"The Breakthrough"

An Urban Design project for the Avenida Afonso Henriques
FOREWORD

Within the framework of a design seminar under the auspices of the Nancy Erasmus network a group of Dutch students of Architecture and Town Planning have made a design for an area situated in the town centre of Porto (Portugal). The seminar, in which groups from Spain, Italy, Greece, France, Portugal and the Netherlands participated, was organized by the Faculty of Architecture of the Porto University. For a period of three weeks they worked intensively on the analyses and the design, partially on the basis of information gathered through interviews with experts.

Prior to our stay at Porto a general study had been made of data and material about the city of Porto as a whole, as well as a more detailed study of the planning site. Soon it became clear to us that making a design for this site would not be an easy task. For several decades the area concerned has been left fallow and although plans have been made for the whole area as well as for parts thereof (among others by the architect Alvaro Siza) these plans have not been realised. In our opinion the inability to reach a consensus about plans for this area was caused by at least two factors, viz.: at the moment it is not quite clear to the Municipality what decisions are to be taken regarding future developments, and on the level of the planning area there is uncertainty about the theme and programme of the layout. This causes an impasse in the decision-making for the planning area which may also be looked upon as an inability to take a firm stand, based on analysis, on the spatial and functional contents, position and meaning of the area for the surrounding districts and for the town as a whole.

Although the area forms an inextricable whole with the old town centre immediately adjacent to it, it has gained a vital position on the level of the “whole and much larger town” as a result of spatial interventions in the past.

In other words, the planning area has obtained a strategic position which makes it necessary to design and assess spatial interventions on the spot and from all the levels of scale concerned.

Consequently we thought it necessary to make a number of analyses which would enable us to understand the present position of the planning area throughout the various levels of scale. Subsequently this would make it possible for us to determine, more accurately than before, what the contents of the programme for the planning area would have to be, and for what targets spatial, economic and/or social.

In view of the strategic position of the area the functional and spatial solutions will have a regulating influence on developments in a larger context. From recent examples in the field of town planning it also appears that the need for economic and functional developments makes new demands on the production of concepts of analysis and design and their subsequent spatial layout of town areas.
Therefore the question is not whether there should be any planning or not, but what kind of planning is applied and for what results, where and why. In the Dutch situation such questions have led to the development of specific tools for analysis and design which enable us to meet the changing demand in the field of urban dynamics. The position and set task of the spatial disciplines involved, architecture and town planning, will also have to be made clear.

The above points to a number of core problems which may function as a guideline for our approach.

1. On the level of the town of Porto there is great uncertainty about the future (spatial) developments both with regard to its meaning for the region with its economic developments and infrastructure, and with regard to the theme and the programmes for the separate planning areas in the town.

2. It is not quite clear what the strategic position of the planning area is going to be, notably its meaning regarding the programmes for the old town and its centre, as well as for the town as a whole. This position should be placed within the process of the historical development; it should also be borne in mind that spatial solutions for strategic areas have a considerable and regulating influence on the development of the town as a whole, and will in their turn become part of the history of the town.

The approach as presented in this publication results from a planning tradition we usually apply and in part also from the Urban Design and Analysis System (UDA System) used. This system may be seen as an instrument to understand the functioning of complex social structures together with their spatial reflection with the objective to recognize and understand spatial and functional coherences. By means of analyses insight is to be gained into possible and probable spatial developments on different levels of scale, as well as into the spatial programmes to be derived from them. In a society which is becoming more and more complex and, as a consequence, obscure, it is important to arrive at a general framework of concepts for the purpose of argumenting and debating planning results.
CONTENTS

Colophon 2
Foreword 3
Contents 5

1.1 The History of Portugal 7
1.2 The History of Porto 14
1.3 The planning area 23

2.1 Introduction to the analyses 27
2.2 Introduction to the analyses formal/informal 28
2.3 Analysis formal/informal 34
2.4 Analysis of the old town 39
2.5 Analysis of the planning area and its potentials 42
2.6 Analysis of formal/informal (continuation) From large to small 50
2.7 Indication of the problem 53
2.8 Vision on structure 56
2.9 The municipal traffic plan 59
2.10 Conclusions, objectives and preconditions 62
2.11 New traffic plan 66

3.1 Concept 75

4.1 Description of the plan 79

Summary 85
characteristics and/or status of the design.

Bibliography 91
1. Towns and road systems in the Roman era

1. Braga
2. Aquae Flaveae (Chaves)
3. Porto Cale
4. Eminium Coimbra
5. Conimbriga
6. Scalabis
7. Abelterium
8. Olisipo (Lisboa)
9. Cetbriga
10. Malececa
11. Salacia (Alcacer do Sal)
12. Ebora (Evora)
13. Pax Julia (Beja)
14. Serpa
15. Ossonoba
16. Baesurius
The History.

1.1 THE HISTORY OF PORTUGAL

From the moment the first human beings of whom traces can be found, appeared in Portugal, some 400,000 years ago, up to the development of the present tourist industry - one of the major national sources of income - the sea has played a decisive role in the history of the country.

In the Bronze Age (approximately 3000 to 1000 B.C.) 'castros' - settlements situated in high places for defensive purposes with houses built of loose stones and with thatched roofs - appeared throughout the country.

In 218 AD the Romans occupied the western part of the Iberian Peninsula, which they called Lusitania, they came upon two civilizations. In the north a primitive Celtic-oriented one and in the south a more advanced Mediterranean civilization. During the 500 years of Roman colonization it not only brought unity and culture, but it was also responsible for a completely new territorial division. The Romans imposed their administrative and judicial division on the Lusitanians, splitting up Lusitania into three 'conventi', which together approximately correspond with Portugal as it is today.

Roman roads were constructed; roughly speaking there was one along the coast running north - south, onto which roads running east - west connected the ports with the interior of Portugal. At the crossings of rivers and Roman roads Roman cities arose,
often forming the origin of Medieval cities. From 409 onwards the Vandals and the Swabians, German tribes that had left their country under the pressure of the Huns, invaded Lusitania. Shortly afterwards the West Goths, another German tribe, did the same in 416, thus putting an end to the Roman occupation. The West Gothic rule coincided with a sharp decline in intellectual life. The Roman Catholic Church had an enormous power, and there was a religious hierarchy. Violent anti-Semitism led to the oppression of the Jews.

When in 711 the Moors invaded the country, the Jews took revenge. They opened the gates of the cities and peacefully handed them over to the new occupiers, thus accelerating the dismantling of West Gothic society. The Moors succeeded in creating a society governed by tolerance, cooperation and wisdom. Moors, Jews, Mozarabs and Christians lived peacefully together and enjoyed freedom of worship. The influence of the Arabian presence in the northern part of the country has never been as strong as it was in the Algarve, in the south of Lusitania, from which the Moors were not expelled until 1250. This influence especially prevailed in the application of irrigation techniques, the cultivation of rice and fruit, the exploitation of ores and in the use of mechanical tools.

The first references to the Condade Portucale, a county encompassing the whole of Minho and the south bank of the Douro, turn up in the ninth century. Its name has been derived from Portucale, an important town on the mouth of the Douro, from which the present town of Porto has developed.

In 1143 Alfonso Henriques proclaimed himself King of Portugal. From that moment on Portugal was a monarchy. Its independence was later recognized by the pope. Portugal started trading with other countries. Portugal is a maritime country; offshore fishing, salt and overseas trade played a decisive role in its development. All along the coast there were places where people lived who one way or another earned their wages from the sea. It is difficult to say to what extent the geographical situation and the settlements of former Portugal deviated from the present situation. The coastal line has changed and there were more ports than nowadays. The river mouths where ports were situated, have been silted up and narrowed.

At the end of the thirteenth century economic difficulties arose. Bad harvests caused a steady exodus to the cities, that could not cope with the continuing stream of people, which resulted in scarcity of food and in breeding grounds for epidemics; in 1348 the plague reduced the Portuguese population by one third. Particularly the rich merchants tried to change the situation, for it was bad for trading and they themselves
Areas - mainly former colonies where Portuguese is spoken.

2. Areas - mainly former colonies where Portuguese is spoken.

Colonial expansion started in 1415 when Ceuta in Morocco was occupied, followed by Madeira, the Azores and the rounding of the Cape of Good Hope. Vasco da Gama discovered India in 1498. Later on Brazil, China and Japan were also discovered. The church and the state were largely involved in these voyages of discovery. The riches obtained from the colonies show in the 15th century buildings. The Gothic style, which was introduced in the 14th century, developed into an excessively decorated architectural style especially applied in churches and monasteries. This Manuelian style, named after Manuel I, who was king at that time, is littered with references to the sources of this prosperity: arms, navigation and tropical vegetation.

In Portugal itself large numbers of healthy men decided to exchange their own country for the Far East, attracted as they were by dreams of wealth and adventure. The spirit of the Renaissance sent them into the opening world, an escape from the inhibited medieval society. Gradually everybody left the countryside, which caused serious problems in agriculture because of an enormous
shortage of labour. Power was centralized in
Lisbon, enabling the city to increase its own
significance at the expense of other parts of
the country. There was no overall political
vision. Prices plummeted because of a
surplus of merchandise (also from the
colonies), and, unlike the situation in the
previous period, it was only the Royal
Family that benefited from the vast profits
from the colonial trade. As early as 1560
these factors incited several noblemen and
foreign merchants, who traded with the
king, to bring about the bankruptcy of the
Casa da India, the most important company
of the royal monopoly. It was this trade with
India that, because of the mismanagement
of the riches and the extravagant
expenditure needed for its preservation, is
considered one of the major causes of the
subsequent decline of Portugal.

In 1580 the Spaniards invaded the country,
but with the help of British troops Portugal
regained its independence in 1640. However, the treasury was empty. Portugal
asked for support from Britain and received
it in exchange for money and the colonial
cities of Tangiers and Bombay. British
influence was to last into the twentieth
century and the decline continued.

In the middle of the eighteenth century
Marques de Pombal, officially the Prime
Minister, came into power. He ruled the
country as a dictator for 22 years. His
intention was to make Portugal independent
of foreign imports and to create employ-
ment. He is credited for various initiatives to
turn Portugal into a modern nation.

When Napoleon's armies invaded the
country in 1807, the Royal Family fled to
Brazil. Led by the British marshall Beresford
Portuguese and British troops jointly fought
the French invasion. The court and the king
being away, Beresford was put in charge of
dealing with matters of state, turning the
country more into a British colony than ever
before, which the Portuguese considered to
be highly negative.
The ideas of the French revolution, the
Napoleonic invasions and the aversion to
the British contributed to the popularity of
liberalism. Many reforms were implemented
to put an end to the precarious internal and
external situation of the country. In 1822
Brazil proclaimed itself independent, thus
aggravating the already weak economy of
Portugal; this once again caused mass
emigration to Brazil.

In Portugal the Industrial Revolution started
in the latter half of the 19th century. It
meant the construction of railways, bridges
and factories, as well as an enormous
exodus from the countryside to the cities. At
the end of the nineteenth century socialist
ideas were manifested in strikes. The people
revolted against the British and the
monarchy.

In 1910 a revolution of army units, the navy
and republican factions put an end to the
monarchy.

During the sixteen years of its existence, the
new regime, which did not have a policy
programme and which functioned
chaotically, was characterised by
innumerable splits in the party and immense
instability. At the end of World War I, when
Portugal joined the Allies, the country was impoverished and demoralized. Following a military revolt a dictatorship was established which lasted till 1933. As a consequence of the continuous economic depressions and the excessive military expenditure the budget deficit had grown to such an extent that the country could survive only with the aid of loans, often granted on conditions that formed a direct threat to the existence of Portugal as an independent nation.

The seriousness of the situation induced the government to give a young professor, Antonio Oliveira de Salazar, ample powers as Minister of Finance, and he succeeded in stabilizing the value of the currency and in balancing government spending.

When appointed Prime Minister in 1932 Salazar established a dictatorship and, based on the Constitution of 1933, he founded the Estado Novo (New State), a fascist regime consisting of one party only. Although Salazar gave the country a certain economic and financial stability, this could only be achieved at the expense of great social stagnation and by using the colonial riches, notably from Angola and Mozambique. The political repression, the poverty, the colonial war and the possibility of finding work in rich European countries caused the emigration of thousands of Portuguese in the 1960s.

During the Estado Novo, modern architecture in Portugal, opposing oppression, could develop only with difficulty. The prevailing style was monumental, large-scale, usually classical and occasionally using a modern language of forms. For the nationalist regime an international movement was undesirable, for example the one that developed in North and West Europe from the 1920s to the 1940s. Modern architecture and the discussion about functionalism, clarity and simplicity were almost completely ignored by the country. In the Salazar period the government aimed at a national architecture for all Portugal.

