockholm has a better socio-psychological milieu than many other towns of equal size (6.21—6.22).

The question of central importance is: Concentration or dispersion? For the private person who is in employment or runs a business, proximity to the centre of the large town appears as a rule to be an advantage, but cost and loss of time represent disadvantages for all. The higher level of incomes compared with smaller towns is counter-balanced by heavier and more numerous expenses. The heavy increase in population is a result of business and industry expanding, and the influx of able-bodied workers without children and other dependents to support (6.31).

Great attention has been given in the general discussion to »neighbourhood planning». This term is given varying meanings. The dwellings are grouped into units suited to the operation of certain municipal activities and for

shopping. The neighbourhood units are then functional units. In some cases efforts are made to adapt the units to a social group formation, observed or anticipated among the population, and then it is social units that are referred to. In yet other cases the units are adapted to »the children's world» and »the adults' world». The psychological questions one is concerned with here have not been investigated thoroughly enough for it to be possible to base planning rules on them (6.32).

Dispersion of places of work to different sections of the city is regarded as desirable for two reasons. For one thing, the life of the city sections as an independent unit is strengthened if part of the inhabitants both live and work there and, for another, it can make the surroundings of dormitory towns more alive. (In addition there are considerable advantages as regards financing communications — see chap. 13.)

In the newly developed areas, should the aim be to mix the different social classes or should areas homogeneous in this respect be developed? It is not possible to furnish an answer to this question that is generally applicable. The question of local autonomy for different parts of the metropolis is being discussed (6.33).

CHAP. 7. THE ARCHITECTURAL ASPECT

Our evaluation of the factors creating a social atmosphere is influenced by our aesthetic ideas. The norms for planning cannot, therefore, be dealt with independently of the associated problems of form.

In this chapter there are discussed the antiquarian interests, the desire for conservation of buildings or beauty spots. Such reserved areas must be restricted as to size (7.1).

Aesthetic motives as regards planning measures are still of less weight than considerations of safety against fire, sanitation or traffic safety. Beauty is still regarded in many quarters as a thing that can be dispensed with (7.2).

The street picture has changed from the corridor streets to the indefinite free surfaces of the thirties and further to a more enclosed space formation, an obvious aim of the forties. This makes the surroundings of the urban dwellers more static. Traffic should be carried outside or beneath the spaces where people pass the greater part of their day (7.3).

The problem of milieu is reflected in the frequently recurring town utopias of garden city and metropolis, of which the former seems to have deep roots with us (7.4).

CHAP. 8. STRUCTURE OF GREATER STOCKHOLM

The changes in Greater Stockholm's structure are primarily dependent on the build up of the communications system. A summary investigation concerning the population that can be served by a system of local lines with four tracks on the busiest sections plus the State Railways and other railways plus bus lines, has shown that the assumption of 1.3 million inhabitants is reasonable (8.1).

With a view to improving communication conditions and contact between dwelling and place of work, the aim should be decentralization of undertakings (8.2). A logical solution of these problems is the building of satellite towns. Within the city borders there are few possibilities for this, but we propose that sections of the city lying farthest out be provided with places of work, so that an appreciable part of the inhabitants may find employment there. The inner suburbs should for the most part continue to be dormitory towns for those whose work is in the centre, as the supply of dwellings in the inner city will continue to be inadequate, even after execution of far-reaching decentralization. Nevertheless, we discuss the conditions for satellite towns and give an account of the establishments built. In proximity to Stockholm new satellite towns may be thought of at Halmsjö Airfield and at a projected new naval station (8.3).

Certain assumptions concerning the possibilities of extending the different means of communication in Greater Stockholm constitute the basis of general plan work and they are consequently dealt with in this chapter (8.4). For the same reason reference is made to certain assumptions regarding recreation areas,

summer housing and summer traffic (8.5—8.6).

CHAP. 9. WORKING AREAS

The norms for building in the central working area distinguish between offices proper, warehouses, factories and workshops, as also shops and similar premises.

For office buildings, lofty construction is the most suitable. Broad streets are required. Floor-space index just over 3 and traffic-space index of 0.25 are considered possible (9.11).

Industrial buildings in the centre are satisfied with less good lighting conditions, demand greater space for loading and unloading, but smaller parking facilities. The possible floor-space index is about 4 and traffic-space index about 0.1. Structures specially designed for warehousing purposes should, it is suggested, be assembled round quays and railway goods stations (9.12—9.13).

Shops do not as a rule require more than two-storey buildings preferably on through going sites with goods reception at the back. They require wide sidewalks, particularly if vehicular traffic is considerable (9.14).

Industrial undertakings — outside the centre of the town — are divided into three categories, according to the degree of disturbance from them. »Non-disturbing industries» it is assumed can be located even in the residential area, whereas »normally disturbing» and »very disturbing» undertakings should be located in industrial areas proper, in the last-named case particularly well isolated from the surrounding dwellings (9.21).

Garbage and sewage water in a Greater Stockholm with 1.3 million inhabitants is estimated as containing 25 % organic matter. Dealing with the waste, therefore, is not merely a question of sanitation, but as much as possible of the organic matters must be returned to the soil (9.22).

Ground should be reserved for adminstration buildings in the vicinity of suburban stations in the outer areas (9.23).

Social care establishments constitute both places of work and dwellings. Small establishments, such as homes for the aged, should be arranged as and located among ordinary dwellings. Larger establishments may usually be located in suburban areas (9.3).

CHAP. 10. HOUSING

Planning of housing is designed to lay down the nature of housing production and the distribution of various types of dwellings and buildings. To make clear the conditions for improvement of the housing standard, there are considered the consequences of an »ideal norm», implying that every person shall have a room of his own and also a norm that was used by Bostadssociala utredningen (the Social Housing Inquiry). In both these cases there is required extensive production of large dwellings and later the demolition or extension of dwellings with one room and kitchen. Against this idea must be put the preferences of the applicants for dwellings, who mostly demand small dwellings.

The practical goal for the fifties is restricted by 1) it being possible only to reckon on slight improvement as regards density, 2) the city will be almost completely built up in ten years, and 3) it can hardly be possible in that period to start any extensive reconstruction of the older housing property.

An investigation by interviews in 1943 gave a picture of the wishes of Stockholm families in regard to dwellings. According to this, about 1/3 of households would like to live in single-family houses. A very small proportion of the households said that they preferred flats in the suburbs, and of those already living in such flats only 1/5 were content with their dwellings, whereas the corresponding proportion for flats in the inner city was almost one half and for villas practically all were content.

