ESPOO: A NEW TOWN FOR FINLAND

by

Verne Judson Knoll

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF MASTER OF ARCHITECTURE AT THE
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ABSTRACT

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Submitted in partial fulfillment of the requirements for the degree of Master of Architecture at the Massachusetts Institute of Technology

The object of this thesis is to present a proposal for a new town in the metropolitan area of Helsinki, Finland. This proposal is intended to be a reasonable urban environment responsive to the present ecological, economic and social trends of this specific area. This problem was initially put forth in an international design competition issued by the Finnish government in 1966. The city is to be a regional governmental subcenter with an eventual population of 75,000 in the year 2000.

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Title: Associate Professor of Architecture
Lawrence B. Anderson  
Dean, School of Architecture and Planning  
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Dear Dean Anderson:

In partial fulfillment of the requirements for the degree of Master of Architecture, I hereby submit a thesis entitle, "ESPOO: a New Town for Finland."

Respectfully,

Verne Judson Knoll

December 1968
ACKNOWLEDGEMENTS

I would like to express my gratitude to Professor Jan Lubicz-Nycz whose criticism and encouragement have proven most valuable to me in the development of this thesis.
BACKGROUND INFORMATION

GOALS

The basic goals and information relating to this project are drawn from the official international competition program for the design of a center for the Township of Espoo, Finland. The following is a synopsis of this program as it is directly related to this thesis submission.

"The aim of this competition is to obtain ideas and proposals for a new administrative town center to be built in the near future. The center should represent a high standard architecturally, should be functional as regards traffic and economically feasible.

On completion...the new principal center of Espoo, will be the most important administrative center of the western metropolitan area of Helsinki... According to estimates, there will be 90,000 inhabitants in the immediate sphere of influence of the center, (in the year 2010) and 320,000 inhabitants will be living in its administrative sphere. The competition does not aim at a final solution of the town plan, but at illustrating various
possible ways of creating a town center in the competition area."
LOCATION

The Helsinki metropolitan region is by far the largest and fastest growing urban area in Finland. By the year 2000, it will contain 1,500,000 people, one quarter of the total population of Finland. To relieve the already congested old city center, subcenters of about 50,000 to 100,000 inhabitants have been proposed by the Finnish government. Four of these subcenters are located in the township of Espoo to the west of Helsinki. The most important of these will be the new principal center of Espoo. The other three regional subcenters are Tapiola, Leppavaara and Kivenlahti.

Of the three main roads associated with the area the Tarvo Motorway is the most important route into Helsinki. The coastal radial road, the Jovas Motorway, mainly serves local traffic, but future development along the coast and to the west will make it a primary route to Helsinki. A ring road encircles Helsinki at a distance of 15 to 20 kilometers and serves to stabilize long distance traffic around Helsinki.
TOPOGRAPHY AND LANDSCAPE

This area is typically Finnish, being rather hilly with elevations ranging from 0 to 70+ meters above sea level. A product of glacial activity, the relief of the terrain varies greatly. Typical are long valley formations whose floors have become covered with as much as 40 meters of soft silt and loam. Thus, the valley floors' soil bearing characteristics make them unfavorable for construction. Moving upward from the valley floor the surrounding hills' soils' load bearing properties for construction improve markedly.

The landscape of the area is also closely related to the general soil characteristics of the area. The river valleys are devoted to light agrarian activity, while the rocky hill tops are generally covered with substantial growths of coniferous trees.
CLIMATE

Although the Helsinki region lies at the relatively extreme north latitude of 68°, just below the arctic zone, it is warmed by a branch of the Gulf Stream and the Baltic Sea which produces a surprisingly temperate climate. The resulting average monthly temperatures are only about 6 to 8 degrees cooler than those of Boston, or about the same as those in the Great Lakes region of the United States. However, the extreme north latitude strongly affects the amount of sun light available. Significantly, the sun's angle at noon on December 23, is only 6° and daylight is available for less than four hours. The moderating effect of the ocean currents produces much precipitation and often overcast skies. And, this along with short daylight periods produces a dark, wet winter climate. The winds in the area are normally light (1 to 6 knots), or moderate (6 to 22 knots). Being rather evenly divided between the different quarters, they are not a significant factor in planning for this project.
DIMENSIONING OF THE ESPOO CENTER