In the 1960s the major part of the building industry was in the hands of contractors and real estate developers who were only interested in speculating and who applied themselves to high-rise building. This was made possible by technical developments and proved to be highly profitable. Most
architects have made designs for speculative building. Only for private commissions could architects work out their own ideas.

On 25 April 1974 the people and the army revolted, the Carnation Revolution. The people and the army shared the same ideas, symbolized by red carnations which the soldiers stuck into the barrels of their guns. The objectives of the new administration were to make the colonies independent, to hold free elections and to realise a democratic system of government. A large political programme was set up in order to decentralize the administrative power and to reform the Portuguese society on a socialist model.

The Minister of Housing took far-reaching measures. In order to fight speculating he nationalised banks and insurance companies, froze rents and introduced checks on profit margins and building costs.

Under the name of SAAL (Serviço Ambulatorio de Apoio Local) the Ministry of Housing started a revolutionary programme for housing and urban renewal, under which 'squad' of experts together with residents were to tackle the most distressing housing problems. These 'squad' consisted of architects, engineers, social workers and lawyers. The projects were executed by local contractors who were under contract to conform to fixed prices of rent and sale, so that extortionate prices were out of the question. Not one of the SAAL projects has been completely executed and a large number of them was not even started.

The causes are manifold; sometimes public participation was hard to realise, the municipality nearly always counteracted (for instance in matters of expropriation), and financing these many projects proved to be too much of a problem.

The projects executed are of a very low technical building quality; after a few years already the walls showed cracks, paint was flaking off and roofs were leaking. In the first place the contractors are to blame; they were not used to building for architects whose wishes they found most inconvenient. In addition, almost all the skilled construction workers the country once had, had emigrated in order to find work abroad.

The enormous housing shortage continued to exist; many people could not afford the

4. The transitional district (barrio de transição) Chelas Zona M from 1966, meant as temporary accommodation for the inhabitants of the slums to be demolished.

5. Alvaro Siza's SAAL project Bouça in Porto
minimum rental for a house and consequently, the illegal slums kept growing. The SAAL is confronted with the consequences of the fact that an effective housing policy has been lacking for many years.

Because of the disastrous economic situation SAAL was decentralized in order to economize, and now the municipalities concerned were put in charge of the various projects. They could not cope with this, and often had little sympathy for the projects, so that many plans were stopped. This was the end for SAAL.

Portugal is the poorest country but one in Europe (Greece is the poorest). There is still a lot of illiteracy and child labour. But since it joined the European Community in 1986, its economy shows the highest growth rate within the EC, which provides funds for the development of the country. Now that the economic situation of the country has improved, architecture and town planning too seem to get better chances to shake off their marginal existence.

1.2 THE HISTORY OF PORTO

The town of Porto is situated on the Douro, about three kilometres from the river mouth. Deposits of silt created a peninsula which bars two thirds of this estuary. Before the Douro reaches the sea it flows through a canyon-like valley of several kilometres, which has been cut into the granite rocks. It is here that the town of Porto arose, on the north bank of the river. The town of Vila Nova de Gaia is situated on the south bank. Further to the west, towards the sea, the country becomes gradually less rocky and slopes towards São Joa da Foz, an old fishing village. On account of the steep terrain, the houses in the old town are built terrace-wise and are accessible only through narrow and steep alleys. The first signs of a settlement on the spot of the present town of Porto date back to the first century before Christ, when Portugal was occupied by the Romans. It is favourably situated on the mouth of the Douro on steep banks that can be well defended. During the Roman occupation two settlements were situated opposite one another: Portus on the north bank and Cale on the south bank of the Douro. In the Middle Ages the place was called Portucale, which later on became the
7. The wall of the ecclesiastical fortress was formed by the closed façades of the houses.

8. Porto at the beginning of the 7th century: an ecclesiastical fortress and a trading post on the Douro.

9. In 1316 King Alfonso IV had a new wall built permitting the town to expand.

10. In the 14th century the town again expanded outside its walls.

11. In the latter half of the 18th century the town grew methodically.

name of the kingdom. The West Goths conquered the town in the 6th century and so did the Moors at the beginning of the 8th century. The Arab rule of Porto lasted only a short period of time, for in 997 the Christians reconquered the town. This is why Moorish influences were not very great.

The town as it is now, originated in the 7th century as an ecclesiastical fortress. The ecclesiastical domain had the character of a fortress because the buildings were uninterrupted, so that the houses formed a wall. Outside the wall a trading post was situated on the river and further to the north there was a Jewish quarter.

The increase in the number of inhabitants who had settled near the river and around
the ecclesiastical area, made it hard to defend the town. After the Kingdom of Portugal had been established King Alfonso IV decided in 1316 to have a wall built, which not only included the existing buildings, but also encompassed gardens and woods as an area for future expansion. The wall is usually referred to as Muralhas Fernandinas, after the sovereign who reigned at the time when the wall was built (1374). Here again the Jewish district remained outside the wall.

The colonial development had a great impact on Porto. Besides trade, shipbuilding also prospered. Monasteries were established on the outskirts of the town which owned vast property and farmland outside the town. Along the roads, of which the one to Guimaraes and Braga was the most important, there was a lot of rampant building. In the period of 1316 to 1500 the number of inhabitants doubled and Porto became the third town of Portugal after Lisbon and Coimbra.

The gold from Brazil gave the town another great impetus. Between 1717 and 1741 there were ambitious plans and activities. The Italian architect Nasoni built the episcopal palace, the famous Torre dos Clerigos as well as the new façade of the cathedral.

In the latter half of the 18th century the production of port-wines was started, the reason why many British families settled in Porto to trade. The cellars for the port-wines were in Vila Nova de Gaia, situated on the opposite bank of the Douro.

12. Ships for the transport of port-wine by the quay-side of Villa Nova de Gaia.
13. A view of Porto as seen from the quayside of Villa Nova de Gaia; in the foreground Praça da Ribiera.


Almada was appointed governor of the wine industry and he also occupied himself with the general order of the town and its urban structure. He made the plans, for instance, for the Rua do Almada, the Rua da Boavista and for the barracks on their crossing in the present Praça da Republica. Merchants and armies could travel swiftly along these roads. For these plans the fortification walls, which had lost their defensive function anyway, were pulled down where necessary.

At that time the British consul, Whitehead, also meddled in town matters. He made a plan for a square on the river, the Praça da Ribeira, and connected it with the existing main road higher up. The Praça da Ribeira formed a breakthrough in the wall on the side of the river. The new
Rua da São João meant a quick connection of the quayside with the roads to Braga, Guimaraes, Braganca, Regua, etc. In the buildings of those days neo-Classicism was dominant. A third important person was Carlos Amarante, who worked in the town as a military engineer. He solved the problem of the river under the Rua do Sao Joao and made a plan for a stone bridge with one span, which was to form a direct connection of the Praça Nova (the present Praça de Liberdade) with Vila Nova de Gaia. This bridge was to replace the pontoon bridge lying further to the west, and as a result of his ideas the low-lying suspension bridge was constructed about 1800. Apart from these civil and technical operations he was in charge of the building of the university and of the barracks on the Rua de Boavista planned by Almada.

Along the old and new arterial roads, the buildings of Porto, for which a permanent type of building had been developed, grew steadily: the so-called quintas, premises 6 metres wide and a depth of 18 metres with three floors, the ground floor being designated for shops or small businesses and the remaining floors for living. Their tall, rather narrow entrances are remarkable. This type of building still prevails in Porto.

The Industrial Revolution, which took place in Porto between approximately 1865 and 1910, not only resulted in large expansions, but also brought about a change in the character of the town. On its outskirts factories were built, often expanding into large complexes. In 1880 Porto was connected with Lisbon by
Praca da Liberdada
Estacao de S Bento
Rua das Flores
Av D Alfonso Henriques
Rua de Mouzinho da Silveira
Se Catedral
Mercado Ferreira Borges
Praca do Infante D.Henrique
Praca da Ribeira
Ponte de Dom Luis
Vila Nova de Gaia
Jardim do Morro
railway, for which Eiffel constructed a bridge across the Douro. In order to situate the station in the centre a number of tunnels were made in the steep slope. For road traffic the low suspension bridge was replaced by a double bridge, the Ponte Dom Luis I, which connected both the lower and the higher parts of the town with Vila Nova da Gaia. The high bridge was needed because the centre again and again shifted further towards an area just outside the wall, the surroundings of the Praça Nova, then called Praça Dom Pedro. In 1884 new docks were constructed, as the old ones on the Douro had become useless because the mouth of the river was silted up. These new docks, called Leixoes, are situated north of the Douro on the coast, above the town of Matosinhos.

As for housing the town did not expand methodically from 1800 to 1930, although new inhabitants, attracted by the industry, also had to be housed. The 6-metre wide long plots behind the quintas were used for the construction of alleys and one-room apartments measuring 16 square metres. Access to a so-called ilha (island) was via the building situated on the street. There arose a pattern of straight alleys, at right angles to the street. These houses are usually in an alley with buildings on one side, in a repetitive pattern. Sometimes the width of a house (not a standard type) allows building on either side of the alley. Occasionally there is some space for a green strip between two rows of houses. In every ilha there are water pipes and sanitary facilities for communal use. Besides

17. There are several types of ilhas; a single row of houses occurring most frequently.
private initiative which led to the
development of the ilhas, factory owners,
too, built houses for their workers, for
which they often applied the structure of the
ilhas. Especially the eastern part of the town
became overcrowded because of industry
and the flow of inhabitants. To mention just
a few figures: in 1930 there were 1150 ilhas
with 13,594 houses for half the number of
inhabitants of Porto.

From the beginning of the 20th century the
town has witnessed some drastic measures,
the first of which was the enlargement of
the Praça Dom Pedro. The new square, Praça
da Liberdade, changed into a broad avenue,
Avenida dos Aliados, leading upwards and
ending at the town hall, which was not
completed until 1957. The buildings got a
representative and classical character, which
was typical of the dictatorial period. Another
important breakthrough dates back from
1940; at that time it was decided to make a
direct connection between the high bridge
and the railway station. The cathedral,
previously almost fully enclosed, now came
into full view. The area (the site for which
we eventually made a plan) is still a
complete chaos, and is partly used as a
marketplace.

In the period from 1930 to 1950 the
authorities developed a building
programme, based on the idea that each
family should have its own house. In small
and randomly situated districts detached
houses, semi-detached houses or houses in
groups of four were built, of which the
residents would become owners after 25 to 30 years through a hire-purchase system. Charitable institutions, too, built houses on a small scale. The plans were not founded on an overall vision, and the districts themselves had no facilities. Therefore the programme was not much of a success.

In the 1960s the government started building rented houses in new housing estates, on the one hand to accommodate the newcomers, and on the other to improve the ilhas. On the basis of the CIAM concept, the houses were realized in apartment blocks in a belt around the city. However, they had the character of barracks, and the residents, especially those from the ilhas, were subjected to strict rules and control. The vacant houses in the ilhas were pulled down, and the land was designated for offices or luxury apartments; however, these new buildings were not always realized either.

The construction of a ring road around the town was started, for which a new bridge, the Ponte da Arrabida, had to be built. By means of this bridge the accessibility of the western part of the town was improved, which was an impetus for new developments towards the sea. The Carnation Revolution of 25 April 1974 completely changed the building programmes. All attention was now focused on urban renewal, the structure of the ilhas forming the starting point for the required development of the various areas. This so-called SAAL did not last long though: already in 1976 the regulations were reversed (see the preceding text about Portugal).

Porto saw the beginning of a lively development in architecture, called the School of Porto, in which many architects were involved and many more buildings were designed and realized than had been built during the short SAAL period. This development was not only caused by the political circumstances after the Carnation Revolution, as a result of which architects were called in to solve problems of social housing and urban renewal. It was also the effect of the long period of time in which Porto's cultural life had been able to develop rather independently of the centre of power in Lisbon. The local arts academy (at present a faculty of the Porto University), the Escola Superior de Belas Artes, briefly the School of Porto, functioned as an important stage where
ideas and experiences were exchanged and passed on to following generations. The most important characteristic of the School of Porto is the so-called Critical Regionalism. Critical Regionalism aims at retaining the regional tradition in the field of architecture, but also at absorbing foreign influences as an essential condition for its existence. Among the best known examples of the School of Porto are the works of the architect Alvaro Siza. When funds became available for large-scale projects, after Portugal joined the EC in 1986, all kinds of new plans were made. There is, for instance, a plan for an underground network and one to finish the ring road around the town, for which the construction of some new bridges across the Douro will be necessary. These plans often seem to focus on representing the town and its policy rather than on the problem areas in the town.