The composition of production as regards type of buildings is dependent on the distribution among various kinds of builders. With the existing system for financing building the government has a deciding influence. Variation in the general level of prosperity involves changes in the composition of households, especially as regards the numbers of house-

holds comprising one person only. The number of these is also affected by the supply of suitable dwellings. The relative demand for separate dwellings by unmarried and previously married persons varies considerably from time to time. The proposed distribution among various types of dwellings represents a moderate move towards larger dwellings. Whereas small dwellings can only be provided in multi-family buildings it is possible as an alternative to construct dwellings with 3 rooms and kitchen and upwards as single-family houses. While in the forties about 8 % of the dwellings were built in the form of detached houses and cottages, we are proposing that the production of single-family houses be raised to comprise about 1/4 of the dwellings, corresponding to 1/3 of the room units (10.13).

The consequences in respect of ground requirements and town planning cost from an increased production of single-family houses have been investigated, it being assumed that half of the single-family houses will be provided by detached houses and half built as terraces. As compared with conditions in 1948 the ground requirement per dwelling will increase by 17 %. The ground located between 500 and 900 m from the suburban stations is assumed to have available the requisite areas for housing in single-family houses (10.141).

An inquiry into town planning costs is mainly based on information from the books of the Public Works Department and shows that the general standard of space and the nature of the ground have in reality had a greater influence than the degree of exploitation. Basing on practice and prices in 1948, the town planning costs for blocks of flats is taken at 400—500 kronor per room unit and for cottages 1,600—2,000 kronor. For terraces it has been reckoned at about 700 kronor per room unit. Of course, the town planning costs are dependent on the technical standard (10.142).

The costs of communications are not reckoned in the town planning costs but examples are given to show the importance of utilizing the areas served by the local lines as much as possible (10.143).

Building costs are to be added to the town planning costs and these are estimated for 1948 at for blocks of flats 9,200 and for cottages 7,400 kronor per room unit. Thus the total costs for building and planning for the room unit will be 9,600—9,700 kronor in flats and 9,000—9,400 in cottages. The variations in individual cases are so great that pending investigation of operating costs it is hardly possible to declare that any one of the types of buildings is cheaper (10.144). The possibilities of cultivation of the ground of a dwelling represent a value that must be taken into account in this calculation (10.145).

The change to more single-family houses is not considered in itself to involve any appreciable increase in the building cost per room unit. Nevertheless, according to the projected production plan the town planning costs will, providing price levels do not alter, be 18 % greater. The total cost for building and town planning will rise owing to increase in the average size of dwellings (10.146).

As indication of qualities in the housing, certain town planning norms are employed: floor-space index and open-space index. The norm given for detached cottages is a floor-space index of 0.08—0.15, equivalent to 40—80 inhabitants per hectare (16—32 per acre). For terraced and similar dwellings the corresponding indexes are 0.25—0.35 and 100—140 (40—56 per acre) respectively. For 3-storey narrow flat buildings the net floor-space index is taken as being between 0.5 and 0.6, equivalent to 200—250 inhabitants per hectare (80—100 per acre), while for the multi-storey buildings of the inner city the population density has been taken as about 700 inhabitants per hectare (280 per acre), equivalent to a net floor-space index of 1.54 (10.2).

CHAP. 11. PUBLIC SERVICES

The public services required in a housing area are divided between various commercial undertakings and institutions paid for by local or government authorities or by various associations. Regarding the former we have sought to arrive at the magnitude of the necessary nucleus of customers and regarding the latter

we have aimed at a compromise between the expenditure that can reasonably be borne by the authorities and the desires of the inhabitants (11.1).

A sufficiency of shops is an essential condition for a housing area to be agreeable. Distinction is made between nearby shops and central shops. In collaboration with the Stockholm Shopkeepers' Association minimum requirement for nucleus of customers has been stated for various kinds of shops (11.21).

The majority of housewives prefer to do their washing themselves. The housing areas should be provided with wash-houses equipped with mechanical aids and serving 500—700 households. Over and beyond these one must take into account big laundries serving 30—50,000 inhabitants (11.22).

It seems possible only to operate restaurants in the outer areas in the vicinity of places of employment which provide midday customers. Certain types of simpler refreshment establishments would seem, however, capable of paying their way in housing areas (11.23).

Dwellings for domestic helps should be available in the housing areas (11.24).

Community buildings, i. e., blocks of flats with certain common services in the building, mainly designed for tenants, are still only in the experimental stage, but it is desirable that such buildings be erected in the larger centres (11.25).

Children's centres comprise both day care of children whose mothers are out at work and play schools for preparatory education of children aged 4—6 years. The premises are also used as places where schoolchildren whose parents are both out at work can go in the afternoon. The town planning should reserve space for such a children's centre per 2,000—3,000 inhabitants. The question as to whether only play school or day home as well should be built must be decided for each case (11.31).

Playgrounds should be provided of three kinds: (1) sand boxes in each block (except where each family can have one of its own), (2) smaller grounds with hard surface about 1,200 m² with a few requisites for games, not more than 150 m distant from the dwelllings and, finally, (3) large playgrounds about 2,000 m² with games leader, preferably within 300 m of the dwellings. The two last categories should have a total area in the outer areas of 1.5—2 m²/inhabitant and in the inner town 0.6—0.9 m²/inhabitant. In areas with big population density the playgrounds may either be made larger or be located closer together (11.32).

Owing to the progressive adoption of the new combined elementary and secondary schools, it is not possible to establish any fixed norms for the dimensions of schools at present. The largest schools projected comprise 40 classrooms and walking distances to them do not exceed 600—700 m. There are now about 1,800 class-rooms in elementary schools. By 1960 the city will be requiring 2,600 class-rooms for the equivalent educational stages (11.331).

In a »higher grade school area» with 30,000—40,000 inhabitants there are planned at present one gymnasium + modern school with about 800—1,000 pupils and another higher grade school (11.332).

The adoption of the new school system calls for an increase in the number of class-rooms by about 10 % and an equivalent amount of floor-space is required in addition for other purposes (11.333).

It is not possible to establish any real norms for spare-time premises. »The demand» adapts itself to the supply. It is essential that suitable leaders should be at hand. Premises alone are not sufficient to set spare-time activities going (11.4).

Only a small portion of the adult population participates in spare-time activities at present. Nevertheless the provision of spare-time accommodation — community centres — is justified (11.41).