The actual physical program, the various areas and space allocation used in this project are primarily derived from the Espoo competition program. Since this program is only for the town center of Espoo, many of the dimensions had to be extrapolated upward to cover the entire town. In expanding the program to cover the full range of activities attendant to a city of 75,000 people several modifications and additions were necessary. The resulting program is represented in chart form which has been broken down into three time phases and into functions relating to the Espoo region and to the city itself. Sources for the additions to the official competition program are also listed.
SPECIFIC GOALS

The first planning consideration for Espoo was the selection of a site area within the Helsinki regional plan. The site chosen lies on a plateau of land well west of the present scattered village of Espoo. One of the initial goals of the Helsinki regional plan is to create regional subcentres as an alternative to uncontrolled suburban sprawl and its attendant congestion of the old city centre. I propose that Espoo centre be part of a true ring development of regional subcentres about 25 kilometers to the west of Helsinki. This development could serve to connect both existing and proposed projects in the area. Moving from the southwest to the northwest, this ring development could serve the proposed recreation area around the Bay of Espoo, the proposed subcentre at Kivenlahti, the proposed international harbor at Batvik, the existing industrial town of Kauklahti, the proposed subcentre of Espoo, and the existing town of Nupuri.

A heavily wooded plateau immediately to the east of the site, which has been designated as a recreation preserve, would serve as a greenbelt further insuring the separation of Espoo from the immediate western suburbs of Helsinki. The Tarvo Motorway to the north, the Jorvas Highway to the south, and the proposed railroad line provide easy access to Helsinki.
AN EVOLVING FLEXIBLE GROWTH FORM

Every urban design proposal attempts to integrate the diverse and frequently conflicting functions of urban life into a recognizable pattern or system. Each problem has intrinsic properties which influence the final composition of that pattern. The designer strives for economy and clarity in his proposal, assuming simplicity is preferable to complexity and order better than confusion.

The design of a city involves one critical factor infrequently found in other design problems; that of evolution. The city is a living, changing organism; and its pattern must recognize and integrate successfully this factor from the onset, if it is to be a viable solution. If evolution is to be one of the prime determinants of the urban form, then flexibility must be one of its essential characteristics. The system must be able to readily accommodate both foreseeable patterns of change and unanticipated new directions. There is, however, a limit to this flexibility. A living organism is adaptable within certain boundaries. Its basic configuration can accommodate certain ranges of conditions, such as hot or cold or lack of water or oxygen. Once these limits are exceeded the organism would have to change its basic configuration to survive. This being impossible, it dies. The characteristics of a city are quite analogous. We have a dynamic organism
capable of adaptation, but the enormous physical investment commits it to a basic configuration which defines its range of adaptability. When the forces for change exceed the urban form's capacities of adaptation, the city fails to meet the needs of its inhabitants; and, in effect, it dies. Thus the designer must be extremely careful in setting the initial pattern of development, so that it will be able to accommodate a reasonable latitude of change.

But the form which a designer may propose for a given urban problem has potential beyond merely accommodating and reflecting certain intrinsic design directives. An effective pattern should also serve as a powerful input for structuring growth of an urban form. A design proposal which fully utilizes its potential to impart a powerful, but flexible growth intent to the evolving pattern is what I care to call a growth form. In creating a growth form for Espoo, I have selected a limited number of pertinent design considerations peculiar to this problem.
The formal solution which this thesis proposes for Espoo responds to the strong ecological considerations of the area. Once the general site area was established from regional planning criteria, investigations of local site conditions could be made. Of primary importance here is the characteristic pattern of the soil's construction load bearing capacities. The river valleys with their deep layers of unstable silt are generally unfeasible for construction; however, as the elevation of the land increases there is a corresponding increase in the soil's suitability for construction.

In response to this condition a general schematic section relating soil bearing and construction density was formulated. Light construction would occur on the lower slopes increasing in density as one moved up the hill side, with the hill tops themselves carrying the high density, heavy elements of the city. By adding the critical factor of sun the orientation of these sections could be established. These factors created a basic map of land areas suitable for construction, emphasizing the hillsides with a southern exposure.

The next input added to this schematic plot was the locating of suitable movement corridors along relatively constant contour lines. From this the basic pattern of major access
roads within the city could be established. These would run along semi-continuous valley formations connecting the points of high density.
SCALE

Of fundamental importance is the achievement of environmental scale which is in the character of a community of 100,000 persons.