1.3 THE PLANNING AREA

The planning area for which we were to make a design is situated on the spot where, in 1940, the breakthrough in the old town was made and which resulted into a direct connection between the Praça da Liberdade and the Ponte Dom Luis. To realise this connection a large part of the rock in-between had to be removed and consequently a wide trench was formed with rocks on either side.

As a result of the breakthrough the previously enclosed cathedral, situated on a higher spot, now came into full view. Here
and there a street or rather an ally, hitherto situated within the enclosed structure of the old town, can now be seen. The narrow houses with their wrought iron balconies are situated along the new and busy road, the Avenida do Ponte. The railway station of Sao Bento, which was built during the Industrial Revolution, is situated on this new connection. In order to build a station in the middle of the town a tunnel had to be made through the rocks. The hall of the railway station of Sao Bento is at the end of the tunnel, against the rocks. The hall is decorated with large tableaux of coloured tiles (in accordance with Moorish traditions). Near the station there is an old church situated in a row of buildings. It lies approximately in the axis of the Avenida do Ponte so that you have a view of the whole area. The area, which became vacant because of the demolition of the existing buildings on both sides of the new Avenida do Ponte, has not yet been given a clear purpose. In spite of the plans made for the area, among others by Alvaro Siza, no actual results have been achieved. Except for a food market the area still is as it was after the breakthrough in 1940.
The following is a further explanation of the disciplines involved in the layout of the town, their interrelationship, coherence and meaning for the realization of urban society.

"Urbanistics together with architecture forms the field of action for the spatial sciences, and together with sociology and economics the field of action for politics. Politics, as a means and precondition, together with the culture of urban society form the contents and meaning of social processes. Spatial reflection is the result of these social processes and is also the cultural heritage of this urban society.

Town planning may be looked upon as urban design and urban economics (investments and land policy) going hand in hand with urban structures (logistic and communication patterns). Together with the culture of urbanization, town planning, as a means and precondition, is the cultural content and meaning of urbanistics.

Urban technology together with the culture of the town determines the content of the urban design, in which urban technology is both a means and a precondition for the cultural content and meaning of the design. In architecture there is a similar relation, building technology together with the culture of building determining the content of architecture. Here, too, technology is both a means and a precondition for the realization of the cultural content and meaning of the design."
A. View over the river.
B. Lower and upper part off the city.
C. Market for crafts (outsiders in).
D. Social services (insiders out).
E. Food market.
2.1 INTRODUCTION TO THE ANALYSES

The assignment consists in filling in the area situated on the Rua Alfonso Henriques. The north-south borders of the planning area run from the cathedral up to the church. The programme for this area requires housing on a site of 5,000 square metres. No further programme has been made.

We started gathering information in various ways in order to get some idea when making a plan. As we were dealing with a town none of us knew, and in a strange country, we got our first impressions while walking through the town. By means of literature, various maps, conversations with Portuguese people and our own frame of reference, we tried to get an impression of all that is happening in Porto as quickly as possible.

The town has several qualities which immediately catch the eye. The river Douro is one of the elements which make Porto such a fascinating town. The river and the enormous differences in height render Vila Nova da Gaia into a sort of platform, from which one can admire Porto. In Porto, too, there are many spots where balustrades have been formed from which you have a fine view of the city and the river. The area near the river is a tourist centre, both quaysides having plenty of patios and pavement cafés. In this area the famous double deck bridge Ponte Dom Luis plays an sight and connects the quaysides. The division into an upper bridge and a lower one is logical, as the town also has a lower
and an upper part (B). Spatial qualities are not only to be found near the river but also uphill in the old town with its winding, steep and narrow streets. Apart from these spatial qualities as mentioned before, there is a number of problems such as poverty and overcrowding coupled with a high level of unemployment. These problems were not investigated any further. In view of these assumptions the objective we formulated was to try and improve the social climate of the old town. Stimulating its tourist function could help to promote employment opportunities. A good idea was, for instance, to plan a market for crafts in the middle of the old town to get outsiders in (C), and providing social services such as schools, community centres etc. on the outskirts of the old town to get the inhabitants (insiders) out (D). In this way there might be increased interaction with other parts of the town which would gradually counterbalance the isolated position of the old town.

At first we could not appreciate the break made in 1940, which had divided the old town into two parts. Therefore we thought that we could use the food market, already situated on that spot, to join the two parts together again (E).

We wished to further investigate a number of assumptions, for instance the one of the old town being divided into two parts. This raised a number of questions: Is the old town really isolated? What is the cause? What exactly is the old town? Is the border all that rigid? What about tourism, what are Porto’s potentials in this and in other fields? What are Porto’s potentials in relation to the rest of Portugal? What are the plans of the municipality? We have tried to find the answers by means of analyses, some of which followed parallel lines and some followed logically. Sometimes a number of analyses answered only one question, sometimes several questions were answered by one analysis. In the analysis formal/informal, for instance, we have studied the position of the planning area in the old town, in the town and in the region etc., in other words what problems lie on what level of scale. At the same time we made a closer examination of the old town, enabling us to draw several conclusions which, in turn influenced the analyses formal/informal.

It will be clear that in the analyses we also looked into details beyond the official borders of the planning area, which, in itself, cannot be analysed since it is anchored in the rest of the town.

2.2 INTRODUCTION TO THE ANALYSIS
FORMAL/INFORMAL
(an analysis throughout the levels of scale)

"Town planning as a scientific discipline requires communication by means of a framework of concepts determined beforehand. These concepts function as a medium for the purpose of building up an argumentation and for gauging the effectiveness of the design."

We think that (the know-how of) town planning should not only aim at problem-solving methods of working, but should also try to anticipate future developments in order to
prevent (future) problems, for which the Urban Design and Analysis System (UDA System) may serve as 'a handle'. For the purpose of further examining and describing the problems and developments in the planning area we have made use of this system.

UDA System
The following text will describe our interpretation of the UDA System, a spatial design and analysis model in which we will try to give a brief yet comprehensive presentation of the part of the system we used.

"The system has been developed from the notion that it is desirable to understand the dynamics of change and the characteristics of continuities in society. The UDA System is a means which primarily raises questions and invites the user to think, decide and act, and which, consequently, also provides the answers. It more or less indicates the preconditions which, as considerations, could form the basis for the design of urban and non-urban areas. However, nothing is complete and there is no absolute truth: it is merely the attempt to distinguish a coherence from large to small, from low to high, and to be able to use it in accordance with one's own view that forms the basis of the system." (1)

Built space as well as the problems occurring in society are the reflection of social processes. The built environment arises from a need in society. It is necessary for spatial designers to gain insight into the interaction between spatial reflection and these processes. Future spatial designs and existing built situations may be improved on this basis.

The concept 'programme'.
Within the designing disciplines the concept 'programme' must be looked upon as a described future. A programme may for example give detailed guidelines for the design in terms of quantities, capacities and preconditions; it may also pronounce on the specific qualities of the space concerned. It may also be that there is no programme or an incomplete one, but that it is the function of the design to be made to investigate what programme would be possible for a given situation. "Research as well as design should be looked upon as a means to describe a possible or desirable future. Far too often research is limited to spatial sub-aspects taken from the context of a situation, whereas the design often pronounces on spatial interventions in a way that is not based on facts. The UDA System attempts to pronounce on the predictability of spatial changes by means of defining tasks and contents of parts of the programme."

A programme should do justice to the potentials that occur in a given situation: internal potentials as well as those in a larger whole. The programme is a described future and together with the characteristics of the situation it forms one whole. To a great extent the relations between the parts, the communication, determine the identity which the part concerned may occupy in the whole.
This identity generates the potential possibilities of the area. Changes elsewhere will cause shifts in relations and will subsequently also affect the potentials of the given situation and thus the programme as well.

The programme is divided into two parts:
- the contents (internal load)
- the relations with the higher and lower levels of scale (order).

Illustration 26. Relation
A. External relation.
B. Internal load.

Part/whole.
Both in research and in the development of a design there will be a part serving as a starting point, as well as a whole of which it forms a part. Each whole is built up of parts in which each part in itself forms a whole. Therefore pronouncements or findings from the part will always have a specific relation with the whole. Depending on the kind of relation insights may be gained concerning necessary interventions in other parts of this whole. Initiating a change in a part may follow from the necessity to restore the balance of the whole or, possibly, to disturb the balance and bring about shifts in the whole.

Consequently, a change in a part may influence the layout of other situations across the borders of its own situation, and call for and cause the necessary interventions there. Tracing these interventions is one of the tasks of the design process, for it shows the spatial consequence of a design.

Recognizing and labelling differences.
A developing task at district level will have a different content and know other means concerning the concepts of form, structure and function, than those which play a role in a developing task at a regional level.

The division according to levels of scale could be as follows (table of scales, 27). It also indicates what the formal levels could be. (These are the levels that formally lay down what requirements the layout of the area indicated have to meet and that determine its programme, planning levels.) In line with the idea that a part always has a relation with the whole, it is evident that designing has the task to integrate the contents of the two adjoining formal planning levels.
1. Table of scales.

Sizes of scale. The sizes of scale given as well as their geographical characteristics are laid down as principles and form starting points to define the borders of the levels of scale. For this purpose it is necessary to investigate where the borders of the levels concerned are situated, which will involve aspects of a social, economic, historical, political, psychological and spatial nature. In each situation to be considered the position of these borders must be determined again. A situation may also arise in which large geographical differences will occur concerning these aspects of the relevant borders; for instance social borders that do not coincide with political or spatial ones.

2. Formal/informal.

The essential factor is the dominance of movement as an aspect of (logistical, spatial and/or social) communication within areas to be marked geographically. The dominance of this movement will exert a regulating influence on the area concerned. A particular use follows from a social need, as a consequence of which the layout will fall in with the use. This dominant motion is called the formal motion (which influences function and manifestation).

"The concept ‘formal’ also says something about the relation throughout the levels of scale and, consequently, it can only concern the external form; that which is open to objectification. The concept ‘informal’ says something about the content, the unformable (that which cannot be formed) on the level concerned; that which is subjective."

Formal movements and/or developments are capable of causing a division in an area which will afterwards dissolve into parts of a lower level of scale. So formal motions go across the bordered area considered. They attract developments of functions belonging to a higher level of scale than the one considered, as they connect various bordered areas. So, formal movements attract functions concerning the character of the areas connected (under the influence of the area crossed). The extent of formality depends on the length and continuity of the line as well as on the nature of the areas it connects.

Here is the table for reference:

<table>
<thead>
<tr>
<th>number of people</th>
<th>scale</th>
<th>geographical characteristics</th>
<th>nature of formal level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1m</td>
<td>reach</td>
<td>ergonomics</td>
</tr>
<tr>
<td></td>
<td>3m</td>
<td>private space</td>
<td></td>
</tr>
<tr>
<td>4/6</td>
<td>10m</td>
<td>house(place)</td>
<td>allotment</td>
</tr>
<tr>
<td></td>
<td>30m</td>
<td>environment(space)</td>
<td></td>
</tr>
<tr>
<td>90/180</td>
<td>100m</td>
<td>street</td>
<td>purpose</td>
</tr>
<tr>
<td></td>
<td>300m</td>
<td>neighbourhood/district</td>
<td></td>
</tr>
<tr>
<td>9Th/18Th</td>
<td>1km</td>
<td>district/area</td>
<td>urban design</td>
</tr>
<tr>
<td></td>
<td>3km</td>
<td>area</td>
<td></td>
</tr>
<tr>
<td>300Th/600Th</td>
<td>10km</td>
<td>town</td>
<td>townplanning</td>
</tr>
<tr>
<td></td>
<td>30km</td>
<td>town/conurbation</td>
<td>(schematic town plan)</td>
</tr>
<tr>
<td>15M/30M</td>
<td>100km</td>
<td>conurbation/region</td>
<td>regional planning</td>
</tr>
<tr>
<td></td>
<td>300km</td>
<td>region/country</td>
<td>(master plan/</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>environmental planning)</td>
</tr>
<tr>
<td>............</td>
<td>1000km</td>
<td>countr(ies)/ies</td>
<td>political planning</td>
</tr>
<tr>
<td></td>
<td>3000km</td>
<td>international (EC)</td>
<td>(trade/ environmental</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>planning)</td>
</tr>
<tr>
<td>............</td>
<td>10,000km</td>
<td>continent</td>
<td>global planning</td>
</tr>
<tr>
<td></td>
<td>30,000km</td>
<td>world</td>
<td>(safety/economy)</td>
</tr>
</tbody>
</table>
Wherever a division occurs, a connection should also be made. This connection is at right angles to the formal movement and has an informal content with regard to the whole area, while it may be the formal movement of the sub-area created. It may be that the movement will stop on the higher level, which indicates that a limit has been put to the regulating formal meaning of this movement.

