Physical Planning in Prague and Baltimore: A Comparative Study

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1. Introduction

Physical Planning is the final phase of a complex process. Physical planning involves a more precise definition of planning objectives and policies than what has been stated in current planning documents. Physical planning also exercises the projection of development principles to specific physical entities. In comprehensive and interconnected planning systems, such as the one utilized in Czechoslovakia, physical planning naturally affects or amends the elaboration of development objectives and policies in basic planning documents.

Comprehensive physical planning makes possible the achievement of optional objectives deliberately derived from a wide spectrum of partial and sometimes differing viewpoints. The methodology and content of this complex approach is still being developed in the theoretical as well as practical sense.

While comprehensive physical planning in Czechoslovakia has a past of 60 years, the utilization of a truly scientific approach was initiated during the period following the Second World War. The contemporary level of comprehensive city and regional planning in Czechoslovakia is considered to be one of the advanced articulations of urban problems in Europe. For this reason, I devote the first part of this study to a short analysis of physical planning for Prague, the Capital of Czechoslovakia. I feel that this could be stimulating for all individuals involved in further research within this branch of planning.

The second part of this study is devoted to a comparison in brief of physical planning for Baltimore and Prague. In spite of considerable differences in various factors determining the planning process within these two cities, I assume that this section could serve the needs of those wishing to obtain greater familiarity with some of the approaches and processes indigenous to physical planning in both countries.

I thank Mr. R. Perciasepe of the Baltimore City Department of Planning and Mr. P. Dombrowski of the Department of Housing and Community Development for providing an introduction as well as valuable information concerning physical planning for Baltimore City.

I would also like to express my sincere gratitude to Mr. D. Bilgin for his help in drafting this article.
2. The City of Prague - a description in brief

2.1 Some figures on Prague

Prague is the capital city of Czechoslovakia - the actual administrative, economic, social and cultural center of Czechoslovak Socialist Republic. Prague City occupies an area reaching nearly 500 km$^2$ (193 sq. miles) and has 1,192,000 inhabitants according to the 1975 census. The Prague city area covers about 0.4% of the total area of Czechoslovakia (49,400 sq. miles) and contains about 8% of the total population of the CSSR (14.9 million inhabitants according to the 1975 census).

Administratively the Prague city represents a territorial unit having the status of a region. The contemporary territory of Prague city makes possible prospective city development for at least 15 years.

Prague's metropolitan agglomeration is the actual urban unit used for urban planning purposes and involves a territory of about 3350 km$^2$ (1299 sq. miles) having approximately 1,612,000 inhabitants. Prague's metropolitan agglomeration consists of Prague city and the surrounding hinterland containing a cluster of satellite cities, towns and villages within the administrative authority of the Central Bohemian Region. The Central Bohemian Region includes 4,077 sq. miles (excluding the City of Prague) and has a population of 1.32 million. An effort to achieve congruence between the physical territory of Prague's agglomeration and its administrative status has not yet been successfully concluded.

2.2 A Brief general description of the Prague City.

The contemporary economic characteristics of Prague show outstanding economic potential in the second, third as well as the fourth economic sectors with a marked dominance of a tertiary sector.

The second economic sector represents about 10% of the total industrial potential of the republic and encompasses machinery industry, the electrical equipment industry, the production of transportation equipment, the instrument and related products industry, miscellaneous industries, the food and kindred products, as well as the production of printing and publishing facilities and materials. The machinery industry produces power plant equipment, large Diesel engines, various types of tools machines and dredging boats. Electrical equipment
production consists of equipment for power plants, electromotors, telephone switching systems and devices, small computer units and lighting devices. The production of transportation equipment is represented by street cars, electrical locomotives, and medium size trucks while the instrument industry produces various medical instruments, measuring devices and automated operational units.

The 3rd economic sector consists of important facilities and enterprises of various qualitative levels in all fields of this widely spread sector. These facilities respond to demands not only in the city, the agglomeration and in part the Central Bohemian Region but in some spheres such as business and commerce, medical care and recreational activities serve much larger territories. Cultural facilities represent an exceptional concentration of theatres (21), concert halls, museums, art galleries, exhibition halls and civic centers. With regard to historic background and the above mentioned cultural potential, Prague is the center of domestic as well as foreign tourism. The figures from the year 1975 show that about 5.4 million foreigners visited Prague.