The formal solution represents a strong physical form with growth intention, but it has very different characteristics from the mega-form concepts responsible for many urban proposals recently.

The environmental scale within the urban pattern is not the scale of the whole entity as in the mega-form concept, but the scale of local functional spaces as in the more traditional planning forms.

The object of form considerations in the case of this study is to minimize the continuity of the urban element without losing its potential efficiency. The key to maintaining the effective urban pattern lies in the movement system which in turn does not make undue imposition on the local form. The imposition which the system does make is based on the movement system's own rational response in evolution to the ecology of the area and not an arbitrary response such as a grid block system.
The small blocks of structure, internal and external functional spaces, are bounded by pedestrian and vehicular ways, creating a kind of spatial scale highway.

The center has been planned very tightly even along its hard edges. In so doing it is possible to provide a reasonably accessible nature environment and still maintain the potential continuity and identity with the community. The density increase can support the necessary reinforcement elements for vehicular and pedestrian circulation patterns.
APPENDIX FROM THE PROGRAM
PART B: FACTS ABOUT THE COMPETITION AREA

from the program, International Competition of Ideas for the Centre of Espoo, Finland 1966 - 1967

31. LOCATION OF THE COMPETITION AREA AND ITS POSITION AS PART OF THE HELSINKI REGIONAL PLAN.

31.1 The township of Espoo is part of the metropolitan area of Helsinki, the capital of Finland. At the turn of this century, the total population of the metropolitan area is estimated at 1,500,000. The total population of Finland, according to estimates, will then be 6,000,000.

31.2 The main centre of the metropolitan area is the centre of the city of Helsinki which, simultaneously, is the main centre of the country. This centre is surrounded by the main city area which has 300,000 inhabitants.

31.3 Outside this main city-area, sub-centres of about 50,000 to 100,000 inhabitants have been envisaged. Five of these are now taking shape to the west of Helsinki and four of these are situated in the township of Espoo. The most important of these will be the competition area, the new principal
centre, Espoo, now to be planned. The sub-centres are Tapiola, Leppavaara and Kivenlahti. The estimates for their growth are shown in the illustration 2.

31.4 The fifth western sub-centre is Kirkkonummi. It lies south-west of the township of Espoo, near an industrial and harbour area now taking shape at the western end of the Jorvas Motorway, the coastal railway and the ring-road.

31.5 Due to its geographical location, the main centre of the metropolitan area, Helsinki, is a terminal town, and this results in a network of radial highways.

31.6 Helsinki is growing radially, along the main highways and the railways. The early growth of the town took place mainly along the railways, but nowadays, under the influence of the sea, the city is growing mainly to the west and the east. The longer the distances, the stronger the tendency to radial growth.

31.7 Three of the seven main radial traffic routes leading to Helsinki cross Espoo. From the point of view of the competition, the northernmost of these
routes has little significance, because it mainly serves the long-distance traffic to Pori direction and in Espoo crosses large areas meant for recreational purposes.

31.8 The middle route is the most important of the routes leading westwards from Helsinki. In the township of Espoo it has been divided into two routes. The old Turku highway now serves as an important local traffic route, and the new motorway, the Tarvo Motorway, mainly serves long-distance traffic to Turku direction.

31.9 The southernmost radial main route, the Jorvas motorway, follows the coast. At the moment, it mainly serves local traffic and even later it will be the main route to Helsinki for the western sub-centres of Tapiola, Kivenlahti and Kirkkonummi.

31.10 The coastal railway, which at its Helsinki end runs between the above-mentioned old Turku highway and the Tarvo Motorway, and further off follows the ring-road, is a very important mass transport route, especially when the railway has been electrified to Kirkkonummi, which will, according to information
now available, take place in 1968.

31.11 In order to develop train traffic to the west from Helsinki, a new railway route has been prospected, to branch off from the present tracks at the Espoo railway station. It would lead to Turku through Lohja and Salo and, through train ferry connections, to Sweden and Continental Europe. The two suggested railway directions have been marked on the 1:10,000-scale standard map.

31.12 The most important ring-road around Helsinki is the outer ring-road, which encircles the centre of Helsinki at a distance of 15 - 20 kms. The inner ring-roads are, at the moment, less clear as to their function, and they mainly serve local traffic of the metropolitan area. When a ring-road is mentioned in this competition programme, it always means the main ring-road mentioned above, which crosses the competition area from south-west to north-east.