The adolescent youth spends the greater part of its time, on the other hand, outside the home. Premises for its requirements should be suited both for societies and for unorganized activity. Various arrangements are possible, such as separate youth accommodation or such accommodation in conjunction with community house (11.42).

Libraries, to be adequately supplied, should

contain 30,000 volumes, which will serve 30,000 inhabitants. To ensure reasonable walking distance, however, one library for every 15,000 inhabitants is planned in the outer areas (11.43).

Sports accommodation consists in the first place of outdoor grounds of various kinds. There should be a football ground at each school. Not more than 600 m from each dwelling there should be a large field for ball games, and each complete playground should have a smaller such field. An athletic ground (with two fields) has an influence area with 1,500 m radius. Buildings for indoor athletics of various kinds are planned either separate or in conjunction with school buildings in the outer areas (11.44).

It is important that the outer areas should have access to picture houses, one per 20,000 —25,000 inhabitants (11.441).

There should be various kinds of assembly places, both for public events, usually arranged by the city parks department and for the summer festivals of societies (11.442).

Division of the large state church parishes in the outer areas of the city is the subject of discussion. In general it is desired to assemble all premises necessary for parish work in a single building, which should be located in a large centre (11.45).

Basing on the various public services the following functional units in the outer areas may be considered: housing groups with 500—700 inhabitants, neighbourhood groups with 1,000—3,000, residential areas with 7,000 —15,000 and town districts with 25,000— 50,000 inhabitants (11.5).

CHAP. 12. PUBLIC INSTITUTIONS

According to a plan drawn up by the hospital authorities for out-patient treatment, five health centres furnished with policlinics, specialist consultation and laboratories, located near large traffic junctions, are projected. The future organisation of district health officers is at present the subject of enquiry. Centres for at least 10,000 inhabitants should comprise a pharmacy. The maternity centres are located as a rule at hospitals. In each housing area (7,000—15,000 inhabitants) there should be a child welfare centre. Public dental clinics are arranged at the elementary schools. One sick fund is estimated to serve 30,000 inhabitants. Social welfare requires central premises in each city section (25,000—50,000 inhabitants) (12.1).

In-patient treatment is estimated to require 6.0—6.2 actual hospital beds per 1,000 inhabitants. In the spring of 1950 there were 4,201 beds, whereas requirements were estimated as 4,540. By 1960 it would rise to 4,917. In addition, the above-mentioned plan provides for beds for infectious diseases numbering about 1,300. No new beds for tuberculosis treatment are required in the city boundaries. The number of beds for mental treatment is estimated for 1957 as 4,300 (12.2).

Education and care of the feeble-minded need institutions and day-schools. The former will be located outside the city limit and thus call for no measure in the general plan. The latter require small buildings in different parts of the city (12.3).

Treatment of chronic cases is at present divided between the hospital authorities and the Poor Relief Board. The former estimates its requirements in 1950 as 1,800 beds, rising to 2,300 beds in 1960. The Poor Relief Board's requirements are estimated for 1950 as 1,500 beds and for 1960 as 2,200 (12.4).

In the city's homes for the aged there are only places of acceptable standard for 380. By 1960 the requirements are estimated to have risen to about 1,800 places. Old people's homes should preferably be located in small units situated among the ordinary blocks of flats. From 1950 a special government subsidy can be given for »pensioners' flats» in ordinary buildings owned municipally or by a non-profit enterprise. At the end of 1952 there will be 1,630 such flats in the city of Stockholm, but 3,000 more have applied for them. With regard to this and to the increase of the aged nearly 300 such flats should be built per annum during most of the 50's (12.5).

Stockholm University should be extended in the blocks around Observatorielunden. The special colleges on the other hand must be

given more peripheral locations, on North Djurgården and possibly in some satellite town (12.6).

CHAP. 13. PASSENGER AND GOODS TRAFFIC

Unfortunately it was not possible to secure as basis for the general plan as much traffic census material for the period after 1945 as was desirable (13.1).

Thorough counts of the amount of traffic have been carried out at the main approaches from the suburban areas. Between 1938 and 1944 the number of journeys per inhabitant and year culminated or stagnated. In the future the number of journeys is assumed to be 500—550 journeys per inhabitant and year, with a distribution of 55 % = 300 journeys by public services, 40 % = 220 journeys by private cars and 5 % = 30 journeys by cycle (13.11).

The relative number of motor vehicles is expected to grow from the present 53.1 vehicles per 1,000 inhabitants to 100 vehicles. Private cars now constitute 73 % and are assumed to increase to 80 % of the number (13.12).

In computing the future volume of traffic — expressed in motor vehicles in radial direction per 1,000 inhabitants in the suburban area — distinction must be made between the traffic which has a tendency to arise and that which can reasonably be dealt with. In the radial traffic it is assumed that private cars will be utilized as much and motor trucks rather less than before the war. This gives 550 vehicles passing per day and per 1,000 inhabitants of the suburbs. Nevertheless, it is assumed that only 80 % of this peak traffic can be dealt with, which is equivalent to a reduction of the daily traffic by 15 % (13.13).

The maximum traffic by motor car on Saturdays in summer is assumed as 1.6 times the mean hourly traffic or 1/8 of the daily figures obtained in the customary October census. Cycle traffic has very pronounced peaks. On central traffic arteries, we reckon that the volume of cycle traffic will in the future be 30—50 % of that of motor traffic. The traffic on the surburban and city underground lines has been calculated by the tramway company to the extent that the accommodation available in peak quarter-hours should represent 5 % of the number of inhabitants in the area served. A double track through the inner city can serve 200,000 inhabitants at each end (13.14).

To and from Nedre Norrmalm (Lower Norrmalm) the through traffic is estimated at 195,000 (42 %) and local traffic at 275,000 (58 %), or altogether 470,000 vehicles per day. By-pass routes should be constructed, so that the local street system can be relieved as much as possible of through traffic (13.15).

The estimated amount of traffic in the main business centre is 40 % larger than that stated in the 1946 plan for Lower Norrmalm. It is an illusion to suppose that the traffic volumes obtained by the forecasts could in reality be dealt with. The problem is to construct a system of streets of even capacity, where there is a proper relation between the capacities at the various points (13.161).

Traffic on the approach roads to the inner city from the west is estimated to be 70 % greater and from the south 50 % greater than the normal capacity of the projected arteries. To deal with the whole of the estimated traffic there would be required in the west an additional bridge for 6 lines of traffic and in the south one for 6 lines and one for 4 lines. It would thus seem that the principle of street system of uniform capacity should even be extended to the approach roads to the inner city (13.162).