Prague is also an important national and international transportation junction, having national and international airports, a dense network of railroad, several bus terminals and a less important freight terminal on the river. The highway system is not yet sufficiently developed and represents linkages with principal Czechoslovak cities.

The 4th economic sector is presented by university level schools, research institutes and facilities. The educational field comprise 11 universities. Two of these, the Charles University established in 1348 and the Czech Institute of Technology established in 1786 evolved among the first schools of such type in Europe and presently they include several schools. Other universities have specialized education programs. The total number of university students is approximately 58,000 and there are some 12,800 university employees. While basic research freedom contributes to such activities, some applied research is also focused on the social, economic and natural sciences. There are about 13,300 employees.

A substantial proportion of employment within Prague city is taken up by administrative functions at all levels. These include the federal government, the state government as well as city governments and the numerous headquarters of production and service organizations. The social structure of Prague shows in accordance with the above mentioned economic characteristics an outstanding high percentage of individuals with high school and university educations.
Average individual monthly income for Prague City is assessed at 2,700 Kes and represents a slightly higher figure than the Czechoslovak per capita income. Prague reflects an unfavorable age structure of inhabitants with a higher proportion of elderly inhabitants in comparison to the other larger cities. The environmental components of the city will be described along with the land use structure, spatial composition and prevailing environmental quality conditions.

The land use structure can be adequately described through the principle of city center organization, employment facilities, the characteristics of residential and recreational areas.

The central system of Prague can be characterized as a developing polycentric system. The principal city center which corresponds to the Prague historic urban reservation (PHUR), accounts for a substantial amount of the central facilities. The PHUR, with an area of 866 ha. (3,34 sq. miles), involves 205,000 job opportunities predominately in the 3rd and 4th economic sectors. This represents some 30% of all job opportunities in Prague city. The concentration of facilities for business, commerce, medical care, high education and governmental administration at all levels often amounts to more than 50% of the capacity for the entire city. A majority of these facilities are rated at higher and special facility grades.

Five district centers and about 15 of largest community centers complete the basic polycentric city system. The capacity of central facilities in these centers vary from 1% to 4% of the total capacity of central facilities in the city. The remainder of the total capacity is taken up by lower level centers such as less important community centers and all neighborhood centers as well as several specialized university, scientific and health centers.

In spite of a relatively high concentration of facilities in the third and fourth economic sectors, the average figures for floor space per inhabitant in Prague remain below existing state standards.

The employment facilities of the 2nd economic sector are spread densely in facilities of various sizes within the entire city area with the exception of several well developed industrial parks. These very disadvantageous allocations from the economic as well as environmental viewpoint have brought about the construction of additional industrial parks. These production centers located in outer city ring have begun to successfully develop in accordance with contemporary investment policy.
Housing is spread over the entire city territory. Residential structures are unified with various employment and recreational facilities in central areas while in other parts of the city housing constituted homogenous residential areas. Residential buildings in the PHUR date back to the 13th century. The dimensions of these buildings represent a wide range of types beginning with 2 or 3 story single family houses, formerly used by medieval merchants, and ending with 7 story residential structures built in the period between the wars. The majority of residential houses form irregularly shaped blocks. Residential areas in the inner city predominantly form regular block systems with an average building height of about 6 stories. Residential areas within the inner city are sufficiently equipped with the approximate basic as well as higher level community and social services such as facilities for business, education, health and culture. Nevertheless, open recreational facilities of adequate quality remain in short supply.

Housing in the outer city was predominantly built after the Second World War in various urban configurations. These residential areas are mainly composed of dwelling houses that are from 3 to 18 stories high. Housing projects implemented after the year 1950 have been predominantly built through the use of systems of prefabricated construction. Community and social services within new housing estates are gradually built to comply with existing qualitative and quantitative standards. In the outer city area and partly within the inner city ring several lesser residential areas composed of single, duplex, as well as family row houses were constructed.

Average inhabitant densities of residential areas vary from 190 inhabitants per acre in the inner city circle with a density of 100 inhabitants per acre in the city suburbs.