31.13 Besides stabilizing the long-distance traffic, the ring-road has good prospects of developing into a traffic route serving industry and trade in the metropolitan area itself. Using the radial roads, the
ring-road offers easy access to Helsinki, the main centre of the metropolitan area, and to the national main highways.

31.14 At both ends of the ring-road, at Batvik and Vuosaari, rapidly developing medium heavy industry has been located. The same holds true as regards some crossings of the ring-road and radial routes (Kauklahti, Hameenkyla, Vantaa and Tikkurila, among others).

31.15 Both at Batvik and Vuosaari there are good prospects for building harbours serving foreign trade. At the western end of the ring-road, at Batvik, the harbour plans are nearer realization.

31.16 The ring-road is very important to Espoo as almost one third of the road is inside the township of Espoo and as it is as centrally located as the traffic routes leading westwards from Helsinki through Espoo.

32. LOCATION OF THE NEW PRINCIPAL AND ADMINISTRATIVE CENTRE OF ESPOO.
32.1 When searching for a location for the Espoo administrative centre, the location shown by the competition maps has been chosen. It is in the proximity of the Espoo Old Church and Espoo Railway Station.

32.2 It has good traffic connections with the main centre of the metropolitan area, Helsinki and, along the ring-road, with main national highways, with the Helsinki Airport, which is situated at a distance of 25 kms, and with the harbours planned at both ends the ring-road.

32.3 It will be rather easy to establish traffic connections between the new principal centre and the three sub-centres of Espoo with the assistance of now existing roads and traffic routes to be built in the future.

33. COMPETITION AREA

33.1 The basic area of the competition is the area A which is shown on the 1:10,000-scale standard map. This area covers the future administrative centre of Espoo together with its support area
and close sphere of influence.

33.2 The centre itself should be located approximately at the central area of the Area A, in the vicinity of the main traffic routes and the old church centre, in competition area B.

Office map 1:4,000 and Vertical aerial photo 1:4,000 cover the competition area B.

34. TOPOGRAPHY OF THE COMPETITION AREA

34.1 In contours, the terrain is typically Finnish. The absolute altitudes, measured from sea level, alternate between 0 and +70 metres, taking the whole area into consideration. As the competition maps show, the relief of the terrain varies greatly. Typical are long valley formations and rocky, steep hills bordering on them. The rock of the hills is partly visible, partly covered by moraine, gravel or sand. In the valleys the surface of the land is normally under the level +25m.

34.2 The most notable - even as regards scenery - valley formation is the Espoo river valley, which crosses
the competition area from north-east to south-west.

34.3 In the middle of the competition area, immediately to the north-east of the Espoo railway station is the filled-in Kirkkojarvi Lake. Its altitude is +5 m.

35. LANDSCAPE SITUATION AND THE PRESENT BUILDINGS.

35.1 The landscape setting of the present central area is the result of a process which has lasted several centuries. It has been spontaneous as regards its nature, dictated by natural environment and a predominantly agrarian economy.

35.2 Rocks covered by forest, the fields in the valleys and the river have been the fundamental factors in the landscape, and this has influenced the location of the buildings. The newer buildings, uneven as to their quality and confused as regards site plans, have much deteriorated the original character of the area.

35.3 The main bulk of the buildings in this area consist of one- or two-family wooden houses built after
World War II. As the competition maps and aerial photos show, they are scattered over large forest areas.

35.4 The Espoo and Kauklahti Railway Stations are wooden and dilapidated.

35.5 The industrial buildings near Espoo station are of little significance.

35.6 The Lagstad School, situated halfway between the Espoo railway station and the Espoo church, is not architecturally important. However, the possibilities of rebuilding the site are few at the initial stage of realisation.

36. HISTORICAL MONUMENTS.

36.1 Since the 15th century the grey stone church has dominated the landscape. The parish house from a later period and the old municipal hall are an integral part of the aesthetic and functional milieu of the church.

36.2 The old Lagstad primary school opposite the church,
on the other side of the river, has no great architectural value, but it has its own importance as an element in the church milieu.

36.3 When planning their entries, competitors should pay attention to the preservation of this milieu and see to it that the church building is allowed enough space as regards the landscape and the city plan. The location here of buildings that through their size, forms or location might diminish the status of the church in the landscape would not be fitting.