Illustration 28 formal relation
A. The formal movement.
B. The separation and division of the area into two parts of a lower level of scale.
C. The informal movement or the formal movement of the lower level of scale, as the case may be.
D. The separation of the parts of the lower level of scale and the informal movement of this lower level of scale.

If there is a line (let us say a road) connecting various regions, a function which focuses on several regions will have to choose one of these regions to settle in, but it will probably do so on the line cutting through the region concerned as well as connecting all regions.

We have seen that at each formal level of scale at least one dominant movement or development is to be determined which will be at right angles to that of the formal level of scale immediately below or above it. Using the principles of environmental planning we have at our disposal for urban planning and architecture and for their spatial means, the potentials (retaining their own identity) will have to be shaped.

Twin phenomena.
The layout of space is the result of the reciprocal influence of cultural, political and economic aspects and insights. Where the urban design pronounces on the layout of the space, subsequently laying down the preconditions from which the user derives his spatial frame of reference, it is important to understand this process and thus apply the spatial means.

In order to define and describe space, one has to use differences/contrasts. As already indicated by the concept ‘difference’ its meaning and value can only be indicated by means of a contrast (antonym). Contrasts are expressed through twin phenomena and may have various contents depending on the discipline concerned.
The following division (in couples) can be made:

<table>
<thead>
<tr>
<th>informal</th>
<th>formal</th>
</tr>
</thead>
<tbody>
<tr>
<td>nature</td>
<td>culture</td>
</tr>
<tr>
<td>chaos</td>
<td>order</td>
</tr>
<tr>
<td>freedom</td>
<td>bondage</td>
</tr>
<tr>
<td>incident</td>
<td>structure</td>
</tr>
<tr>
<td>individual</td>
<td>collective</td>
</tr>
<tr>
<td>identification</td>
<td>recognition</td>
</tr>
<tr>
<td>psychology</td>
<td>sociology</td>
</tr>
<tr>
<td>informal</td>
<td>formal</td>
</tr>
<tr>
<td>form</td>
<td>function</td>
</tr>
<tr>
<td>complexity</td>
<td>simplicity</td>
</tr>
<tr>
<td>variety</td>
<td>monotony</td>
</tr>
<tr>
<td>discontinuity</td>
<td>continuity</td>
</tr>
<tr>
<td>architecture</td>
<td>town planning</td>
</tr>
<tr>
<td>object</td>
<td>project</td>
</tr>
<tr>
<td>decentral</td>
<td>central</td>
</tr>
<tr>
<td>deregulate</td>
<td>regulate</td>
</tr>
<tr>
<td>decentralisation</td>
<td>concentration</td>
</tr>
<tr>
<td>concentric</td>
<td>radial</td>
</tr>
<tr>
<td>dependent</td>
<td>autonomous</td>
</tr>
<tr>
<td>private</td>
<td>public</td>
</tr>
<tr>
<td>subjective</td>
<td>objective</td>
</tr>
<tr>
<td>labelled</td>
<td>anonymous</td>
</tr>
<tr>
<td>active</td>
<td>passive</td>
</tr>
<tr>
<td>connect</td>
<td>separate</td>
</tr>
<tr>
<td>blend</td>
<td>segregate</td>
</tr>
<tr>
<td>divergence</td>
<td>convergence</td>
</tr>
<tr>
<td>heterogeneous</td>
<td>homogeneous</td>
</tr>
<tr>
<td>diversity</td>
<td>universality</td>
</tr>
<tr>
<td>extensive</td>
<td>intensive</td>
</tr>
<tr>
<td>emotion</td>
<td>ratio</td>
</tr>
<tr>
<td>concrete</td>
<td>abstract</td>
</tr>
<tr>
<td>induction</td>
<td>deduction</td>
</tr>
<tr>
<td>diverge</td>
<td>converge</td>
</tr>
<tr>
<td>division</td>
<td>unity</td>
</tr>
<tr>
<td>unlimited</td>
<td>limited</td>
</tr>
<tr>
<td>simulation</td>
<td>reality</td>
</tr>
<tr>
<td>intolerance</td>
<td>tolerance</td>
</tr>
</tbody>
</table>

The twin phenomena constitute the framework of concepts, both on the formal and the informal level. They define the difference to be observed and occur simultaneously. (2)

Use.
We have used the method for the following steps: getting to know the town, intervening in the town (control), tracing the urban development in terms of dynamics, change and continuities; finding the most logical site for a particular function, the most logical function for a particular site and, last but not least, coaching the process of analysis.

Within the analysis we have looked for the status and the possibilities of connecting lines and the influence we can exert (manipulation of the status of the lines). You can manipulate developments by changing the status of the lines. For example, by shutting off a line or connecting it in a different way, you will change the status of a line, and accordingly the use on and of the line.
2.3 ANALYSIS FORMAL/INFORMAL

On the basis of the following drawings we will outline the most important developments, from large to small.

As already mentioned in the previous section (2.2) it is important to mark out the borderlines (sizes of scale) first, in which aspects of a social, economic, historical, political, psychological and spatial nature play a role.

A borderline can be determined for each aspect separately. However, as we lacked the time to collect and incorporate all this information we could not possibly do so.

The principles of analysis as described in the UDA System can nevertheless be applied as long as the main line is followed. Mistakes, if any, made in determining the borderlines are of minor importance as long as those of the area mentioned in the assignment fall within the borderlines of the aspects analysed (social, economic etc.). Borderlines become manifest between differences. The nature of these differences may change between the various levels of scale.

For example, there is a difference in language between Portugal and Spain, whereas there is a difference in dialect between North and South Portugal.

On the basis of the UDA System the following division has been made, and the borderlines have been drawn accordingly.

1. social
2. economic
3. historical
4. political
5. psychological
6. spatial
7. physiological

For this the following characteristics have been used: language, culture, function, currency, common history, geomorphology and density.

For each level of scale some (or all) aspects are valid.

Each illustration mentions the aspects on the basis of which the borderline has been drawn.
On the basis of the above criteria (1 to 7) we decided to have the borderline coincide with that of the country, and subsequently pointed out the formal and informal movements on this scale. The formal movement cuts through the bordered area considered and will therefore have an international character. It connects various countries.

The next illustration shows the direction of the movement. Illustration 32. This is a movement which in fact goes throughout the country (from West to East and vice versa). However, it is also possible to indicate the route (exact road) this movement takes, the route through Porto being of a more economic nature and the one through Lisbon of a more cultural nature.

History shows that Porto would be more suitable as a trading centre and Lisbon as a powerful political centre. (Compare Rotterdam — Amsterdam; Barcelona — Madrid; Antwerp — Brussels). The leap in the route between Coimbra and Porto may signify two things.

As soon as technology will make it possible to adjust geomorphology, and when economy, politics etc. will be ready for it: (a) either the Porto docks will be moved, or (b) the expressway to Spain will be extended. Because of this movement and the recognition of the route it follows, more suitable and less suitable locations will arise on which international activities/functions can be set up.

Wherever a division occurs, a connection should also be made; this connection is at right angles on the formal movement, and has an informal content with regard to the area considered.

In the case of Portugal we see that the informal movement goes from North to South (and vice versa). This movement is of national importance and connects various national functions.

On one lower level of scale, the regional level, we can draw another borderline. As said before, the exactitude of this borderline is less important than the fact of drawing one. Within the distinction made, however, it should be possible to indicate formal and informal movements on the level of scale considered.
In this case the formal movement on the regional level is the same as the informal movement on the national level, which is logical as this line/movement causes a division in (cuts through) the region (formal), at the same time connecting the regions on the higher level of scale (informal). Here too, there will be more and less suitable locations to set up national activities/functions.

The informal movement is at right angles to the formal movement and can be indicated as the internal connection of the region. The river (Douro), the road as well as the railway together constitute this informal line, which is of importance on a regional level. It provides the internal communication and mobility of the region and, taken together, they form its accessibility. About the railway it may be said that, besides being the informal connection within the region, it is also the formal (international) route on a national level. This might cause problems in the future, as slow trains as well as international trains will have to use one single track.
Tentative conclusions.
In order not to jump to conclusions we will restrict ourselves to conclusions on a town level. It will be evident from the previous analysis that Porto not only has potentials on the level of town or conurbation, which goes for almost every conurbation core, but that it also has regional, national and even international potentials to attract activities and functions. It goes without saying that such a development is already in progress, but these potentials made it possible for the town to develop even further.

Reasons for further research.
On the basis of our previous knowledge as described in the introduction to the analysis, we have already found that there are various problems on the level of the
planning area, such as: unemployment, deterioration, high population density, social insecurity and the isolated position of the old town. Such problems are often in the field of mobility (moving, development, training) and of communication (exchange); so they are mainly social.

Illustration 37 brings us to the point where the junction of the informal and formal line is found on the level of the planning area.

Hypothesis.
The problem has to do with the accessibility between the various parts of the old town as well as between the old town and the larger whole.
In order to prove this hypothesis we have to make a further analysis.
2.4 ANALYSIS OF THE OLD TOWN

As described in the introduction to this chapter we have observed social problems in the old town: overpopulation (with regard to density as well as to a one-sided social composition), poverty and unemployment. These problems in society are a reflection of social processes, which in turn affect the built environment. Conversely, one may say that through spatial interventions social processes can be influenced (see analysis formal/ informal). In other words there may be a relation between the social problems we observed and the spatial set-up of the old town. Further examination of this spatial set-up may provide us with information about this coherence, and so we can try to affect the social structure by means of intervention in the spatial set-up.

The old town is the larger whole of which the planning area is a part. It is important to make a clear definition of what exactly the old town is. What we call the old town is the part that was enclosed by the Muralhas Fernandinas in 1374 (see History). Illustration 38 shows where the original boundaries must have been. In the south the boundary is formed by the river, in the south-west remains of the old town wall can still be seen, the rest of this boundary now being constituted by buildings. This boundary has been reconstructed on the basis of old maps. The spatial set-up within the walls deviates from the set-up outside. Illustration 38 also shows the breakthrough of 1940, which extends into the Praça de Liberdade in the north and the Ponte Dom Luis in the south. This breakthrough divided the old town into two parts, an eastern part and a western one. Now the question is, to what extent do these parts still relate to one another, and to what extent do they still form one whole both spatially and socially.

Borders of the western and the eastern part. The eastern part of the old town is much more interwoven with the adjoining newer part of the town than the western part, which is situated in the town as an autonomous area. Illustration 39 shows that the western part has an eastern branch as well, for this part, extending under the bridge, is attached to that part by means of a long flight of stairs and is hard to reach from the eastern part. This interrelation has
also to do with the layout of the public spaces. On the boundary of the eastern part they connect the old and the new town, and as a result of their layout they are part of both. The public spaces in the western part are situated within the boundaries of the old town and are directed towards the centre. They are only part of the old town. The shape of the boundaries also plays a role in the degree of interrelationship. The western part is bounded by a solid and austere wall, whereas the eastern part has a more amorphous boundary; it is much smaller, the streets are a lot shorter, and as a result its accessibility is better. This interrelation resulted in a better development of the eastern part, where economic activities were encouraged. Another reason is the size of the areas, the eastern part being too small to function independently, contrary to the western part which is able to be self-supporting. The social problems in the eastern part seem to be less serious than those in the west. If we want to do something about the social problems we will have to direct our attention mainly to the western part of the old town. The planning area has become an outlying district of the old town, instead of an area right in the middle, which was our first idea. The old town no longer functions as one whole.

Structure of the old town.
One of the reasons why the old town is so impenetrable is its spatial structure. The streets are narrow, winding and steep. In this medieval structure there are two 'main
I. The western part of the old town divided by its main structure.

II. The three tops and the influence of their height on the old town.

streets', which are broader and more developed, the Rua das Flores and the Rua Muozinho da Silveira. These two streets used to form the direct connection with Vila Nova de Gaia via the old pontoon bridge. Apart from the structure, the incidents are also indicated in illustration 40: the Sao Bento railway station, the cathedral and an area in which a number of stately buildings are grouped together, connected by straight roads, not fitting in with the medieval structure. As incidents are an exception within the structure, they may serve as points of orientation.

In the case of Porto these incidents also contribute to the isolated position of the old town. The cathedral, for instance, is a barrier to the surrounding area, the streets cannot continue here, so that it is rather difficult to reach the area surrounding the cathedral. The same goes for the railway station; you have to go around it in order to reach the area which lies behind it.

The parts within the old town. From a spatial point of view we can again divide the western part of the old town into two parts, which are separated by the Rua das Flores and the Rua Muozinho da Silveira.