Also residential areas of outer city territories show a higher percentage of larger flats than residential areas of the inner city as depicted in the following figure:

<table>
<thead>
<tr>
<th></th>
<th>Flats having 4 rooms</th>
<th>Flats having 5 or more rooms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner city</td>
<td>15.4%</td>
<td>7.7% of the total number of dwelling units</td>
</tr>
<tr>
<td>Outer city</td>
<td>30.6%</td>
<td>13.1%</td>
</tr>
</tbody>
</table>

A majority of recreational facilities of higher and special standard levels in the sphere of cultural and sport activities is located in the downtown area and on territory adjacent to the inner city circle.
A considerable number of cultural facilities advantageously utilize historic buildings and complexes that have been converted for such purposes. Regular cultural and sport facilities that are the basic components of standard community services are spread within the whole city. However, the capacity of these facilities do not attain specified quantitative standards. (For instance the capacity of existing sports facilities is at 4.5 m² per inhabitant and doesn't correspond to the specified 20.0 m² per inhabitant).

The extensive touristic activities of Prague are made possible by its historic development as well as the organization of its various cultural events. The historic development of Prague is represented by preserved physical structures such as the PHUR and other historic complexes beyond the numerous museums and galleries. Among other cultural activities that are organized in Prague, the international art exhibitions, television festivals, international music contests and professional conferences as well as congresses can be mentioned.

In the inner city area several dozens of former historical gardens and parks of various sizes have been preserved as well as the system of radial open area wedges penetrating urbanized areas of the outer city. These open spaces usually have outstanding landscape qualities and serve for short term Prague's hinterland within a radius of about 60 miles provides a relatively high quality environment for intermediate term recreational activities. This area is widely used by Prague's inhabitants. According to the results of a recently implemented survey concerning the weekend activities of the citizens, it was found, that about 44% of the inhabitants of selected residential areas leave Prague. The destinations of these trips are recreational facilities owned by the travellers or the homes of their relatives in the country.

As the majority of large European cities, Prague shows an unbalanced relation between the number of inhabitants and the number of job opportunities within individual city units. This unfavorable situation has been caused by natural centripetal forces affecting the location of employment facilities in one or several concentrated centers as well as ineffective policy incentives for dislocations. Despite the successful development in recent years of a new policy for facility allocation, nearly 50% of job opportunities remain in the CBD and in a narrow circle adjacent to the inner city. This is an area equivalent to approximately 2000 ha or 110 sq. miles. This fact, in combination with dense urban structures within a territory of the inner city has strongly affected the existing concept underlying the transportation system. In spite of the fact that both mass transit and individual transportation have been gradually developed, the emphasis has been upon mass transit. Mass transit represents a combination of railroad, subway, streetcar and bus lines. Transportation within the agglomeration is provided by rapid transit (regional train) and in part by the bus network; whole subways, streetcar lines and buses serve the city.
The construction of the subway system was begun in 1968. It currently consists of two lines in operation with a combined length of 20km (12.5 miles). A third line measuring 6 km is nearing completion.

In 1978 about 78% of all job related trips were conducted by mass transit. Road network shows the classical radial and circular road pattern created by arterial, and local streets. The city expressway system is under construction except for several segments and intersections which are currently in use.

In spite of the construction of several multi-level parking facilities in the past and continued construction, a majority of the automobiles are parked on streets and other surface parking lots.

Individual transportation is subject to regulation within the PHUR. Only selected streets of the PHUR road network are used for regular transportation, while other streets exclusively serve service transportation and pedestrian transportation, as well as some mass transit. In city centers the existing network of pedestrian streets is enhanced.

Utility services can be briefly described in the following selected figures. Apartments are heated by various single room or multi-room heating units. Block or territorial heating facilities as well as centralized heat with individual buildings are also available. About 75% of the buildings are equipped with central heating systems. The heat is produced by the combustion of solid fuels (84%) consisting of different types of coal or processed coal products. The remaining need for heating energy is met through the burning of liquid fuels (heating oils - 5%) and natural and industrial gases (10%). Electric power for heating is used only exceptionally.

The supply and production of gas and electricity respond to current standards and demands. Electricity is predominantly produced by the combustion of solid fuels as well as oils.

The water supply covers necessary city needs. Water is obtained by the treatment of Vltava river water and from several natural and artificial water reservoirs outside of Prague city.

The liquid waste collection system is permanently expended as a result of capacity depletion of the contemporary city sewer system. The capacity of treatment facilities for liquid wastes have also been depleted. Solid waste disposal is performed by ordinary means of collection. The liquidation of solid wastes is carried out by disposal into landfills and through various processing methods.
Processing facilities utilized in Prague consist of several incinerations and the stations utilizing recycling process.