The street system should — even in the inner city — be differentiated as arterial streets (A-streets), feeding streets (B-streets) and local streets (C-streets) (13.221). For A- and B-streets, standard sections are stated as also certain other principles for their arrangement (13.222). The clearance height should normally be 4.5 m, though possibly it may be lowered to 3.5 m where alternative route is available. For cycles there is required 2.3 m (13.223). Certain qualities and principles for the layout of various kinds of traffic places are stated (13.224). Figures for capacity, both normal and exceptional, to be attained over short sections and for brief periods, are

stated for lines of vehicles, circulation points and street crossings (13.225).

On the basis of available information we have tried to arrive at an approximate comparison between the costs of suburban traffic with various means of communication (13.31). The cost for the State Railways' present local traffic has been taken as between 4 and 5 öre per passenger kilometre. The difference between costs for rush hour traffic and other traffic is not known (13.311). For suburban and underground lines the cost is estimated to average 6 öre per passenger kilometre, in rush hours 10 öre and with low traffic 5 öre (13.312). Corresponding costs for bus traffic are estimated at 10, 16 and 8 öre respectively per passenger kilometre (13.313). From these figures we draw the conclusion that the greatest possible part of the housing should be located in areas reached by services running on rails (13.32).

Considerable decreases in transport service expenditure can be achieved by locating the places of work in the outer residential areas. The capitalized value of the saving of one worker's travel fram the suburban area to the place of work in the inner city is estimated at 27,500 kronor, if he travels by bus and 15,500 kronor, if he uses tram or railway. If only the city's decreased operating losses are capitalised the corresponding figures will be 21,000 and 9,000 kronor (13.33).

It is for the city and the property owners to provide the requisite parking places (13.4). Assuming that the road users will in the future have the same parking habits as in 1939, the traffic which will tend to arise in the future would require 16,000 parking places in Lower Norrmalm, 5,700 for parking for periods shorter than 2 hours and 9,700 for parking of longer duration. The number of parking places on the streets in that area may be estimated at about 1,500. The balance required must be furnished as off-street parking — partially in parking buildings — or outside the »City» area. If the regulation were imposed that one parking place per 200 m² floorspace must be arranged in new office buildings, there would be obtained in private buildings about 5,500 parking places. On the streets and in public parking establishments there would be 4,500, making a total for Lower Norrmalm of 10,000 places (13.411). Garage with parking facilities should be arranged in the building where requirements exceed more than 100 places. In other cases several buildings can join in one parking establishment. Units smaller than 50 places should not exist (13.412). In the central parts of the city separate places for loading and unloading should be arranged off the streets (13.413). To ensure full utilization of the big investments in buildings in the centre they must have access to necessary parking places (13.414).

To provide for future parking or garaging of cars at night in the residential areas, ground is reserved in the town plans for separate parking etablishments (13.42).

The parking places necessary for industrial undertakings should be arranged on the premises (13.43).

Storage rooms for cycles are now arranged in residential blocks, providing two places for each three occupants (13.44).

Long-distance traffic on the railways must be assumed to increase by about 100 % (13.51). Suburban traffic on the railway lines has been estimated by the State Railways to increase 2—2½ times (13.52). Transfer traffic between State Railways and underground lines is different in character for long-distance passengers and for local passengers (13.53).

Long-distance travel by motorcar is estimated to increase to 4—5 times the level of 1936. Nevertheless, it will represent but a small part of the total traffic in the critical sections (13.6).

Bromma and Halmsjö airports will suffice for the regular air services to Stockholm for some time to come. The greater part of the traffic covers such short distances that it is desirable to raise the capacity at Bromma (13.7).

Consideration of the problem of goods traffic could not unfortunately be based on figures for the post-war period. The goods traffic figures for May 1948, when a special census was made, were not available early enough to be utilized (13.8). Goods traffic by the rail-

ways presents no great problem (13.81). Goods stations for motor transport should be located in proximity to major highways and railways (13.82).

The dimensions of Stockholm port facilities are designed for handling the mass of imported goods required for the hinterland. The main part of the population is concentrated in Greater Stockholm (13.831). We have made assumptions concerning the future import per inhabitant, separately for the thirteen most important groups of merchandise (13.832). The quays are divided into three main groups according to depth of water (A, B and C quays). The distribution of imports over the different types of quays and their unloading capacity have been investigated (13.833). A like distribution and conversion of the future quantities of merchandise would with 1.1 million inhabitants in Greater Stockholm require about 7,700 m new quays and with 1.3 million a further 4,000 m (13.834).

Coal, coke and oil provide (1947) for about 95 % of the energy consumed in the city (13.91).

By the end of the fifties the available hydraulic power stations will not be sufficient for the city's electricity requirements, so that thermal power stations will have to be employed. Atomic power stations are not expected to have any quantitative importance in the period the general plan seeks to survey (13.92).

SECTION III. THE PLAN

CHAP. 14. CHARACTER OF THE GENERAL PLAN

The actual general plan maps, 19 sheets in scale 1 : 10,000, could not be reproduced in this book. The plans printed here are abridgments and simplifications of same. Chapter 14 is in itself a summary of the most important viewpoints in the chapters 15—21 which follow.

With full development, the city of Stockholm will by the beginning of the sixties be capable of accommodating in its present boundaries about 900,000 inhabitants, rather under 400,000 in the inner city and rather over 500,000 in the outer areas. In the inner area there will be living about 190,000 persons employed in trades and professions with fixed places of work, in the outer areas about 210,000. The distribution of places of work will for a long time be such that there is an excess in the inner city. Even with the most favourable distribution imaginable, which will certainly not be possible of attainment for 20 or 30 years, it must be assumed that at least 1/4 of suburban dwellers engaged in trades and professions will have their places of work in the inner city (14.1).

The working areas will be extended very considerably in the inner city, while at the same time the internal differentiation will continue. The business section will expand chiefly towards the north, the central government administration on the west side of the Old Town, and the municipal administration on Kungsholmen. It is assumed that certain institutions for scientific purposes and for sick care and social welfare will move out from the inner city. It is desirable to retain a large number of dwellings in the inner city. The residential areas, however, must be regarded as being so reconstructed that they satisfy reasonable demands for light and open space. The small incidence of children for one thing makes it possible to build with high density of population. The inner city will be encircled and traversed by arterial roads, chiefly designed for motor traffic (14.2).