Differences in height. The old town lies against the steep bank of the Douro, and on its highest point the cathedral with its complexes of monasteries, which even emphasizes the building as an incident. The difference in height is approximately 70 metres from the highest to the lowest point. The steepest parts are either bridged by steps or not bridged at all,
as a result of which there are not any through connections. The 'main streets' mentioned before, Rua das Flores and Rua Muozinho da Silveira, follow the line to the top that is least steep, the so-called valley line. Their sidestreets, on the other hand, are very steep and impenetrable. The differences in height and especially the steepness of the streets contribute to the isolated position of the old town.

2.5 ANALYSIS OF THE PLANNING AREA AND ITS POTENTIALS

Description of the planning area.
The planning area is situated in the old town of Porto, on the line Praça da Liberdade, Ponte Dom Luis, on the spot where the breakthrough was made in 1940. The gap then made has an average width of about 80 metres and is now taken up by a wide road (four lanes, one way traffic), two service roads with parking lots, and a small food market.

The boundaries of the planning area run from the cathedral to the church in the Praça de Almeida Garret, where there is also the railway station. The rest of the area is bounded by low buildings on the west side and the face of a high rock on the east side. In the area the difference in height of about 20 metres is bridged; the lowest point is in front of the railway station and the highest in front of the cathedral. There are a number of view axes in this area, one from the steps in front of the church in the direction of the cathedral, and another one from the
junction at the cathedral across the Ponte Dom Luis to Vila Nova de Gaia. There is a beautiful view from the crest of the rock; here you can look over the old town. This is also the highest point in the planning area; it is not accessible now as the green there is private.

We have noticed that in the area elements of different levels of scale clash with one another; the small and old houses, for instance, are of an order entirely different from the wide, four-lane road, whereas the face of the rock fits in with the scale of the road; the food market is of a much smaller scale, more orientated towards the district lying behind it.

On the basis of these differences in the spatial characteristics the area may be divided into three parts, viz:

1. The area in front of the railway station
   It is this part of the planning area that forms a spatial whole, in which busy streets are bounded by high buildings (5 to 6 storeys) having an urban character. In front of the station a square has been shaped as a result of the position of a number of corners and walls. In this part of the area a connection is made with surrounding parts of the town.

The railway station is situated on the boundary of the old town, so that on the north side of the station a narrow strip of buildings has been left, which became isolated from the old town. On the south side of the railway station there is a small sidestreet leading into the western part of the old town.
2. The area near the rock
On the one hand this area is dominated by the four-lane road and on the other by the enormous rock face (-20 metres high), which remained after the breakthrough, and on which there is a private area. In terms of scale the buildings on the west side fit in with the old town, for they are low and small. Alongside these houses, on a part of the rock, there is a small food market which is marked off by means of a covering structure. At present this market functions for the district only and not for the town. In this part of the planning area there is just one sidestreet, which is so narrow, dark and underdeveloped that it is not used as a thoroughfare.

3. The area near the cathedral
This part is dominated by the cathedral situated on a high spot. As the main entrance of the cathedral is on the west side, its formal square is obviously situated there, too, and is therefore turned away from the planning area.
In this part of the planning area the cars and buses coming from the Ponte Dom Luis are directed to the eastern part of the town. At the foot of the cathedral an enormous circular pit was once made as part of a plan never executed, for the layout of the area. By means of this pit a difference in height of 4.5 metres has been overcome, so that a connection could be made with the area lying behind. This is why the clothing market held in the pit, continues further in the area. Across the Avenida Alfonso
Henriques there is an important road to the eastern part of the old town, and on this road there are quite a few shops.

Potentials of lines and places. A first idea to tackle the social problems of the old town was to stimulate developments in the fields of tourism and economy, that is to say the establishment of shops, restaurants and so on in order to attract people. In this part of the analysis the current developments have been studied as well as the potentials for future developments, in order to intervene in the right places. In the existing pattern of the old town there are streets which are developing better than other streets, either because they have particular spatial characteristics such as outline, spatial continuity, etc., or because they play an important role in opening up the town. The most important line on this level is the Praça da Liberdade, the Praça Almeida Garret with the Soa Bento railway station, and the Ponte Dom Luis, with connections on either side with the rest of the town. This line has an urban character: broad in outline, stately buildings, urban functions, etc. It is a formal line. The spatial continuity of the line is interrupted on the spot where the breakthrough was made in 1940. This part of the line does not fit in with the rest of it in terms of outline, buildings, functions and so on, but it does have the potential to function as part of this formal line. Traffic as it is now does not match the character of the line either, which is most evident on the spot of the breakthrough. Now traffic races along the four-lane road in
this area in one direction, bringing about the effect of a motorway, but the continuation of the line is also heavily overcharged, thus weakening its urban character. As a matter of fact, this problem, traffic not matching the character of the line, affects the whole inner city of Porto. In order to have the character of traffic fit in with the position of the line within the town, the through-going traffic will have to be deviated. The upper bridge of the Ponte Dom Luis will have to be relieved of traffic, for instance by only allowing traffic into the town to use the bridge and by keeping through traffic away from the inner city. That is why this problem has to be solved on a higher level of scale (see the section of the traffic plan). The quaysides of Porto and of Vila Nova de Gaia are both strongly developed as tourist centres with many restaurants, patios and sidewalk cafes. The connection between these quaysides is the lower bridge of the Ponte Dom Luis, which, however, is at present more of a barrier than a connection, because of the large number of cars using the bridge. This barrier will have to be removed in order to improve the cooperation between the quaysides. To this end the lower bridge will have to be relieved of traffic, and here, too, a solution will have to be found on a higher level of scale. The alternative is a lower bridge not allowing any cars, so that it will form a unity with the quaysides as a pedestrian precinct. In this case another solution will have to be found for cars. The analysis of the long lines reveals that there is scope for developments because of certain spatial characteristics. In the system

50. Clothing market in the pit, connected via a gate with the western part of the old town.

51. Square in front of the railway station bordered by high heads.
52. Survey of the whole planning area as seen from the railway station in the direction of the cathedral.

53. Existing rock face.

54. Accessibility to the old town.
in which lines are connected by means of junctions, which make them go from place to place, spaces are connected with one another. Lines not fulfilling a connecting function have not strongly developed.

Illustration 57, for instance, shows how impenetrable the western part of the old town is, due, among other things, to the great differences in height and the chaotic structure of the narrow streets. As a result this part behaves as an autonomous whole, lines lead nowhere in the area and consequently they do not attract people into the area, and so there has been no development.

Illustration 56 shows the connections which render access to the quaysides, thus making it possible for them to develop. If you want to develop new lines, these are the issues to pay attention to, because a line can only function within this system.

Illustration 58 shows a diagonal connection alongside the planning area, which penetrates the area lying behind and eventually reaches an open space. It is important to make the line manifest by means of simple interventions such as pavements and the upgrading of the junctions. In this way a line and the area in which it lies, will start working together and the line will not stand on its own. Apart from making these lines manifest, it is also important to value the quality of the places which are connected by the lines. In the city there are places with their own qualities which also determine the identity of the town. One way to get a hold over the town

55. The most important line through the old town.

56. Tourist development on the quaysides of Porto and Vila Nova de Gaia.
Analysis of the long lines throughout Porto.
and its identity is to label these qualities (see section Vision on Structure). In our analysis of the planning area (see before) we have labelled these places, in order to make use of this quality.

2.6 ANALYSIS OF THE FORMAL/INFORMAL (CONTINUATION)
From large to small

As was already clear in section 2.3 the analysis formal/informal could not be continued without first studying the spatial and social structures of the old town. There are certain risks involved in the detailed definition of boundaries on a small scale, because this might create the impression that the areas bordered for this analysis are autonomous, which they are not.
The areas as they have been bordered, form part of the whole and will always be related to this whole.
However, in order to be able to examine solutions and investigate problems, it may be of importance to begin with bordering these areas.

Illustration 60 shows how, before the breakthrough for the benefit of the Ponte Dom Luis, the formal line ran through the centre of the old town (compare illustration 61). This line ran from the river bank in a slanting upward direction through the area of the present railway station Sao Bento. As a result the town had a good relation with the river, which, at the time, played an important role in Porto’s economic development.
60. Old situation
area/district
1 2 3 5 6

New situation
area/district
1 2 3 5 6

62. West
quarter/vicinity
1 2 3 5 6

63. East
quarter/vicinity
1 2 3 5 6

64. vicinity/neighborhood
(west-part)
1 3 5 6

65. vicinity/neighborhood
(west-part)
1 3 5 6
The geomorphology of the old town (broken ground) permits only few long informal lines. The depth of penetration of the informal lines is not very large because of the steepness of the area. When leaving the formal line you will soon come across the steps. So the informal lines remained fairly short, and it was also because of their limited length that they could not develop themselves, and consequently remained largely dependent on the formal line.

The breakthrough in favour of Ponte Dom Luis resulted in a new division of the old town into two parts. From the preceding analysis (2.1 to 2.5) it will be clear that there has been a spatial division and a social one. And so there were two new parts, east and west. The old formal line of illustration 60 has been downgraded and has become the informal line, going into the district. Traffic from and into the city no longer follows the old formal line, for a new formal line has been made.

As a result of the division into two parts there is a narrow strip on the east side of the old town, which, in spite of its slight depth of penetration, has developed quite reasonably (analysis 2.4). The formal line through this area is the connection between the Avenida Alfonso Henriques and the area bordering on the east side of the above area.

With regard to the western part of the old town the former formal line (illustration 60) has become the formal line on vicinity level. This formal line again divides the western part of the old town into two smaller parts. Unlike the formal line in the eastern part this line is no longer a thoroughfare to other areas.

The western part of the old town formed by the ‘new’ formal line, is crossed by the ‘old’ formal line, which divides the vicinity into two neighbourhoods. The formal line is indicated per neighbourhood. If there is any pressure for development on the level of the neighbourhood it will mainly move in this direction. The fact that this pressure is not very large, is mainly caused by the decrease in importance of the ‘old’ formal line. As we said before, the depth of penetration of this development pressure is slight. Summing up the above, it may be stated that under the present circumstances the development of these neighbourhoods will not amount to all that much.
2.7 INDICATION OF THE PROBLEM
on the basis of the foregoing

On the basis of previous analyses some conclusions can already be drawn. We shall now try to indicate the reasons why, in our opinion, the planning has still not been adequately laid out, 53 years after the breakthrough was made.

Present situation.
A formal line on an area/regional and national level runs through the planning area. On one side there is the rock formation against which no activities have been developed. On the other side there is an informal route on district level that runs parallel to the much larger formal route on area/regional and national level mentioned before, and to which the informal route is connected. Illustration 66 shows this is in an abstract way.
At the moment no development can be observed in the planning area, to which no claims have been made for either route.

The formal route.
The area does not develop with regard to the formal route because the buildings are on the informal district level. The distance to the formal route is too large which is also caused by (1) the difference in height, (2) the details of the connection of the informal route to the formal one, (3) the nature of the district lying behind it and its buildings.
sub 1. The difference in height is a physical barrier. The visual qualities offered by this difference in height have not been exploited.
sub 2. The details of the connection of the informal route to the formal one is of such a small scale (in transition of material, volume and situation) with regard to the other connections present that its attraction is too slight. The informal requires its own space along the formal route in order to build up its own identity.
sub 3. The medieval structure (small and narrow streets, high density) forming the background of the informal route, is very closed. Consequently, no thoroughfares (into the districts) have been developed, and as a result this location does not attract any further developments into the district.

The informal route.
With regard to the informal route the area shows very little development because there are not enough new incentives from the old town. There is 'no natural pressure to invest' in the old town, because (1) there are no good connections with the area lying behind it, (2) the formal route prevents developments on a small scale.

sub 1. Removal of the 'natural' investment pressure on the old town. The a-central expansion of the city, the vacant grounds for new building sites outside the old town, changes in the nature and intensity of traffic and the adjustments required for the infrastructure have made the old town an unpopular object for commercial and economic investments. Traffic (and parking) problems within the old town fail to keep pace with the quick changes of the present economy in which scaling up as to communication and mobility (together
forming accessibility) has started to play an essential role. Because of the disappearance of the investment pressure (a result of the closed character of the city) the old town has not seen any further developments. New (and different) sources of investment will have to be found.

sub 2. The old town has become an isolated area (see sub 1). In our planning area the informal route now lies on its borders. Therefore, a new function for this location might have been forming a gate (entrance) for the hinterland. This has not been realised because the connections to this route coming from the hinterland, are too insignificant and form no thoroughfares.

sub 3. Small-scale investments from the old town itself are prevented by the formal route. The accessibility from the formal route is not very good, and because of its nature the formal route is a barrier on area level. It passes through the old town and has hardly any possibilities for connections.

Strategies for solutions.