The spatial composition of the settlement is formed by the interaction of natural and man-made components. From a standpoint of natural elements, Prague's spatial composition is based on the Prague valley containing the Vltava river and supplemented by several transversal valleys. Therefore, the terrain of the city is very varied with extreme height differences of about 150 m (490 feet). Prague is situated at 280 metres above sea level. At many places, original open spaces encompassing forests, gardens and parks were protected to the present and significantly contribute to the exceptional appearance of the entire city.

The allocation of urbanized areas within the territory of existing natural zones has been very carefully managed during past as well as contemporary city development. Only a few examples can be cited to the contrary. The urbanized areas of Prague can be divided into three characteristic territories. The first, involving the area of the PHUR, represents the haphazardly and partially planned physical block structure of a well developed medieval town. This area contains buildings built up in various architectural styles since the 12th century with an average height of about 4 stories. An outstanding panorama is created by the steeples of numerous churches and cathedrals, the natural attributes of the Vltava Valley, and the imposing presence of Prague's castle.

The second territory, a wider inner city ring surrounding the principal city center, involves urbanized areas mainly built up between the middle of the 19th century and the end of the Second World War. This territory is predominantly formed of regular quid construction systems with average 6 story blocks which are varied by several dozens of low density residential areas. A majority of the buildings are built of bricks and have a plaster surface.

The outer city territory depicts post war city development. Having projects formed in various compositions of detached structural patterns represent a majority of urbanized areas. The buildings were predominantly constructed from panel components with painted concrete surfaces. Structural height varies from 3 to 20 stories while a majority of buildings have heights of between 7 and 9 floors. The urban design of these residential areas as well as employment facilities has respected the valuable natural attributes particular to this territory.
The wide spectrum of environmental conditions will be narrowed to selected items for the purposes of this general description. Air quality logs behind the level of optimal air standards in several regions of Prague City. This is a result of a high proportion of solid fuels and lesser quality oils used for heat and electricity production as well as an unfavorable terrain configuration and adverse climate (wind) conditions. The environmental quality of Prague's streams such as Vltava river and it's tributaries is also unsatisfactory. This is a natural consequence of inadequate waste water treatment in industrial facilities and settlements located up stream on the Vltava river. The level of solid particles in the air also exceed allowable standards in several areas of the city.

The physical protection of Vltava river banks and tributaries against flood hazards is sufficient in all areas with the exception of several short and unimportant segments.

Noise pollution exceed in many cases noise levels determined by the state. Existing noise standards are relatively representing for purely residential areas maximum noise pollution level of 55 dB and for mixed residential areas a level of 65 dB.

Physical conditions in built up areas show various construction characteristics. While the historic city center and the adjacent ring of the inner city deserve higher attention current maintenance, reconstruction or renewal efforts, the quality of remaining structures in the city is relatively acceptable. The contemporary physical state of the PHUR has been brought about the enormous capital investment for complex revitalization on the one hand and the necessity for the construction of new residential suburbs following the Second World War on the other hand.

Exceptional qualities in man-made structures as well as natural elements are subject to state protection. Several hundreds of historic monuments and complexes as well as several natural (wild life) reservation within Prague's territory are protected by the state. In the year 1972, the old city of Prague has been decreed a historic urban reservation. The area of the PHUR which is one of the largest and most important urban reservations in Europe contains a preserved individual layout scheme with 1322 historic buildings and complexes conserved for various social reasons. The PHUR represents more than 1000 years in the physical development of the city and is a subequal component of the comprehensive development of European civilization.
2.3 The Historic Development of Prague City in Brief

According to historic written sources Prague was established in the 9th century as a fortified settlement by Slavic princes. It consisted of a wooden temple, farm houses and the homes of merchants. At the beginning of the 10th century, Prague became a seat of Czech kings and first sacral constructions in stone emerged. In the middle of the 11th century the Old Town of Prague was built in early medieval romanesque style and gradually developed for the following two centuries. This town was formed of wooden and houses. In 1234 the substantially redeveloped Old Town of Prague was surrounded by a bulwark. In 1257 and 1320 two new historic Prague townships were established - The Lesser Prague Town and the Hradec Town that were attached to the south and southwestern walls of Prague's castle. In the 14th century and during the reign of Charles the 4th, King of Bohemia and Germany, Prague undertook some ambitiously planned physical development. The New Town of Prague became an extraordinary example of gothic city planning in Europe. The fortified City of Prague consisted of 2 castles and 4 towns and had according to written record approximately 50,000 inhabitants living in an area of 1940 acres. Prague shared with Venice and Paris the unofficial designation of the largest city as well as political and cultural center of medieval Europe.