It is not possible to avoid having certain sectors of the suburban areas with a surplus of working places while others will have a shortage. The residential areas nearest the inner city will be required to a large extent for those employed in the centre, whereas in the remoter residential areas the aim should be to make them selfsupporting with various kinds of places of employment. The general plan comprises a total of about 600 new factory areas. Of these, 200 are estimated for existing undertakings moving out from the inner city and the remainder for expansions or new undertakings. There is without doubt a great need for single-family houses. For various reasons, however, this part of production must be limited. From and including

the summer of 1948 building will comprise 270,000 room units, of which 60,000 (22 %) are intended to be provided in single-family houses (14.3).

Radial traffic communications are so expensive to construct and operate, that one must count on utilizing them for other kinds of journeys than those to and from work. In projecting new sections of the suburban lines the distance between stations has been increased. The stations will thus serve appreciably larger populations than those planned earlier. A total of 280,000 inhabitants will be directly served by the local lines, while 50,000 will have to travel by bus services connecting with them. 75,000 will be served by bus lines direct to the inner city, and 40,000 will live along the railway lines and bus services connecting with them. The difficulty in providing terminal stations for the suburban lines in the inner city will increase. Consequently one must try to arrange for transfer to means of communication running on tracks to be outside the inner city wherever possible. Certain of the bus stations in the city must be accommodated off the streets. The means of communication in the inner city are constantly undergoing change (14.4).

The outer areas are poorly provided with public institutions. The plan includes the necessary grounds reserved to enable this shortage to be remedied (14.5).

CHAP. 15. WORKING AREAS

Government administration is considered as being concentrated to the west side of the Old Town and Riddarholmen and the municipal administration to the eastern part of Kungsholmen. The government administration has other areas for extension on outer Kungsholmen and Gärdet. Certain administrative bodies can with advantage be located at large centres, such as Vällingby, Högdalen and Farsta (15.1).

The business section proper is assumed as expanding mainly to the north and north-east. Certain blocks in the neighbourhood of underground stations will be taken over to an increased extent by business undertakings. In addition there will, of course, occur mixture of business undertaking and dwellings. Shops and other service undertakings expand in the various sections of the city in proportion to the population (15.2).

Undertakings which carry on wholesale trade in perishable foodstuffs in the Old Town should be moved to provide space for administrative buildings. The area at Klarahallen will soon be too small for the wholesale trade in garden produce and fish. The abattoirs should therefore be extended to comprise wholesale trade facilities for all kinds of foodstuffs and flowers (15.3).

Certain branches of industry should naturally be situated in the central working area. Undertakings which have no direct contact with harbour business could be moved from the large factory areas close to the harbours to allow space for wholesale business, now located in the centre. The same applies to a certain extent to the areas near the Norra (North) and Södra (South) Stations. Besides the large factory areas with connection to the railways, there are smaller areas in the suburbs so distributed that some part of the inhabitants in the nearby residential areas may find work near their dwellings. The areas served by the Skanstull lines and the Hässelby line will have a considerable shortage of places of work, whereas the areas served by the Västerås line and the Hornstull lines will have a surplus. Altogether there are shown outside the inner city 950 hectares (2,375 acres) of factory sites, of which about 360 hectares (900 acres) were developed in 1947, whereas 590 hectares (1,475 acres) were vacant (15.4).

Areas are shown in Spånga and Hässelby for market gardens. It is desirable to retain a certain amount of cultivation, mainly of vegetables, near the city (15.5).

Special consideration must be given in the district around Odenplan to the need of expansion facilities for Stockholm University. On Norra (North) Djurgården certain areas around Norrtäljevägen and Lidingövägen are assumed to be reserved for colleges and other scientific institutions. The areas are too small, however, so that some will have to move still further out. New areas for such purposes are

considered north of Diplomatstaden and on Galärvarvet (15.6).

CHAP. 16. THE PORT

It would be an advantage if all new harbour works could be constructed on the Baltic side and be accessible to all kinds of ships. All quays for trans-ocean shipping (A-quays) and 44 % of the quays for European shipping (B-quays) will be on the Baltic. Certain establishments projected in Lake Mälar are not very convenient from general planning points of view and it is desirable that other arrangements should be made. The plan for future extension of the harbour works will be revised when the harbour inquiry now proceeding is completed (16.1).

The statement on necessary new harbour works contains detailed particulars of the various types of quays (16.2).

CHAP. 17. COMMUNISATIONS

The actual railway system in the boundaries of Stockholm City is dominated by the State Railways (17.1). The railway facilities for passenger traffic are studied by the 1949 Traffic Commission of Greater Stockholm. The junction line is assumed to be the only north—south rail connection through the city, and the Central Station is assumed to remain on the whole on its present site (17.11). There has long been projected a marshalling yard for goods traffic on Årstafältet (17.12).

The City Council decided in 1941 to construct an underground line through the city, which along with the suburban lines would constitute a local line serving the whole area of the city. In 1945 it was decided that the section Slussen—Sveaplatsen could be made with 4 tracks. The general plan proposes reservation of space so that certain lines may be prolonged to areas outside the city boundaries. In addition there is included an old project for a branch line from Odenplan out to Solna and Sundbyberg. The second pair of tracks on the central section will not be utilized to more than half capacity. It may therefore be found advisable at some future date to link up the Saltsjöbanan (running to Saltsjöbaden) and continue it to the north-east, so that the Lidingö lines and possibly local trains on the Roslag line may be carried on the underground lines (17.2).

After the opening of the western section of the underground line some of the trams on services 16 and 17 may be diverted over Västerbron (West Bridge) to Tegelbacken (17.31).

Of the inhabitants of the suburban areas of the city 1/4, or 134,000, will be carried by bus services. 55,000 of these are taken as transferring to local lines out in the suburban areas, while the balance will travel right into the inner city. The number of these direct bus services can later be decreased. In addition there will be periphery or outer ring bus services linking up the different suburbs (17.32).

The Traffic Commission of Greater Stockholm is considering the possibilities of linking bus services belonging to other transport undertakings to the city's local lines (17.33).

Analysis of the future network of bus services has shown, among other things, the necessity for a new terminal in the northern part of the business section (17.34).

Most of the highways in the outer areas were included in earlier plans, but it is proposed that the lay-outs of several of these be modified and their capacity increased. The possibility of crossings at different levels is given more consideration than previously (17.41).

The communication routes included for the inner city constitute a revision of the system of routes dealt with in the 1946 plan for Lower Norrmalm (17.42).