Seen in terms of black-and-white two essentially different strategies would be possible:

a. A connection between the formal route and the old town. From the preceding analysis, it will be clear that within our planning area the formal route forms a connection on national level (the region), on conurbation level (the conurbation) and on town level (the districts). Consequently, the character of the investments will be such that it matches the levels of these connections. The Praça da Liberdade is a nice illustration of these developments. The old town will try to avoid the burden of these investments as well as the economic pressure that may result from it in the long run, as the buildings and the infrastructure of the city are not suitable for such an investment pressure. The question is whether the present inhabitants of the city will also benefit from this development. If it is desired to apply this strategy for solution, it would be wise to adjust the level of the road to the level of the old town, because it is not inconceivable that otherwise the old town could be destroyed.

b. Separating the formal route from the old town.

In the definition of the problem we already observed that the old town produces too few new incentives to develop the location. When the formal route is separated from the old town, all developments will have to come from the city itself.

For separating the town from the formal route there are two possible variants:

b1. The original old town is split up into two parts, each of which will have to function autonomously. The planning area, as said in the introduction to analyses, would then
be situated on the outskirts of the western part of the old town. However, the possibilities for the development of the planning area will not be very great.
b2. The original old town is restored resulting in a larger potential of new incentives (see illustration 70). In this way the planning area could become a link between the eastern and the western part of the old town.

In both variants the new developments will have to come from the old town itself (from a part of the old town (b1) or from the restored old town (b2). Experience with old city centres shows that the number of new incentives is usually insufficient and consequently strategies providing new incentives will have to be developed.

None of the strategies mentioned may be considered ideal, for they are extreme versions of the solutions that are possible. The actual strategy will therefore have to be a combination of the strategies for solutions mentioned before. Also because we think that the old town will not develop automatically, we have opted for a combination of strategies, putting the emphasis on strategy a. A connection will be made between the formal route and the old town. It should be considered that the level of the formal route will have to be lowered, which will thus obtain a strong and specific character resulting in a stronger potential (unambiguous = clear). However, this route should remain formal enough to provide the old town with the necessary incentives.

In order to make the connection, the informal lines should not only have a good introduction, but should also be continued. These lines will have to be integrated in existing routes.
In those places where the connection cannot or need not be realised, we have opted for strategy b. This part will be returned to the old town and, consequently, will be dependent on the incentives from the old town. However, as a consequence of a, there will be more incentives from the old town.
2.8 VISION ON STRUCTURE

What is a vision on structure?

This vision is a coherent theory about the various patterns in a town including a statement for what purposes these patterns can be applied. Use is also made of an inventory with pictures of the above patterns.

In this city there are places that have a clearly individual character. In this context character implies various characteristics such as amount of green, buildings and (geo)morphology. Character will be expressed in terms of quality and quantity, but also in the use made of these characteristics, which will be considered on the basis of twin phenomena as mentioned in section 2.2.

Example.
Characteristic green: The twin phenomenon structure/incident says something about the quantity of green present, variety/monotony says something about the quality of green present, private/public says something about the use made of this green.

So, by pronouncing upon the combination of these characteristics in a certain field, it will be possible to define fields having a character of their own.

Objective.

By indicating, qualifying and labelling the above characters you attach a certain value and significance to them. Characters make it possible to create a variety of environments in which one works and lives (differentiation of environment). They may contribute to the spatial build up and continuity of the town. By bringing about a limited segregation it is possible to make the town readable (i.e. to get a clear picture of the town) regarding, among other things, the functional build up and an improvement of orientation. This significance may later be applied for interventions on town level (external), on the level of the places indicated with regard to each other (intra) as well as on the level of the places themselves (internal). For specific interventions we think it is necessary to subdivide the town into smaller parts with their own characters. As these characters are independent within the larger whole, they contribute to acquiring a better insight into the town both for
planners, designers and users. However, the object of a vision on structure is not only getting an insight into the town as a whole, but also to provide designers on lower levels of scale with preconditions that may be in the interest of the town.

Vision.
In our vision the various places have been labelled and have thus been so characterised that this specific quality can be read. These names are metaphors which implies that a notion has been selected that not only indicates the external characteristics literally, but also attaches a quality figuratively.

Means.
We have several means at our disposal to express this vision on structure, for example, making a functional assignment, on the basis of the characters and attaching a number of preconditions that have to be met. These preconditions create a framework encompassing investments by the municipality, private investments and investments by companies.
These investments should be considered from the characters (bottom-up) and from the town as a whole (top-down).
The investments in public space and infrastructure are very important as they exert a certain influence on the area characterised.

We shall try to explain the above on the basis of concrete preconditions for Porto from our vision:
The object of investing in the infrastructure bottom-up is to prevent congestion of traffic which will result in a reduction of the pressure on certain parts of the town. For investments in public space the emphasis should be on management, maintenance and improvement of the quality of this space, and not on improving the possibilities for traffic and transport.

Example.
The application of the vision on structure can best be clarified by means of the following example.
In the illustration finger/concentration and wedge are shown next to each other. Finger/concentration is a metaphor for an area with urban density built up along one line of transport (public transport/car). Wedge stands for a green natural space enclosed on two sides by build areas.
By allocating qualities to these two places it is made clear that each of the characters of these places should be retained (internal). This allocation of qualities also emphasizes that they have to be retained with respect to each other (intra), green versus build areas, which will have consequences for the extension of the finger. For example, this finger may extend longitudinally and, if necessary, enclose the green wedge, but it should on no account extend into this green space.
This also implies that there may be no density of building in the wedge. On town level the result of this may be, for example, that in the wedge no traffic line may be made and that in the finger no large green area may be laid out.
We would also remark here that certain
locations in the structure of Porto are suitable for density between two fingers along a ring road which, in the case of preservation of the wedge, will result in an enclosed town park. It is true that as a consequence the wedge will change in intensity and function of its use, but its character (green) and its spatial function (separation) will remain. So, an unaltered vision of structure implies a value judgement that is creating conditions both for its own level of scale and for lower levels of scale.

The planning area.
Before the breakthrough in 1940 the planning area was situated right in the middle of the old town and consequently it could truly and unequivocally be called "old". As a result of the breakthrough, differences in height and the new thoroughfare, new characters have been formed, such as the city centre and the balustrade. Now, the planning area, as stated in the assignment, is situated exactly on the interface of the characters 'old', 'city centre' and 'balustrade'.

A confrontation between these characters will give the interface its own specific quality. However, a conflict may also arise because there is no transition between the various characters, for example, because the contrasts are too sharp and have not been shaped. This is the case in the planning area, for it does not form part of one of the three characters present. The area has not developed a strong character of its own either, and is a chaotic and unclear spot. The sharp contrasts between the characters in the area (such as, large and small scale, difference in height) require a careful approach so that optimum use is made of the quality of the interface, and conflicts are avoided.

Internal.
So there are three characters that may be described as follows:
- 'Old'. This is the metaphor of what is essential in the old town and it implies the historic structure and the buildings; large number of small-scale facilities; high density of population and buildings.
- 'City centre'. This metaphor relates to and implies large-scale functions and buildings; wide street profile with urban walls; public amenities.
- 'Balustrade'. Throughout Porto there are large differences in height and the metaphor 'balustrade' implies a view from a higher point over the river or the old town.

Intra.
In order to make use of the interface between the characters 'old' and 'city centre' it is necessary to eliminate the conflict between them, which is mainly caused by a contrast between the large-scale qualities of 'city centre' and the small scale of 'old'. On those points where 'old', 'city centre' and 'balustrade' touch each other, view is the quality of the confrontation between these two. One way of exploiting this quality is creating a townscape, thus taking advantage of the differences in height and the view axes present.
2.9 THE MUNICIPAL TRAFFIC PLAN

Introduction to the traffic analysis.
From previous analyses and observations we may conclude that the traffic situation is chaotic and that in certain spots (for example the Ponte Dom Luis) the intensity of the traffic is very high. Together with the municipal authorities we are convinced that this situation should be improved. Now that Portugal has joined the EC, funds have become available to execute the plans. By means of a discussion with a traffic expert of the Porto Town Planning Department we will try to explain the existing traffic plans of this department.

The municipal traffic plan (as supplied by the Town Planning Department) consists of four layers: 1 layer for private traffic, 1 layer for the train and 2 layers for the metro (in two phases). We shall now make an inventory for each separate layer.

Layer 1 private traffic.
The plan assumes a centralistic approach and is built up in concentric rings that are to provide a specific staggering of traffic as well as demarcation of the urban area. At right angles to these rings is a number of radials for the supply from the conurbation and the region. The plan for the inner rings in the centre is not clarified in these drawings. On road maps (e.g. Falkplan) you will see that the idea is to direct the division within the centre via rings (two-way traffic). The connections of the radials to the ring road have not been indicated exactly in the plan. In the existing situation and in the
planning it is remarkable that almost all, if not all, connections will be universal, i.e. you can reach the radial from the ring in two directions and also that you can reach the ring from the radial coming from two directions (see illustration).

Layer 2 train.
In this case we can hardly talk of a plan, for this layer is restricted to the existing situation, which is: There are two main stations, Sao Bento in the centre (in the old town) and railway station Campanha in the east of the town. The terminal Sao Bento taking care of the regional traffic to the north, and Campanha taking care of the national and regional traffic to the north as well as to the south. The two stations are interconnected by means of a railway tunnel. There is also a goods railway line from the harbour that is connected to the north-south line.

Layer 3 metro 1.
This layer represents the first phase for the construction of metro lines covering five sections. Old tram and railway tracks will be used where possible. The two lines meet in the centre so that here, too, there is a centralistic approach. The line from the centre to Vila Nova de Gaia has to bridge the Douro, for which there are three possibilities:
- across the upper bridge of the Ponte Dom Luis,
- across an appendage of the Dom Luis,
- across a new bridge next to the Dom Luis. On this line there is a bus station for regional lines in Vila Nova de Gaia, so that
the bus station in the centre of Porto is relieved. The two lines to the north seem very long for a metro line and pass for a large part through a less urbanised area.

Layer 4 metro 2.
In the second phase another two new lines will be constructed, one of which (the direct line to Matosinhos) seems to replace a part of the first phase line. The other line will mainly bridge the difference in height west of the centre and runs to a developing area where, among other things, the new university will be built.

Regional transport by bus.
We have not received any plans from the Municipality for this transport. In the present situation about 180 buses per hour cross the Ponte Dom Luis, which is a rather intolerable situation. However, we have heard that the idea is to transfer the regional bus station to Vila Nova de Gaia, so that regional buses need no longer use the Ponte Dom Luis. The new bus station can be reached by means of a metro line.

Summary.
A ring structure is a good system to distribute the traffic pressure, provided that the rings are selectively connected to the radials. By doing so in specific places you can create barriers resulting in a better distribution. As a result of the centralistic build up of the traffic system it is not only local traffic that enters the centre, but also a lot of through traffic resulting in congestions. The Ponte Dom Luis with its two single lanes does not seem capable of coping with this high intensity of traffic. Possibilities of various means of transport are not distinguished as to level of scale. The result is that the metro, for example, is used for opening up the region, but now the distances between its stops may become too long. We expect that this metro line will not pay, as it passes through areas with a population density that is too low to justify this line.
2.10 CONCLUSIONS/OBJECTIVES/PRECONDITIONS

Town planning deals with the control of social and economic processes by means of spatial interventions. Before formulating our conclusions and objectives we would like to repeat that all analyses are based on a social objective, namely the improvement of the social climate of the old town by means of spatial interventions. From these analyses we can draw conclusions that relate both to the entire city and to its parts.

Conclusions concerning the entire city.
- Many of the problems in the city are connected with the definition of levels of scale. The difference between the various levels of scale is so slight as to cause conflicts. By clearly defining the levels of scale it will be possible to solve these conflicts at the appropriate level and place. A good example is shown by the traffic problem: in the inner city there is both regional/through traffic and urban/local traffic, which results in traffic congestions. In addition there are very often too large jumps in scales, as a result of which the levels concerned cannot function properly (for example the planning area). These problems with the levels of scale are connected with accessibility (mobility and communication). This accessibility is a means to make a separation or a connection between the levels of scale and is determined by geomorphology, structure, design of public spaces and spatial continuity.

- Problems are not merely caused by insufficient accessibility, for too great a mobility may also curb development. An example of the latter cause is the congestion on the Ponte Dom Luis, and the consequences of an accessibility that is too small is the isolation of a number of parts of the old town.
- The potentials present are not optimised. The old town, for example, has a certain potential as a tourist attraction, but it is hardly made use of. Very often traffic is a hampering factor, just as it is on the quays of Porto and Vila Nova de Gaia. These quays have an enormous potential for tourist and recreational developments (view of the Ponte Dom Luis, picturesque buildings, fishermen, old port cellars). However, the high intensity of the traffic on the quays forms a barrier (noise pollution, stench, crossing problems), which make optimising this potential quite impossible.