The period between the 15th and 18th centuries was an era of stagnation from a viewpoint of the territorial development of the city. Prague is constructed within the boundaries of the former gothic city.

The baroque era of the 17th century was an important period for Prague's redevelopment and outstandingly enriched the image of the city.

The foundation of Karlin as a suburb in the classicist style marked the beginning of new suburban development spurred by rapidly advancing industrialization and growing urbanization.

Within the period 1880-1901 Prague incorporated the territory of several currently growing suburbs and expanded it's total area to 5250 acres. In 1921 the "Great Prague City" was created by an annexation of 37 additional communities and the gradual territorial expansion of Prague continued, reaching a total area of 52,863 acres. The continuous and dynamic physical development of Prague brought about further administrative expansion to a total area of 116 square miles through the incorporation of 21 additional communities in the second half of 60.
In 1974, during the elaboration of the latest city master plan, the government of the Czech Republic approved the additional expansion of Prague's administrative territory to the present day area of 193 square miles.

The growth of the number of Prague's inhabitants is shown in the following figures:

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1400</td>
<td>50,000</td>
</tr>
<tr>
<td>1600</td>
<td>60,000</td>
</tr>
<tr>
<td>1700</td>
<td>40,000</td>
</tr>
<tr>
<td>1800</td>
<td>75,000</td>
</tr>
<tr>
<td>1900</td>
<td>514,000</td>
</tr>
<tr>
<td>1930</td>
<td>848,000</td>
</tr>
<tr>
<td>1950</td>
<td>933,000</td>
</tr>
<tr>
<td>1970</td>
<td>1,143,000</td>
</tr>
</tbody>
</table>
3. The physical planning of Prague city

3.1 The organization of physical planning process

The Department of the Chief Architect for the capital city of Prague (Prague City Planning Office) is an autonomous institution of the Prague City National Committee. The Department of the Chief Architect for the capital city of Prague (DCACP) is fully responsible for physical planning for Prague city and it shares with the Central Bohemian (Regional) National Committee the responsibility for the physical development of the Prague agglomeration. The city planning office cooperates with other departments and offices of the Prague City National Committee (PCNC) such as the Department of Construction, the Department of City and Regional Planning and the Department of Social Relations as well as relevant institutions and offices at the state and federal levels on various tasks concerning the comprehensive physical development of Prague. The PCNC subordinate to the government of the Czech republic. In the field of physical planning the Ministry for Technology determines the principles for the formation and the protection of the housing environment as well as the assurance of a high architectural and aesthetic levels in building and in physical planning.

The DCACP elaborates physical planning documentation of itself - in the case of the most important plans - or orders and directs the elaboration of appropriate planning documents at specialized planning and projecting institutes. The approval and adoption processes of selected physical plans are organized by the DCACP and the adoption is performed by the Council of the PCNC. The city master plan as a most important physical plan for comprehensive development is finally adopted by the government of the Czech republic.

City physical planning documents can involve specialized tasks such as transportation planning, utility service and environmental planning or can be composed of comprehensive physical approaches. Comprehensive physical plans involve the division of certain areas in the spheres of economy, social aspects and environmental as well as individual physical fields. Comprehensive physical plans are differentiated by purpose and liability, in accordance with the size of the territory that has been divided and the time span that is involved. Physical plans are divided according to purpose and liability into
the following categories:
- territorial prognoses
- territorial plans
- territorial projects

Territorial prognoses predominantly stipulate the basic demands of territories that are to be met in long term periods. Prognoses are developed for alternate solutions. Prognoses need not to be approved and, therefore are not usually bidding for subsequent planning purposes.

Territorial plans usually concern medium-range developments having close relation to economic, social as well as environmental aspects and representing more precisely specified goals and policies. These physical plans have to be approved by municipal authorities and in special cases by the government of the republic. In this context, the city master plan can be mentioned as specific kind of territorial plan.

The functions of the territorial projects consist of stipulation of planning conditions for the conduct of area specific and time programmed construction in the next 3 to 10 years. The projects have to be elaborated on the basis of actual investment program and are contingent on the approval of municipal and local councils.