All the radial highways are considered as connected to a ring road which encircles the city proper. The various sections, however, have little relation to each other and very different traffic loads. Certain parts are extremely expensive to lay, chiefly Österleden (East route) (17.421). The most important north-south artery inside the ring road is Södergatan—Söderbron—Klarastrand (17.422). This is linked with the street bridge over the Årsta islands through the Årsta route (17.423). Connection between Slussen and the Danvikstull bridges remains at Folkungagatan—Renstier-

nasgatan—Katarinavägen (17.424). The Tegnérgatan route is intended to be an east-west connection through the northern sections of the city (17.425). A tunnel line connection between Nybroplan and Tegelbacken would join Strandvägen and Norr Mälarstrand (17.426). In order that the Herkulesgatan—Sveavägen tunnel may be capable of functioning as a through route the number of crossings on Sveavägen should be decreased (17.427). Lidingövägen—Sturegatan should be relieved by a main road either in Sibyllegatan or in Skeppargatan — continuing into the Blasieholm route (17.428). Several important main routes will be dependent on the lay-out of Nybroplan (17.429).

The general plan contains a preliminary proposal for parking installations in the inner city (17.5).

The inner city's system of tram and bus services is an indivisible unit, which must be constantly adapted to changing conditions. The trams, however, impose such demands on the street network that efforts must be made to decide which sections should be given dimensions to take them and which routes through the main traffic intersections should be kept open for them (17.6).

Bromma, Barkarby and Skarpnäck airfields are included in the general plan. In addition there is proposed a base for helicopter planes on Årstafältet. Lindarängen seaplane station is assumed to be shut down (17.7).

CHAP. 18. RESIDENTIAL AREAS

For various reasons it is very desirable to retain a large number of dwellings in the inner city.

Efforts are made in the general plan provisionally to set forth the conditions for reconstructing the older residential areas in the inner city. The conditions are very different in areas where the new buildings are intended to contain places of work and where they are to be purely residential buildings. In most of those areas the buildings have been built in several different periods, so that renewal must be gradual. The residential areas in the inner city can conveniently be divided off in relation to the division into parishes. In 1947 about 390,000 inhabitants were living in »permanent» residential areas, but the number will decrease owing to improvement of the standard of dwellings and to reconstruction. After clearing it is estimated the reconstructed areas will accommodate about 700 inhabitants per hectare (280 per acre) and that they will take about 260,000 inhabitants altogether. In those parts which do not require improvement the number of inhabitants in 1947 was about 93,000. The population density there is reckoned as falling from 600 to 520 inhabitants per hectare (240 to 210 per acre), thus bringing the population down by about 81,000. On undeveloped areas there is space for 24,000 inhabitants. There would be living in the residential area in the inner city after completion of the improvements about 360,000. Then there is a certain population in the working areas and altogether there would be about 370,000 inhabitants. In 1943 about 465,000 were living in those areas. Fresh arrivals amount to 24,000 and the actual decrease will therefore be about 120,000 inhabitants. Ten percent of these come from areas not to be reconstructed, 33 % (39,000) from residential areas to be reconstructed and 57 % from the area recommended as working area (18.1).

As regards existing residential areas in the suburbs only small additions are recommended and, where this is possible, sites reserved for necessary public buildings and the like. Everything on leasehold ground is shown for its present purpose (18.21).

The new housing units shown correspond to what are called in chapter 11 »residential areas». Only areas for community services requiring considerable space have been included. Other such establishments and centres have been merely indicated by symbols. The population has been stated on the assumption of one occupant per room unit of 22 m² floor space, which should correspond to conditions in the near future. Including the building quota for 1950 the outer areas are estimated to have space for a new production that can accommodate 240,000 inhabitants. The total volume of building in the outer areas may be said to be equivalent to a population of

540,000, but on account of the continuing evacuation from the older dwellings the maximum population has been estimated at about 510,000, comprising 350,000 in the south and 160,000 in the west. Of the additions from and including the summer of 1948 it is reckoned 22 % of the room units are in single-family houses. In the southern suburban area the figure is 18 %, and in the west it is 30 % owing to there being large semi-developed areas with such buildings (18.22).

The larger units — city sections — are considered as having as a rule large centres where higher grade schools and similar community arrangements are located (18.23).

CHAP. 19. GREEN SPACES

The most important open spaces for the inner city are parts of South and North Djurgården and Haga Park. Södermalm and North Enskede have the Nacka Reserve, South Enskede has Farsta Woods and Ågesta. Brännkyrka will have an open space along the shores of Lake Mälar from Mälarhöjden westwards, connected with in the open space at Vårby. In the west there are Judarn and Grimsta Reserves and parts of Lövsta which should be included in a large open space along the shore of Lake Mälar. The open spaces should be linked up by park strips (19.1).

In various parts of the city there are planned sports grounds, i. e. large spaces intended for athletic meetings requiring considerable room and for events with large attendance. The area along Lidingövägen is reserved for the north-east sections, where there would be space for large crowds. The southern suburbs would have sports grounds on Årstafältet and the western suburbs would have them in Grimsta Reserve (19.21).

The stated norm of 3 m² athletic area per inhabitant cannot be provided in the inner city. In the outer areas small athletic accommodation is recommended at most of the schools and large accommodation at five places in the south and four in the west (19.22).

The City Council adopted in 1947 a plan submitted for bathing establishments in the southern suburbs. In the west there are proposed two swimming pools in addition to bathing beaches. For the inner city such pools are recommended in the vicinity of Västerbron (West Bridge), on Riddarholmen and at Lidingövägen (19.23).

New ski jumps are recommended at three places (19.24).

Rifle ranges can hardly be laid out close to built up areas. Besides Järvafältet it is proposed that only two ranges should be retained in the city's boundaries. Pistol shooting-ranges can more easily be arranged in the large open-air reserves (19.25).

Access to spaces suitable for laying up small boats is extremely scarce. New places are recommended in the Kaknäs area and on Långholmen (19.26).

Large athletic halls are planned at three places in the inner city and at five secondary schools in the outer areas (19.27).

The positions of festival places for public and private »fêtes» are shown schematically. New and larger establishments of this kind are recommended on Långholmen, at Lilla Sickla and by Lillsjön (19.3).

In future there will be three kinds of allotment gardens: (1) cultivated plots, included in the park areas, (2) nearby allotments of traditional type within the boundaries of the city and (3) distant allotments on city ground in other municipalities. Only nearby allotments are given in the plan. Many existing allotments must be progressively closed (19.4).

Skogskyrkogården (Woodland Cemetery) can be considerably enlarged. For the north and west sections of the city there is recommended a new burial ground at Råcksta (19.5).