Objectives concerning the entire city.
- Defining and demarcating the various levels of scale as well as interventions on the proper level of scale.
- Optimising the potentials already indicated on the various levels of scale and in several parts of the city.

Conclusions concerning the planning area.
- The breakthrough of 1940 divided the old town into two parts, the largest problems being caused in the western part. As a result of this break the planning area has become the outskirts of the old town instead of an area in the middle. This presents possibilities to improve the accessibility of
the old town by means of making openings thus achieving a better interaction between the old town and the rest of the city.

- The planning area is on the interface of various characters we found in the town, such as 'old', 'city centre' and 'balustrade'. This makes it possible to use these potentials in making a plan.

- With regard to the problem of levels of scale we found an enormous jump in the planning area. There is a formal line on the regional level next to an informal line on district level causing problems regarding the economic developments in the planning area.

Objectives concerning the planning area. By means of interventions we want to bring about a spin-off effect of which we expect an improvement of the social situation in the old town. The available means are:

- To complete the break between the eastern and the western part of the old town in such a way that the formal line is formally accompanied without resulting in a barrier for the old town lying behind it. This will require a transition between the various levels of scale.

- Upgrading the informal lines by making them more continuous (see section 2.7)

With its formal functions the formal line radiates to the informal lines, which is only possible if there is a certain penetrability to the informal lines and the hinterland. By increasing the penetrability, we could increase this radiation, but this will require more continuity in the sphere of space, difference in height and transition between the levels of scale. We can realise this by means of key interventions in the public space, for example, upgrading a central little square in the old town and restoring parts of the historic buildings.

The following is an example of this radiation. Praça da Liberdade is a formal square with formal functions, such as bank buildings and showrooms for cars. This square has a radiation to the sidestreets giving them a certain development, which is greater as these streets show a better continuity and/or a higher quality. The Rua Elísio Melo is a short and narrow street that ends at the Rua do Almada, which is also very narrow. The Rua Elísio Melo has shown little development because of its lack of continuity. The Rua de Trinta e Um de Janeiro on the other hand is a fairly wide, long street to the Praça da Batalha. Its functions such as cinemas, big supermarkets and night shops show that this street has a large degree of formality as compared with Rua Elísio Melo. By means of these interventions we try to initiate a spin-off effect and we expect the old town to get out of its social isolation, because there is more interaction with the rest of the town (outsiders in/insiders out).

Preconditions. The foregoing results in the following preconditions for the planning area:

1. The formal line (with the same position as the existing road the Avenida Alfonso Henriques) must have formal support and formal functions. These functions should
give the line more substance. In order to define the levels of area, district and neighbourhood in the planning area, a traffic plan should be made first, so that problems may be tackled on their proper level of scale. In the next section we shall deal with this in more detail. (75)

2. The connection between the existing formal lines east and west of the formal line, should be improved. The line entering the western part of the old town via the market place in the pit is least developed as to continuity, and passes through the area that is least developed socially; this line is suitable to start the chain reaction. This line is, so to speak, the missing link in the system of formal and informal lines in which junctions connect the lines. (76)

3. The area near the railway station Sao Bento. The eastern and western informal lines are continuous in themselves so that only a connection need be made. The formal line should be accompanied and this support should be in keeping with the existing spatial effect of the square present. The Rua Corpo da Guarda should be maintained so as to retain the existing access to the old town and the view axe from the church to the cathedral. (77)

4. The area near the rock. The east side: the rock is the formal support and we want to strengthen its character and dominant position. We also wish to make use of the potential of the private green belt on top of the rock.
The west side: the formal support will have to be created by means of formal functions (in this case exclusive, semipublic facilities). In addition we want to realise informal functions (here social facilities on neighbourhood level) showing some connection with the old town. There should be a gradual transition between the various levels of scale. (78)

5. The area near the cathedral. The informal line mentioned under 2. and penetrating the western part of the old town via the market, should have a better connection with the eastern part. The existing market place in the pit should have an entrance function to the old town enabling better penetration (79). At the angular point of the rock there should be a link between the formal and the informal line. The qualities regarding the cathedral should be secured, which means that the existing connection with the cathedral as well as the view line from the church to the cathedral should be maintained. (80)

6. A scheme stating the combination of all the preconditions mentioned before. (81)
2.11 TRAFFIC PLAN

Introduction.
In the preceding section we have drawn conclusions and established objectives and preconditions a number of which called for a traffic plan in order to provide solutions on the level of the town as a whole as well as on the level of the area mentioned in the assignment. The Municipal traffic plan mentions several solutions (see section 2.9). The way in which the traffic plan was drawn up offers no insight because no levels of scale have been defined. As a result traffic problems, if any, cannot be solved adequately, and therefore we found it necessary to make a new traffic plan.

With our plan we do not wish to suggest that we can pinpoint the exact position of all the problems or that we can solve them on the exact location(s). In this plan we specifically focus on basic principles with which the problems are to be defined or demarcated, and may thus be solved on the correct level and the correct location. Even when the correct level of scale has been defined, it will not always be easy to solve the problem.

In order to be able to read and solve such complex structures and problems (as present in Porto) we think it's necessary to split up the various types of traffic into a number of categories and scales: Public and private transport; traffic and transport on international, national, regional, conurbational, urban and area level (or district or neighbourhood level);

local traffic versus through traffic; fast traffic as opposed to slow traffic.

For the following problems, which we discovered from our own analysis, observation and discussions with experts, the municipality offers these solutions:

<table>
<thead>
<tr>
<th>problem</th>
<th>solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic congestion centre</td>
<td>Inner ring system</td>
</tr>
<tr>
<td>Radials too busy</td>
<td>More lanes, more radials</td>
</tr>
<tr>
<td>Traffic pressure national</td>
<td>Ring road</td>
</tr>
<tr>
<td>Regional amount of traffic Ponte Dom Luis</td>
<td>2 or 3 new bridges</td>
</tr>
<tr>
<td>Regional bus traffic</td>
<td>Transfer station to Vila Nova de Gaia</td>
</tr>
</tbody>
</table>

We shall first discuss the plan for private transport (motorcar), then the plan for public transport, and, based on the coherence between the two plans, we will then explain the result i.e. the new structure, as well as the complementary possibilities (such as transfer possibilities, junctions, etc.)

Private transport.
As already pointed out in the introduction of this chapter traffic has to be split up into various categories and levels of scale in order to draw up a well-structured traffic plan providing insight.

For our plan for private transport (motorcar, lorry, etc.) we have studied the traffic system in the municipal plan as well as the existing system, and have indicated the pros and cons.
conurbational/urban traffic
the internal system/the inner rings
private transport
national/regional traffic
In our opinion the municipal plan for layers will hardly anticipate the problems on the various levels of scale and the various categories. Consequently, we have split up a certain number of traffic types, which will have great consequences for the rings and especially for the connection between rings and radials. Consequently, we have split up a certain number of traffic types, which will have great consequences for the rings and especially for the connection between rings and radials.

In order to make a specific division (spreading selectively) there should be a sound system with clear barriers to keep the various categories apart. In this plan we have indicated which radials will work on which levels (see illustr. 82).

National traffic. National through traffic should be directed along the town via the part of the ring reserved for this traffic (see the map), without being tempted to take a secret route via the town or via another short cut. We are convinced that by providing correct details and by means of clearly indicated other potentials no national through traffic will end up in the other parts (roads) of the system.

National traffic destined for Porto can descend from its own road (level) to a part of the system of a lower order (level) via two exits. From these exits this traffic will reach the internal (urban) junction rings (one-way traffic) along which it can continue its route and look for its place of destination.

Regional traffic. Regional through traffic will be directed on the ring road via the western side of the town. By means of connecting and/or disconnecting rings and radials this traffic is directed in such a way that the greater part of this regional through traffic will indeed take the ring road.

Regional traffic destined for the town of Porto can join the internal system via certain radials or via the ring road mentioned above; here, too, two branches for joining or leaving have been made. (See also national local traffic.)

Conurbational traffic. Conurbational local traffic can reach the urban junction rings and roads via the radials indicated, but it will have limited possibilities for joining regional and national structures. Conurbational through and/or outgoing traffic can reach the regional or the national structure via the roads shown in the drawing.

Urban traffic. The traffic in the town will be distributed over the town via the extended Boavista (avenida, rua and the extension) or be directed via the internal system. However, we would point out that in our own view the internal urban traffic (inhabitants of Porto) is not the biggest problem and that for these inhabitants it is always possible to take different (existing) routes. This can hardly be prevented and the question is whether we actually want to prevent it. Traffic that wants to leave the town can do so in the structure indicated.

Urban traffic from Vila Nova de Gaia will enter the city across the Ponte Dom Luis bridge, but private transport leaving the city.
will no longer be possible via this bridge (only buses for the centre will still use the outgoing part of the bridge). This makes it possible to narrow the profile of the road in the area mentioned in the assignment. The lower deck of the bridge will be prepared for slow traffic (pedestrians and cyclists) moving between the lower town of Porto and the port quay of Vila Nova de Gaia. To achieve this a new low bridge will have to be constructed, which has been planned on the location indicated on the map, because here there will be the least nuisance for tourism and recreation, and traffic will have a good crossing possibility to Vila Nova de Gaia and can join the existing traffic structure.

The internal system/the inner rings. The system of the inner rings is based on three one-way traffic rings that are interconnected, each ring providing a selective distribution of traffic over the city. You can follow the ring in one direction only as far as the exit/sidestreet you want; part of these sidestreets also provide one-way traffic only, so that taking short cuts is almost impossible. By constructing these rings into each other we think that we have created an optimum system of spreading and concentrating traffic across the town. In order to finish one of these rings a new upper bridge will be required. There is a number of junctions on higher levels of scale. These roads are only partly interconnected, with the result that streams of traffic will be kept on the road of their own level of scale as long as possible (see illustration 82). The drawing shows which connections have been changed and, with regard to the existing situation (and planning), in what way.

Public transport. In our plan for public transport we have again opted for splitting up as to (level of) scale of transport, which resulted in ten types of public transport (plus 1 transport of goods). These types work on six levels of scale, namely: area, urban, conurbation, region, national and international level. The categories include the means of transport going with certain levels of scale:

- area
- town
- conurbation
- region
- national
- international
- region up to
- international

<table>
<thead>
<tr>
<th>Level</th>
<th>Minibus, (local) bus</th>
<th>Local bus, tram</th>
<th>Fast tram, fast bus, sprinter</th>
<th>Slow train, fast train</th>
<th>Intercity</th>
<th>International train</th>
<th>Goods train</th>
</tr>
</thead>
</table>

The plan for public transport aims at optimising the possibilities for (collective) public transport resulting in a reduction of the intensity of private traffic within the region but especially within the conurbation, town and city centre. By proposing a sound system of clear options and taking into account good possibilities for changing we hope to achieve this goal. In our planning map you will see what means have been used and where, and how they are connected, and so we hope to give you a good insight into the plan by means of a brief explanation (see illustration 83).
Conurbational/urban traffic and transport. Being the most important axis for conurbation and city, the Boavista (rua, avenida and extension) will bear the main internal system, the fast tram, which will be aboveground for the greater part of its route and may be compared to a metro having stops at distances of 800 to 1500 metres. At right angles to this tramline there will be buslines with fast buses and stops at distances of 600 to 800 metres; these buses will not allow people to get in or out within the same zone. People getting on in the centre may not get out in the centre. These buses will open up the conurbation from north to south and vice versa. We hope that these buses will connect specific points, via the centre or connecting to the fast tramline. For conurbational traffic sprinters will be deployed, having stops at distances of 1500 to 3000 metres, thus providing wide openings from the centre and vice versa.

Railway traffic. This traffic has been split up into the following levels:
1. Goods transport outside the city and joining the north-south networks
2. International trains going north-south and east-west from the railway station Campanha.
3. Intercity or national trains besides the international trains, but having shorter distances between stops.
4. Fast trains still having fairly short distances between stops; they connect two regional centres with each other. In Porto, for instance, this is done from the railway station Campanha to Coimbra and Braga.
5. Slow trains sharing their track with fast trains, but having shorter routes and shorter distances between stops, will connect the centres of smaller regions.
6. Sprinters going from the railway station Sao Bento to i.a. the airport and Gaia with distances between stops of 1500 to 3000 metres.

Urban networks. The conurbational/urban network as described before includes a fast tramline and at right angles to this line fast buslines; a number of local trams mainly to preserve the character of the town (tourism, recreation). The distances between the stops are 400 to 600 metres. Local buses comparable with the buses in use now with distances between the stops of 400 to 600 metres, as well as minibuses for the centre providing transport in the city centre (the old centre, centre, Vila Nova de Gaia). The principles together with allocation have been mentioned in the map, which also states the direction of the traffic.