Plans are divided as follows on the basis of the territorial area that they address:
- plans for large territorial units
- plans for medium size territorial units
- plans for community units

These three principal plans usually apply to the territorial subdivisions and time frames depicted in the following chart:
Consequently, it is often the case that those prognoses, plans and projects do not correspond in form to the theoretical descriptions mentioned above. Two principal and comprehensive physical plans for the city of Prague have been elaborated during the last five years. In 1976 the Master Plan of Prague City was adopted and in 1980 the first draft (preliminary proposal of the Territorial Programs for the Prague Historic Urban Reservation was finished and discussed within relevant departments of the PCNC.

3.2 Brief Description of the Master Plans for the City of Prague

The physical development of Prague's city was directed in the past through several approved City Master Plans. The first draft of the comprehensive master plan was prepared in 1998 within one year by an avant-garde of Czech architects and city planners. The permanent planning process of Prague's development started three years later and led to the adoption of the first regular master plan in 1969. A year later, the city master plan was completed by a long range development study for the entire Prague agglomeration. This study has created a sufficient base for optimal progress in the city's future physical development as well as any desired administrative extensions of the city territory. In 1968 the revision of the 1969 master plan was completed. He reflected new conditions for possible physical development within the territory of Prague agglomeration.

As said earlier, the latest master plan for Prague city and the master plan for Prague's agglomeration were completed in 1976. Both master plans address Prague's development until the year 2010 with an initial phase ending in 1990. In this plan these strategic problems of comprehensive urban development were considered and approached in details within the following spheres:

In the economic sphere:
- the economic position of Prague in relation to the state, the Central Bohemian region as well as the agglomeration,
- the development in Prague's economic structure as specified in individual economic sectors,
- capital investment for general development involving city and state demands on the basis of available capital,
- economic aspects revised by the standard of living,
In socio-demographic spheres:
- the socio-cultural role of the city in the context of the state,
  the region as well as agglomeration
- city demographic structure as it pertains to natural growth as well
  as migration
- social structure and trends in social behavior,
- citizens life styles,
- specific social programs in housing, renewal, transportation and other
  fields,

In the environmental and physical spheres:
- the statement of environmental regulations and standards; trends in
  the "environmental behavior" of citizens,
- city physical development and the position of the city within Prague's
  agglomeration, and the settlement network of Czechoslovakia,
- the concept of the physical structure of the city:
  - the central city system and land use patterns (functional
    distribution)
  - the structure of spatial composition
  - the technical infrastructure encompassing transportation and
    utility services
- stipulation of development and redevelopment areas as well as
  specifications of successive procedures in building,
- the deliniation and specification of measures for protected territories,
  in the administrative sphere:
- the organization of redevelopment and development processes,
- specification of administrative as well as legislative instruments
  for the implementation of design objectives

During the elaboration of Master plan, emphasis was placed on the
insuring of appropriate flexibility and universality for the plan
as an answer to potential unpredictable conditions that could appear in the
course of long-term development.

The physical content of the city master plan consists of verbal and
graphic parts. The verbal part includes a detailed descriptive report with
extensive data and figures explaining the problems in question. The descriptive
report is followed by an abstract of development objectives and policies called
Development guidelines which are compulsory for any activity related to city
physical development.
The graphic part involves three principal maps for development to the year 2010 on a scale of 1:10,000. The first map depicts land use, the transportation network as well as designed development and redevelopment areas. The second map is an illustration of spatial composition with protected urban and natural reservations while the third plan is devoted to design of utility services and environmental factors. This set of principal maps is supplemented by several dozen supporting maps and schemes at a scale of 1:25,000.

Less than two years later the city master plan was integrated with the general plan for the development of Prague. This document has been adopted and concerns physical development in precisely specified terms for a five year period beginning in 1980.

In accordance with previous experience, the validity of this master plan is estimated at 8-12 years from the time of adoption.
3.3 An elaboration of the test Master Plan for Prague

The Master Plan for the City of Prague from the year 1976 was elaborated on the basis of an integrated city model. Although this model was elaborated with the Master Plan in mind for purposes of improving efficiency and reducing implementation time, it is also applicable to other types of physical planning documents. Upon completion this interdisciplinary model will be almost fully automated and computerized. The city model as well, will be interconnected with corresponding development models and systems at the state and federal levels. It is assumed that the model will be continuously upgraded. Presently, this model is still being developed and existing phases of this development system are in current use as well as at the stage of experimental operation.

The model is basically founded in the general process of physical development in Czechoslovak settlements that can be schematically depicted as follows:

![Diagram of the Master Plan process](image)
Only the first two steps will be discussed in this paper.