CHAP. 20. BUILDINGS FOR SICK CARE AND SOCIAL WELFARE

Three central infirmaries are recommended by the Town planning office in the inner city, Södersjukhus, Sabbatsberg and S:t Göran, while it is proposed to shut down S:t Erik's hospital. The plan provides ground reserved for four proposed regional hospitals, one on Kampementsbacken, one at Hökarängen, one at Fruängen and one at Råcksta.

No new hospital beds are required for tuberculosis treatment and a new mental hospital is proposed outside the boundaries of the city (20.1).

New places for treatment of chronic cases are to be obtained at older hospitals reconstructed for the purpose, at the new regional hospitals and in separate treatment homes. Sites for four such establishments are provided in the plan (20.2).

The need for new homes for the aged is to be covered both in parts of the new treatment homes and in small establishments in the various sections of the city and conforming to the flat buildings there (20.3).

CHAP. 21. PUBLIC UTILITIES

The two waterworks of the city on Lake Mälar, Lovöverket and Norsborgsverket, should be able after extension to supply Stockholm, Nacka, the greater part of Lidingö and a small part of Solna. The two waterworks require new conduits into the city and three new large reservoirs (21.1).

The greater part of the city's built up areas is connected to one of the six existing sewage plants. South Enskede is connected to Henriksdal. Space is reserved in Brännkyrka for a new large sewage plant. South Spånga is connected to the existing plant at Åkeshov (21.2).

The general plan does not deal with questions relating to gas supply (21.3).

Ground has been reserved in the plan for the large plants comprised in the city's system of electricity supply (21.4).

Thermal plants and central heating plants should be situated so that fuel can be delivered direct by water. No definite location is indicated (21.5).

The necessary ground for plants etc. for the Sanitary Department is reserved in industrial and traffic areas (21.6).

Local radio telephony is employed by a growing number of institutions in the city. Possible locations for transmitters have been investigated (21.7).

Four of the existing eight fire stations are expected to be replaced by three new establishments for which ground is reserved in the plan. In addition it is proposed that South Enskede should have a fire station at Hökarängen (21.8).

SECTION IV.

CHAP. 22. INVESTMENT PLAN FOR 1950-59

The investment estimates, drawn up between November 1949 and April 1950[1], on instructions of the Investment Committee of the City Council, cover the whole ten year period starting with 1950 and are based on the assumption that housing development in the city's boundaries will in the main be concluded during that period with an average production of 8,000 dwellings per annum. The city's population has been assumed to rise from 725,000 inhabitants at the beginning of 1949 to around 875,000 at the close of the ten year period.

The investment plan covers in principle all items which fall under capital expenditure in the budget of the city. The plan covers all municipal works with investment requirements of any considerable size as also the Tramway Company, but not housing companies, the expenditure of which does not fall on the city's budget.

The calculations are based on present standards and extent of municipal activities. The price levels of 1949 constitute the basis for the calculations and the value of money is assumed to remain unchanged during the period. Up to 1955 the investments are given per year, for the remainder of the ten years in one total amount.

According to the plan, the new investments of the city itself 1950—1960 will amount to 1,807 million kronor (mkr), of which 20 mkr will be covered by taxation revenue, 73 mkr by state grants and 1,714 mkr will be obtained from loans. To this must be added 190 mkr borrowed funds reserved for works

[1] *This chapter shows the state of the investigation in Spring 1950. A revision of the investment plan, taking still further factors into account, is now in course of preparation with the committee.*

decided earlier but not begun and 300 mkr for investment requirements of the Tramways Company. Thus, expenditure to be covered by loans amounts altogether to 2,204 mkr, the distribution over departments and boards being as shown in tab. 22 A (22.1).

The investment amount comprises in round figures 480 mkr for Estates Department, 350 mkr for Building Department, 560 mkr for Industries Department, 60 mkr for Social Welfare Department, 220 mkr for Cultural Matters Department and 230 mkr for Health Department, besides 300 mkr for the Tramway Company.

Under Estates Department there is estimated 170 mkr for costs of development of new housing property. For acquisition of property in conjunction with the regulation of Norrmalm, housing sites and open spaces etc. 135 mkr is estimated. New factory areas, buildings for workshops and small industries, car parking accommodation and the like take up 70 mkr and wash-house establishments 7 mkr. 40 mkr is estimated for administrative buildings and 10 mkr for a municipal theatre (22.11).

As regards the Police Department, there are noted buildings for the criminal investigation department and the public prosecutor officials, a policlinic for alcoholists, mentally deficient etc. and new police stations on Norrmalm and Östermalm, at Liljeholmen and in Bromma (22.112).

The main items of investment for the Highways Department deal with streets, bridges, traffic junctions and drainage. Continuation of work on tunnels in the inner city is estimated to take 75 mkr and extension of public transport in the outer areas 30 mkr. There is also considerable expenditure for Södergatan, the Liljeholm, Danvik and Essinge bridges, the regulation of Hornsplan, the Klaraberg viaduct and other traffic junctions and arteries. Drainage and sewage reclamation work is included for 33 mkr. For large parks such as Humlegården and Kungsträdgården and on Långholmen, Gärdet and Kaknäs 14 mkr is estimated. Extensions to and modernisation of street cleaning and scavenging are likewise put at 14 mkr and new fire stations at Bromma and Enskede and on Södermalm are included for 6 mkr.

Funds for the Cemeteries Board are estimated mainly for the provision of a new crematorium, to be located at Spånga (22.122).

The plan of the Committee for Games and Open-air life includes new athletic grounds and grounds for ball games, an artificial ice rink at Johanneshov, athletic halls with swimming baths, the Danelii swimming pool in Eriksdalslunden and another swimming pool, holiday resorts and other open-air establishments, cycle paths and canoe channels, besides new smallboat harbours and laying-up places for boats (22.123).

The very large provision for investment in public utility plants signifies reinforcement of the capacities in line with the city's growth, besides considerable modernisation and renewal in the production apparatus. Earlier plans for extensions to the port have been limited in connection with inquiries carried out in the Port Authority of the city (22.13).

As regards social welfare, the investment plan provides for augmentation and extension of the Poor Relief Board's homes for old people and others and of care of the mentally deficient. The plan also comprises new children's homes and cottage homes. For the most part, however, it is considered that premises required for the welfare of children and young people can be provided in the buildings of the city or the housing companies and are therefore not included in the plan. This is also the case to some extent as regards assembly halls and accommodation for young people, which come under the Committee for Young People (22.14).