Potentials, functions and interchange stations (transferia). By making combinations between the various categories of public transport and private transport it is possible to create/use junctions that might result in the construction of interchange stations. Regional bus traffic. In our plan the existing regional bus traffic will be directed around the centre via a new route with a new upper bridge (the same
public transport railsystem
goods/international
national/regional
one that is used for the inner rings). The new stop will form a transferium, where regional bus passengers can change to urban transport (and vice versa). This will not only provide a certain relief of the centre but also of the upper bridge of the Ponte Dom Luis. By building this transferium near the railway station Campanha and by combining it with a supply route of motorcars it is possible to create a large-scale interchange complex that will have a corresponding attraction for functions.

With our plan we are trying to achieve:
- overview
- increase of orientation
- subdivision into scales with corresponding types of transport
- clear choices for type of transport
- quicker connections (for private transport above urban level and all levels of public transport)
- concentrated pressure of traffic which will facilitate checking and result in quiet streets of a lower level
- retaining the characters of the various areas

Effects on the planning area:
- one-way private traffic across the Ponte Dom Luis into the city
- centre buses from the city across the Ponte Dom Luis
- decrease in amount of through traffic.
3.1 CONCEPT

In daily use the word 'concept' usually means a provisional formulation. However, in architecture and town planning the term may have several meanings. Apart from the many definitions used by various people we want to apply the term in the following sense. A concept makes up the basis of the spatial and programmatic organisation. The concept of the plan pronounces specifically on the field of urban design.

West side.
On the western side of the formal line there will be an autonomous element enclosed by the formal line, the view line from the church to the cathedral, and one of the connections to the cathedral and the existing street (84); the result is a triangular shape. At the market place in the pit, the level of the element is zero and is therefore equal to the level of the street. The level of the element remains horizontal, so that the sharp point of the element on the side of the square near the railway station will be 15 metres high. (85) In this way there will be a descending wall on the side of the formal line, and a small difference in height on the side of the old town. As a result of this single intervention a number of things is organised simultaneously.
In the element there are formal functions which, together with the form of the element, provide the formal support. These functions will also give the line more substance. The high point of 15 metres will stimulate
the spatial effect of the square near the railway station. On the spot where the level of the element becomes equal to the street level of the formal line, a connection is made between the informal line east and west of the formal line. This connection will be situated in front of the existing market place in the pit. This will neutralise the difference in height in the line, thus strengthening the continuity of the informal line.(86) (87)

Above the element there are freestanding buildings of an informal character. The function is social house building with corresponding social facilities, resulting in a connection with the old town. The buildings on the element are independent of the (formal) element lying below. The element serves as a sort of pedestal, and in order to preserve its formal character, it forms a boundary only on the side of the formal line, a boundary that must not be crossed. In the transitional area between the old town and the buildings on the element there are common social facilities so that this area is a public space on neighbourhood level. The high angular point is as it were the interface between the formal and the informal. By making this corner transparent and giving it a public function, interaction between the formal and informal will be made possible. The difference in height in the planning area will be used to define the different levels of scale.

The element is going to form part of the character ‘city centre’, and the buildings on the element will form part of the character ‘old’. This is to be brought about by differences in form, size and functions (see section 2.8 vision on structure).

East side.
East of the formal line there are two heads completing the corners on either side of the rock; together with this rock these heads form the formal support on this side (by means of shape and/or function).(88)
The existing green area on top of the rock will become a public park as a result of which good use will be made of the qualities of this spot, such as the view, the green as well as its peace and quiet.(91) In this way the interface between the characters 'balustrade' and 'old' can be exploited.
The entrances to the park are near these heads, together forming a route across the top of the rock.(90) (91)
When a concept was made for the buildings on the rock a number of social and spatial aspects were included. 'Outsiders in', so as to change the social climate by means of stimulating social interaction. Strengthening the character of the rock by means of shaping contrasts with loose objects on top of, in or against the rock.
The Plan.

4.1 DESCRIPTION OF THE PLAN

When we made the plan the position of the planning area within the town was an important detail. For the planning area the north-south route is the largest connection with the rest of the town.

In the plan we have expressed the continuity of this route by making use of the profile of the street. On this north-south route we have made various objects which, together with the rock, are to emphasize the formal feature of the north-south route. On the eastern side of this route is the rock, as formed by the breakthrough. On top of, in and against the rock a few loose turrets have been placed and the contrast which these turrets cause strengthens the character of the rock. The two sides of the rock are topped off by so-called 'heads', which take over the guidance the rock gives to the north-south route.

On its west side the north-south route is guided by a so-called element, which consists of functions matching the level of the route, i.e. functions which have a larger interface than, for example, that of a district level because they are situated on the thoroughfare on the level of an area. Examples of such functions are: galleries, showrooms for cars or exclusive shops.

The point of the element tapers sharply and is 15 metres high. It separates the Rua Corpo da Guarda from the north-south route and indicates the boundary between the old
town and the north-south route. Where a separation is made, there should also be a connection. Therefore the point of the element will remain transparent and its function, a 'Grand cafe', will support this interrelation.

A higher position than that of the element may be reached via the Rua Corpo da Guarda. The element reaches zero height on its other side as a result of the ascending planning area; this is where you pass the route across the element. The route links the eastern part of the old town with the western part. Where the route crosses the element there is the market. The market consists of a food market on the element and a clothing market accessible from the element. The markets are connected by means of a pergola, visually and spatially. The existing pit will be repaved for the clothing market and, passing through the gate in the rudiment, the paving will continue into the western part of the old town. The clothing market should further develop into a tourist market in the direction of the old town. The food market is situated on the element, shops supporting and bordering it on the north side. Apart from the row of buildings and shops there are also rows of social housing on the element.(97) They show a different direction than the underlying element, as a result of which the rows are independent of the element. This construction in strips is a section of the western part of the old town. This is once again expressed in the old façade where part of a strip reappears. This
is to illustrate that by means of urban interventions the old town may also benefit from future developments. By selecting a construction in strips as a typology it is possible to realise various transitional zones between private and public areas. Contrary to the houses in the old town there is more private space here. The size of the houses is limited so that differences with the houses in the old town may be bridged. The passage between the houses is divided into zones, as can be seen in illustration 98; they form transitional areas between private and public space. The architectural design provides scope for variation by means of stairs, balconies and small galleries, in order to create spaces and places. The areas between the strips do not function as streets; there are no through movements.

The area between the construction in strips and the western part of the old town is a public one (99). Here loose objects are to be found containing social facilities, like those we have seen in Porto before: a soup kitchen, a place for washing, a school for extra training and tables for homework. These social facilities are meant both for people who live in the strips and for people from the old town. The building with the tables for homework has one of its supports over the edge of the element, thus symbolising contact with the rest of the town. This building, together with the heads of the construction in strips on the element is the informal factor on the formal north-south route. On the east side of the north-south route loose objects are situated on, against and in
the rock face. Because of historical considerations we leave the rock face in view. The turrets on top of, against, and in the rock should strengthen the character of the rock face. Inside the turrets there are housing facilities meant to get outsiders in. Access to the turrets, sometimes by means of stairs, is from the street. The life style of these residents will be a much more individual one than that of the people from the old town. The individual character of the turrets will be expressed in various ways. Their orientation towards one another will vary, and in each separate turret the entrances will be constructed in different ways and in different places.

The heads are situated at the edges of the rock face. The head on the north side of the planning area, together with the point of the element and the existing buildings, completes the square in front of the railway station. The head is also starting point for the park route. A function in this head could be a building for exhibitions that is suited to the north-south route, the square in front of the station and to the beginning of the park route (101). From the square near the station a free view of the cathedral is maintained (102).

The cathedral has dominated its surroundings for ages. Its front square is on the west side and its position there has proved to be appropriate. We see no reason to create another square on the north side of the cathedral. Within the framework of our plan access is made possible by means
of a flight of stairs from the north-south route and by means of a slope starting at the element (102).

The other head is on the south side of the rock face and guides the north-south route, the park route and the route across the element. Partly because there is a market—which should become more of a tourist market at a later stage—on the route across the element, we are thinking of a tourist information office as a function in this head; this office is to boost the development of the market (103). The function of tourist information office fits in very well with our idea of doing something about the problems in the old town by means of stimulating developments, for instance tourism. When, starting from the north-south route, you climb to the entrance of the tourist information office you will have a view of the Ponte Dom Luis and Vila Nova de Gaia. Continuing your way up you will finally reach the park on top of the rock, which offers a view of the town. From this position one can follow the new developments in the old town. (104).
Summary.

CHARACTERISTICS AND/OR STATUS OF THE DESIGN

The result of the design process as described in this report can be characterized as urban design, despite the apparent architectural features of the concept. The concept is based on a large number of urban design principles which create physical/spatial conditions and also formulate requirements-related terms of reference. The form obtained results from the concept, in other words is derived from it. This also means that the forms shown in the illustrations represent a possible materialization rather than exact detailing; likewise the features of form as expressed in the scale model should not be seen as binding.

What then is the value of the illustrations accompanying the description of the plan?

STATUS OF SPECIFIC IDENTITY AS A STRATEGIC STARTING POINT.

As already stated, the form obtained is in the first instance derived from the physical/spatial conditions which we consider to be required at this location. These conditions are based on analyses of urban patterns at various scale levels. Essentially these patterns were deemed to take precedence over the significance of the architectural object. The various components are also more related to the functional features of the higher scales of the city rather than to situational, requirements-related potential. The situation, the particular area concerned, does of course have its own independent identity. Within the context of the city however, both the functional
and spatial nature of the location and signi-
ficance of the area are such that the identity
needed to acquire a different status. The
specific identity of this particular area
needed to be used as a strategic feature for
the city as a whole; as a consequence the
area has basically lost its architectural signi-
ficance.
What has been done?

THE CITY AS AN ECONOMY

In order to create an effective climate for
utilization it was essential to establish
appropriate functional/spatial relationships in
the public domain, to give logical content to
an effective relationship between functions
of flow, residential functions and areas of
trade and work. In the authors' opinion the
present relationship between private and
public transport and the way movements
are now taking place constitutes a threat to
the future of large areas of the city.

Individual parts of the city which had deve-
loped a strong identity of their own by vir-
tue of their special physical/spatial characte-
ristics often based on the past, no longer
make any specific contribution to the sur-
plus value of the city, as they are lost in an
uncontrolled development of functional
transformation. This surplus value must be
used as a physical/spatial condition for the
development of the city.

Improvement of the basic infrastructure
occurs in a manner which attempts to solve
only problems and difficulties of the infrastruc-
ture itself. But urban mobility is only to a
very minor degree a matter of infrastructure. Traffic and transport result from the physical/spatial structure of the city as a whole, from the features of the network of public space as an area to be used, from the organization of land according to functional use.

Steering by means of guided functional transformation.

Functional transformation should rarely be the purpose of change in urban areas; change should generally be the result of a well-considered aim, namely to create a clear user-friendly city plan which also provides a basic for the re-use of historic cultural heritage, in doing so instituting at city level the greatest possible physical/spatial variation and diversity.

The relationships mentioned above are depicted as a model on page 25 in this
report. The model indicates where we consider to be a task for urban design and at what levels which decisions should be taken.

Method.

The cultural background and physical characteristics of the existing spatial structure in the city of Porto were particularly important in the approach to and assessment of the analysis of Porto. The main object was to consider the features of continuity and discontinuity in the spatial development pattern of the urban area. Knowledge of these elements makes it possible to determine the direction of the next phase of development to take place in the city. This method of investigating the territorial and physical/spatial dynamic of development was based on an urban design and analysis system by the name of 'UDAS' (in Dutch 'STOA'). The method provided insight into the way various urban functions work and made it possible to diagnose urban problems and develop a strategy for the spatial and functional interventions required at various levels of scale. This report contains the conclusions, at the level of the whole city, e.g. a new, highly differentiated traffic and transport scheme and greater use of the diversity in physical/spatial features of the various urban areas in Porto.

Status of the area.

It was only after the results of the analysis had been obtained that proposals could be made concerning the content of the urban design and the spatial structure of the area. The reason for this should be clear from the foregoing. The area occupies a key position in the heart of the city, in both a functional
and a physical/spatial sense, and as such it cannot be considered and developed without taking the whole urban context into account. The architectural requirements are subordinate to this and will have to be carried out in accordance with the conditions imposed by urban design, developing and receiving its features of form in the process. As stated in the introduction to this report, we consider the long history of planning for this location to be due to a lack of tools and perhaps also to the lack of a specific urban concept in order to examine and define a solution for this particular area at the higher level of scale.

In addition to producing a design both at the level of the city and at lower levels, this report sets out to describe in detail a method of approach which we think can be important for the design disciplines of architecture, town planning and urban design. Hence the extensive description of the various components of the design process.

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