The model for the city's physical planning consists of two parts - one analytical and the other synoptic (analytical). The model is depicted on the opposite page and has been compacted for the purposes of this study. The analytical part contains 5 phases and 4 are treated within the scope of the data base.

Phase 1 encompasses the collection, up-dating and ranking process as well as other data manipulation. Data are obtained from various sources such as the Bureau of Czechoslovak Census, the state information system, various types of surveys, urban plans and projects that have been approved or adopted as well as all building implementations. The data base contains past, contemporary and projected information on qualitative and quantitative levels in the city's economic, social, environmental and physical fields. For elaboration of master plans the data is usually grouped into individual census tracts (Prague City has 520 census tracts).

In phase 2 various types of data analysis can be performed. One of the goals of this phase is the determination of the contemporary qualitative and quantitative potential for the city in individual variables within the data base. Within this phase, the weighing of variables for relative importance (one of the most important processes in this interdisciplinary model) is also conducted. The weighing is carried out at various levels beginning by the weighing of variable systems, through individual subsystems and ending with the weighing of selected variable groups in individual census tracts. For instance, the economic, social and environmental systems of the model are weighed at first and this is followed by a weighing of individual variable groups such as eco-biological, aesthetic-psychological and land use factors. Finally a weighing of individual variables such as housing, social services, institutional facilities, industry, recreational facilities, transportation and utility services is undertaken. Evidently this special parametric process is performed by a group of decision makers and the resulting decisions are placed within data banks. Specialists from all fields related to comprehensive urban development are represented in the weighing committee. Variables having economic bases are also assessed on monetary principles but the usefulness of such an assessment is restricted to the economic sphere.
The City Development Model

6 Synthetic Phase

12 A Development of Detailed Urban Design Systems
14 B Preliminary Urban Design
13 C Specific Urban Design

Plan Approval

Elaboration of Detailed Physical Plans

Project Approval

Elaboration of Urban & Architectural Projects

Building Registration

Implement Process

11 A Development of Urban Design Systems

6 C Specification of Development Principles
7 B Elaboration of Development Alternatives
8 B Evaluation of Development Alternatives
9 B Detailed Elaboration of Selected Plan

15 C Detailed Elaboration of Plan Impact

16 B Specification of Development Principles
17 C Elaboration of Development Alternatives
18 B Evaluation of Development Alternatives
19 C Detailed Elaboration of Selected Plan

20 C Adoption of Plan

World Development Trends

A - Phases that are entirely or almost fully computerized
B - Partially computerized phases
C - Marginally computerized or non-computerized phases
Among other activities at this stage we may site data selection for certain programs. Should the needed information be unavailable or outdated in the case of certain programs, a specific order for updating such data is prescribed.

Phase 3 represents the assessment of relative and absolute values of individual or grouped variables over a certain projected period. Qualitative and quantitative measurements to be used in the prospective assessment of data pertaining to individual variables, their groups, sub-system and systems are originally generated from data provided for the long-range developmental aspects of the Federal Development Plan. These can be modified to a certain extent and supplemented by additional measurements that are closely related to the current qualitative and quantitative trends within the city. The resulting measurements become tools for assessment and are located within a technical manual entitles "The Territorial and Technical Principles for the Development of the City". This document has been approved within the scope of phase 20.

In the first, the analysis takes place at the level of the added value resulting from the use of labor input or from natural expansion within a determined period. As an example we can mention the relative growth of land values in locations where the stations of the new mass transit line are to be developed or the increasing value of regularly mentioned city parks. The second assessment is derived from socio-economic relations that result from projected scenarios involving social demands on one hand and economic, technical and environmental implementation possibilities on the other hand. The increase in the relative value of farm land as the result of growing social demand for food products and the worldwide climb in food prices could serve as an example. The assessment is treated through economic and relative weighing method based on joint indexing techniques. This weighing procedure is widely used in comprehensive, multidisciplinary approaches.

The activities as well as processed data within this phase regressively influence phase 19 pertaining to the evaluation of alternative solutions of city development plan.

Process within the scope of phase 4 introduces the final step in the analytical sphere of this model for comprehensive development. The assessment of the degree to which each city area unit may provide conditions and or
opportunities for future growth is treated in this section. The principal factors detailing these opportunities are assessed by the variable for developmental instability. These factors include economic, partially social and mainly environmental values such as appearance, amenity, land use, transportation, physically and climatically related values (see below: the description of model components). The output depicts area feasibility and site selection for optimal future redevelopment and development of the city. These can be obtained in various forms according to individual needs. The forms include screen display as well as documents that provide maps, charts and t. The results can be provided in individual and grouped variables as well as in overall development suitability variables for individual area units.