The programme for school buildings includes about 40 new elementary schools and half as many secondary schools and trade schools. The prospects of being able to carry through such extensive building are of course uncertain. The need is great, however, as in the ten year period under review Stockholm will be having an unexampled increase in the numbers of children attaining school age (22.15).

Building plans for hospital work are

of the same order of magnitude. Here may be noted extensive reorganisation of Sabbatsberg, S:t Erik's and S:t Göran's Hospitals, regional hospital in Brännkyrka, new policlinics at Alvik and other places, rebuilding of Söderby Hospital and the Hospital for Infectious Diseases, besides increase in care of the chronically diseased and the mentally deficient.

Finally, the investment plan states the Tramway Company's capital requirements for 1950—60 as 300 mkr, of which some 70 mkr is for trams and trolley bus lines, 50 mkr for depots and workshops etc. and 180 mkr for rolling stock (22.17).

The basis for population developments may be disputed. According to a new demographic forecast of the Statistical Office the increment will probably proceed at a lower rate than assumed in the general plan. For one thing, a continued thinning out of density of inhabitants is to be reckoned with, which can mean in the long run that the population in Stockholm will begin to decrease and maybe become stabilised at approximately the present number of inhabitants, i. e. around 750,000 persons (22.2).

Inquiry has also been made into the effects on the city's finances of such considerable borrowing as the carrying through of the investment programme would involve. The annual cost for amortisation and interest on the total loan debt, basing on a 3 % rate of interest, is calculated as rising by something like 40 mkr up to 1954 and almost 75 mkr by 1959 (22.3).

To some extent the increased costs for loans is counterbalanced by income from investments yielding a return. Such income has hitherto in the main covered the chief part of the annual cost for interest and amortisation. In this respect a deterioration will take place. The non-yielding investments during the previous 20 years were less than 40 % of grants from borrowed funds but the proportion is estimated to amount to almost 50 % in the latter part of the present decade. The annual net increase for interest and amortisation service will, however, it is estimated amount to 25 mkr in 1954 and almost 40 mkr in 1959 (22.4).

The main items of the capital budget arrived at on the basis of detailed calculations show an annual capital increase averaging 12 mkr. Converting investments since 1930 to the building cost levels of 1949 we get the investments per inhabitant and year as 137 kronor during the 1930's and 152 kronor during the 1940's, but 231 kronor according to the plan for the 1950's (22.5).

The considerable increases in the cost of the loans themselves would seem, however, to be less than the rise in operating costs. Investigations have therefore been made concerning the development of the city's operating budget and taxation resources during the 1950's. In the nature of things, such calculations cannot but be very uncertain. According to trial budgets drawn up, which obviously can only have the character of working hypotheses, the total taxation requirements, with unchanged levels for wages and prices, would rise from 250 mkr in 1950 to 330 mkr in 1954 and 380 mkr in 1959 (22.6).

With regard to taxation resources, the Statistical Office has drawn up a more optimistic and a less optimistic estimate. The expenditure stated and the mean of the Statistical Office's estimates amount to a rate of taxation of 9 kronor for 1952, 8: 60 kronor for 1953—54 and 9 kronor for 1959. To these figures must be added provision not included for the cost of wage increases for municipal workers and staffs. In view of the very considerable amounts that such provision will represent, the figures presented — the purely hypothetical nature of which need not be stressed — confirm the urgent importance of very careful supervision of the city's finances (22.7).

CHAP. 23. TIME PLAN

The speed for the execution of the extensions is governed by the city's technical and financial resources, by Government regulations concerning investments and by the extent of needs. Then certain minimum periods are required for planning and building (23.1).

The period elapsing from the start of work on the town planning to the decision of the

City Council is about 13 months and to the decision of the Government about 17 months. The time required for construction of streets, laying of mains and erection of buildings in a large residential area is 30 months (23.11).

The calculations of the Investment Committee cover the city's own investments up to and including 1959. It is important, however, to try to estimate the magnitude of work included in the general plan, irrespective of whether it is calculated as being necessary before or after 1960, and even if it is assumed that the work will partly be paid for by others than the city. If the investments of the city before 1960 amount to 2,130 mkr, there is a further 950 mkr which the city will require to invest in the following ten years. As a result of developments in neighbouring towns and urban districts, work amounting to 250 mkr is required within the city boundaries. Nearly 1/3 of the investments in the fifties will go to the communications system, 1/4 to the utility plants and 1/5 to real estate development (23.1).

In the course of 1945—49, period plans were drawn up for housing development in the succeeding five years. Of the factors which determine the order in which the residential areas can be built, it is the possibility of providing communications that is predominant. The normal quota for housing construction was previously taken as 8,000 dwellings, but since 1949 the quota has been between 6,000 and 7,000 dwellings per annum (23.2).

The extension of the underground and suburban lines comprises certain stages, which apart from possible extension of bus services, determine the rate of development of the new residential areas. Terminal stations and other facilities in the inner city determine the capacity and how far out the different lines can be built in the suburban areas.

Stage 1: Lines 18 and 19 with terminus at Slussen.

Stage 2: Line 11 with terminus at Konserthuset.

» 3: Lines 16 and 17 separated in the inner city and carried along Hornsgatan and over Västerbron.

» 4: Lines 18 and 19 prolonged from Slussen to Vasagatan—Drottninggatan and on to Kungsgatan.

» 5: Construction of Skarpnäck line.

» 6: Lines 16 and 17 taken under water at Liljeholmsviken to Slussen and Lower Norrmalm (23.21).

During stage 1, development can be carried out in the areas served by the Skanstull lines: Bagarmossen, small areas in Tallkrogen and in the region of Sköndal, as also Bandhagen and Högdalen. During stage 4 Rågsved, Farsta, Södertörns villastad (garden city) and Ormkärr can be developed. Stage 5 does not provide any facilities for development in the city limits (22.221).

The lines 11 and 12 were serving on January 1st, 1951, about 46,000 inhabitants. With full development in the areas served by these and connecting lines within the city boundaries it is estimated that the western suburban lines can serve about 116,000 persons, which is rather less than the estimated capacity for stage 2. Thus on the west side, it is not the communications which govern the rate of development, but the decisive factor is local building conditions (23.222).

In the south-west, remaining small areas in Hägersten and Västertorp, as also the whole of Fruängen, can be developed during stage 3. Other areas cannot be dealt with until stage 6 (23.223).

Including the quota for 1951, ground for about 200,000 inhabitants will be available during stages 1—5. With a mean annual production of 20,000 room units this would suffice up to the end of 1960. After that the ground for building will rapidly be exhausted (23.224).