36.4 In addition to this, competitors should pay attention to the fact that the river certainly has had its influence on the location of the church and that the river valley opening to the south-west and north-east is part of this scenic unity. The new cemetery located in the river valley to the south-west of the church must also be taken into consideration.

36.5 In addition to the church and the surrounding milieu, there are some other objects with either historical or milieu importance, the preservation of which in the town plan is recommended. These objects are
marked on the 1:10,000 scale standard map, with the same numbers as they have in this competition programme.

36.6 The part of the old Turku road leading from Espoo over the Lovkulla Hill with its planted trees.

36.7 The medicinal spring at Lovkulla, on the other side of the river, which was used in the 19th century, with its surroundings.

36.8 The old inn at Bembole (dating back to 1768).

36.9 The local Museum.

36.10 The main buildings of the Soderskog estate.

36.11 Gumbole Manor and its park.

37. CLIMATE.

37.1 Finland is part of the arctic zone. The winter climate is wet and cold.

37.2 The average temperature in the competition area is +5 C, the average annual maximum temperature is
+28 C and the average annual minimum temperature -27 C.

The average temperature in separate months are as follows: January -6 C, February -7 C, March -3 C, April +2 C, May +9 C, June +14 C, July +17 C, August +16 C, September +11 C, October +5 C, November +1 C and December -3 C.

37.3 The average annual precipitation is 650 mms and there are, on the average again, 110 rainy days in a year.

37.4 The competition area is, on the average, covered with snow from December 15th to the end of April.

37.5 The winds in the competition area are normally light (1 to 6 knots) or moderate (6 to 22 knots). As they are rather evenly divided between the different quarters (south-easterly winds tend to be the most frequent), they are not of any particular importance as regards planning.

38. USE OF LAND.

38.1 The appendix maps, aerial photos show with sufficient
accuracy the division of land between forest, fields, traffic and building areas.

38.2 Proprietary relationships: a) Township of Espoo, b) state, c) parishes, d) private.

The proprietary relationships are given on the real-estate map.

38.3 The division of real estate is given on the office map, scale 1:4,000 and the standard map, scale 1:10,000.

39. SUITABILITY FOR CONSTRUCTION WORK.

39.1 The suitability of the ground for construction work is given in the 1:25,000 scale map. Unsuitable grounds are the banks of the Espoo river and the surroundings of Kirkkojarvi. There are areas of soft terrain in the proximity of Espoo station which are unsuitable for building.

40. WATER PIPES AND DRAINAGE.

40.1 The main water and drainage pipes serving the area, already constructed or being planned, are shown in the 1:25,000 scale map.
PART C: DIMENSIONING OF THE ESPOO CENTRE

41. PUBLIC BUILDINGS

41.1 The Town Hall

Most of the administrative functions of the township of Espoo will be concentrated in the Espoo Town Hall, so it must have a central location. This is one of the main tasks of the competition. The Town Hall must have good traffic connections with all the routes leading to the centre and it must have sufficient parking space.

41.2 The Town Hall must be architecturally dominant in the centre. When planning it, the competitors must pay attention to the possibility of building it in stages.

41.3 The amount of office and public spaces to be included in the Town Hall is as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Popul. of Espoo</th>
<th>Office-space proper</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>100,000</td>
<td>7,000 m²</td>
</tr>
<tr>
<td>1985</td>
<td>200,000</td>
<td>14,000 &quot;</td>
</tr>
<tr>
<td>2000</td>
<td>320,000</td>
<td>25,000 &quot;</td>
</tr>
</tbody>
</table>
The above figures are approximate.

41.4 The above figures in square metres contain halls, corridors, stairs, rest-rooms and other supplementary space in addition to the actual working space, but no parking and technical space.

41.5 The public spaces mentioned in the above table include, among others, the conference rooms of the Town Council, the Board and the committees and the Main Hall.

42.1 Library, about 7,000 m² of space.

43.1 Arts Museum, about 2,000 m².

43.2 Other museums and exhibition halls which the competitors think necessary.

44.1 A church in addition to the old church.

45.1 A theatre for 1,000 spectators in a big auditorium.
and 400 in a small one.

45.2 A concert hall with a seating capacity of 1,500.

45.3 Cinemas.

46.1 Buildings for various associations.

46.2 Youth centres.

47.1 An institute for adult further education.

47.2 Higher secondary schools (the three upper classes of secondary school, vocational training schools, institutes) for about 4,000 pupils. There must be about 15 m² of floor space/pupil, and thus these schools need a total of 60,000 m² of floor space. In addition the schools need courtyards and traffic space up to 10 m²/pupil and different sports fields.

47.3 For colleges and similar schools about 400 hectares should be reserved per 10,000 students. Colleges may be located both in the centre proper, and its surroundings, as it seems fit to the competitor.

47.4 For those colleges and institutes that are not
located in the centre proper, the competitor must indicate the area reserved and traffic solutions in a 1:10,000-scale sketch relating to the general plan.

48. AMOUNT OF VACANCIES WITH REGARD TO VARIOUS OCCUPATIONS (COMPETITION AREA B)

48.1 Town Hall administration, trade
   and services  
   Central industries  
   Industrial office vacancies  
   Traffic  
   Building enterprises  
   Total amount of vacancies  
   appr. 9,000  
   appr. 1,500  
   appr. 2,500  
   appr. 1,200  
   appr. 800  
   appr. 15,000

48.2 An approximate 35 m² per job, or 500,000 m² altogether, of floor space must be reserved for this number of employees. This floor space includes the town hall mentioned in article 41, (31,000 m²). Other public buildings, on one hand, mentioned in articles 42 - 47 are not included in these 500,000 m², but are additional.

48.3 The centre must function as a whole, at all stages, from the start to completion.
49. HOSPITALS

49.1 In the centre proper there are no hospitals.

49.2 To the north-east of the future centre, in the Jorv area, a hospital of 420 beds will be built in the near future. Adjoining to it, an area will be preserved for a local hospital of 500 beds, to be built later.

50. LOCATION OF INDUSTRIAL VACANCIES.

50.1 With a view to the mass transportation of the inhabitants, the big industrial areas should be in the vicinity of the railway, in Kilo and Kauklahti. Of these, the Kauklahti area is suitably connected with the Espoo main centre and supports it.

50.2 The competitors have no reason to alter the sites reserved for the big industrial areas as shown in the master plan map. They only have to pay attention to the question of how these will affect the traffic network when planning the 1:10,000 scale plan for the use of the land and the traffic pertaining to the master plan.
51. **HOUSING**

51.1 The housing in the close sphere of influence of the Espoo centre has been grouped in suburbs of 6,000 inhabitants each in the outline for the master plan.

51.2 As the main aim of the competition is to solve the problems involved in the planning of the actual centre, the competitors only have to pay attention to the influence which the housing areas, planned according to the outline for the master plan, have on the network of streets and highways in the centre proper and in the whole area. The arrangement of the housing areas outside the centre can be schematically described.

51.3 The competitors must define the number of apartments in the centre proper and the amount of basic services needed.

Among the local basic services, shops of different kinds, primary schools, kindergartens, health centres and libraries must be listed. They must be located at walking distance from the residential areas.
52. RESERVE SPACE

52.1 Space for future institutions, which at the moment cannot be envisaged, should be reserved.

53. HIGHWAY TRAFFIC

53.1 The main highway routes constructed and now under construction, in Espoo, have been dealt with on the 1:10,000 scale standard map.

53.2 As there are several alternatives in the location of the ring-road shown on the competition maps, the competitors have the opportunity to consider whether the section of the ring-road now under construction should later be developed into a four lane road with multilevel crossings or whether it should preserve its character of a local road. In the latter case, the competitor must suggest a new route for the ring-road proper.

53.3 The competitors should suggest at least one main traffic route suitable for through-traffic, which would be in the proximity of the centre. This route should have connections with the national highway network on the north and east sides of the
area (the Helsinki ring-road, the Tarvo Motorway); on the south side of the area it should have connections with the Kauklahti industrial area, the Kivenlahti sub-centre and with the Suomenoja crossing of the Jorvas Highway. For this purpose the straightening of the Espoo-Suomenoja local road was planned earlier, with a railway crossing at Espoo railway station.

53.4 The amount of peak hour traffic in 1990 to the centre will, according to estimates, be about 4,000 pcu/h and the amount of traffic to the station about 1,500 pcu/h, or 5,500 pcu/h altogether. The amount of buses arriving in the centre has been estimated at 200 buses/peak hour. Buses serve both passengers into the centre and those continuing their trip by train.

53.5 The long-distance bus traffic from Helsinki to Turku direction now primarily uses the Tarvo Motorway, and its bus stops have been situated at the crossings of the ring-road. The competitor has to show the terminal of this traffic either in the centre itself, or in the proximity of the Tarvo Motorway, and the traffic arrangements pertaining to it.

54. PARKING
54.1 It can be estimated that parking spaces are needed for about 20 percent of the number of cars in the centre. Since the population of this immediate sphere of influence is estimated at 90,000 and the amount of cars at 400 cars/1,000 inhabitants, the total number of cars is 36,000, 20 percent of which is 7,200 cars.

54.2 The competitors must allocate the 7,200 parking spaces in the central area so that the requirements of the town structure are taken into account. The parking spaces should normally be closer than 300 metres to the basic institutions they serve.

54.3 When dimensioning the parking spaces the competitors should reserve a gross 30 m$^2$ per car.

55. RAIL TRAFFIC.

55.1 The traffic congestions caused by private cars in the centre of Helsinki will cause a rapid growth in the importance of rail traffic as a means of rapid mass transportation. After the electrification of the railway (in 1968) the journey from Espoo station to Helsinki takes approx. 20 minutes.

55.2 In the vicinity of Espoo station there must be parking
spaces for this traffic (park-and-ride). The minimum requirement would be parking space for 2,000 cars.

This can, however, be partially included in the total amount of parking space, if this area is connected with the parking space in the centre.

55.3 For those buses which take passengers to the railway station, there must be sufficient parking and maneuvering spaces close to the station, and the competitor must pay attention to the mutual relationship of the railway station and the centre.

55.4 The present locations of the Espoo, Kauklahti and Kaunianinen railway stations are satisfactory from the point of view of traffic, and there is no reason to alter them without well-defined reasons. The smaller stations between the above-mentioned will be closed later.

55.5 The competitor may freely locate the railway station building in the station area. The limits are the tunnel in the south-west and, in north-east, the bend of the tracks leading into the cutting.
The tracks between the Espoo and Kauniainen railway station will be straightened later.

It is possible that the railway mentioned in 31.11, which branches off the present railway at Espoo station and leads to the west north of Espoo Manor will be built later. Two alternative routes have been prospected for it and the land reservation is binding for the competitors.

The electrification of the railway leading through the competition area causes certain limitations to planning (security zones, etc.). At this stage it is sufficient to take into account the free height needed by the electrified tracks, which is 6.70 m from the level of the tracks.

INSTALLATIONS SERVING RECREATION AND SPORTS

Large areas ideally suited for recreation open up at the northern end of the competition area. They serve the whole Helsinki metropolitan area. A number of laid out paths and skiing tracks lead to the area.

Espoo Bay, at the south-west corner of the competition
area, serves yachting in the area. Boat quays can be built on the coast.

56.3 To the north-east side of the centre area proper, at Kasavuori, a centre for winter sports common to Espoo, Kauniainen and Helsinki has been planned. It should include a large ski-jump, two practice ski-jumps and a slalom slope, with adjoining dressing rooms and hostels.

56.4 The planning of the Kasavuori Winter Sports Centre does not come into the sphere of this competition. The competitors only have to indicate the traffic arrangements caused by the centre, schematically, and pertaining to the 1:10,000 scale map of the use of land and of traffic pertaining to the master plan.

56.5 Sites for installations serving sports typical in Finland must be indicated in the centre. These must include a stadium, a sports centre, including halls for different ball games and gymnastics, a hardpan hall for general athletes, a swimming hall and ice-hockey hall.

56.6 As regards the schools space should be reserved for a soccer field for each 400 pupils, if the schools
are located far from each other.

56.7 If the plan permits the location of the schools close to each other and also close to the sports installations mentioned in 56.5, the use of ball game fields can be rationalized, and their number consequently decreased.

56.8 The sports fields must be so planned that there is sufficient space reserved for lawn tennis, basketball and other games in addition to football fields.

56.9 The competitors should indicate space for an 18-hole golf course in the immediate vicinity of the centre.

56.10 There should be enough parking spaces in connection with the sports installations. This is left to the competitor to decide.
SELECTED BIBLIOGRAPHY


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