Phase 5 involves the elaboration of various types of required surveys, supporting studies as well as the development of analytical and assessment techniques. The processed information is then included into the information system.

The synthesis of the model encompasses planning and physical planning streams (processes). The physical planning stream includes 10 basic phases.

Phase 6 is a core stage of this synthetic where the entire concept is developed. The defining of the tasks, the formulation of the methodology of the synoptic process as well as the conceptual and optimizing principles and techniques are discussed, developed and selected in accordance to individual physical planning purposes. Conceptual principles encompass the statement of physical planning objectives and the formulation of general policies. The utility of the computer at this stage is still very limited and represents only the selection of appropriate standard information covering regular conceptual approaches can be enriched by data obtained from step 20 (the adoption of city planning documents) as well as from the National Development Plan.

Phase 7 includes the elaboration of alternate solutions for the re-development and development of the city in accordance with planned development principles. A set of solutions is based on the following conceptual approaches: territorial development covering only areas in which redevelopment and
development are feasible (step 4 - feasibility assessment). Unless all general objectives for city development can be fully achieved by any alternative the following conceptual approach is undertaken,
- territorial development ensuring planned city development regardless the availability of areas in which development is feasible,
- territorial development representing a compromise solution between the above mentioned alternatives.

By the specification of principal conditions for the construction of re-development and development areas, as recommended in phase 4, physical planning systems (or urban design models) were especially developed for Prague City. These structural physical planning systems can be divided into specific and complex urban design models. The specific models are usually utilized for proposals involving individual components such as the organization of the city's central system, the transportation network or the utility service structures. These models are predominantly based on various modifications of locations theory and PERT theory and are predominantly used for redevelopment processes in existing urbanized areas. Complex models of structural physical planning were developed for the formation of new city development on the basis of optimal social, environmental and economic parameters in comprehensive settlement units. These models consist of fully equipped settlement nuclei (elements) and urban assembly systems such as linear, grid network or satellite patterns. For the purposes of the Master Plan these urban design systems vary in organization of land use structure, transportation and utility service patterns as well as in composition involving the height of structures, layout systems and densities. Should any of these computerized systems not fit specified territorial conditions, then such areas are projected by classical methods of individual design applied by a team of urban specialists.

Phase 8 represent an evaluation of alternate drafts, the selection of the optimal solution and it's preliminary approval. For the evaluation process various methods such as a modified cost - benefit analysis, an input-output analysis as well as a comprehensive analysis based on the relative weighing of individual elements of preliminary plans are used. Evaluation
methods for economic aspects of the drafts are generally computerized. However, the principal emphasis for alternative evaluation is placed on a comprehensive relative weighing analysis which takes into account economic factors as well as social, aesthetic, historic and environmental issues. In this evaluation method point or index weighing techniques are utilized. This process is implemented by the weighing committee on the same principles described in phases 3 and 4.

After the alternatives have been evaluated and discussed by appropriate municipal authorities an optional solution is finally selected for adoption. Selected preliminary drafts of plans are discussed by all organizations concerned with or entitled to comment on proposals. The City Planning Council considers all admonitions and on this ground prepares the direction for the completion of final plans.

Within stage 9 or with the assistance of processes treated in stage 7, a selected plan is modified and developed in appropriate detail under specified directives for plan completion.

In phase 14 selected redevelopment and development areas of the draft are projected in detail. This is elaborated with the assistance of phases 12 and 13.

Phase 12 involves an elaboration of detailed urban design models, that are developed on the principles stated in step 11 - the development of urban design systems. These comprehensive models are designed in detail from viewpoints including land use, spatial composition, environmental as well as construction. As required by step 8, then alternate models are computerized and used in the design of areas in which development has been problematic. This process is not yet developed in sufficient quality. Therefore this phase is considered as an auxiliary process and a majority of problematic areas are finally projected by a team of urban specialists using classical method of urban design. This conventional process is treated within the scope of phase 13. Outprints of phases 7, 9, 12, 13 and 14 are predominantly provided in graphic forms which include maps and screen displays as well as charts.

Phase 15 represents a more detailed revision and elaboration of the social, technical, economic and environmental impact of proposed city development then was initially projected in step 7. Some influences are studied in concrete or
simulated conditions using physical modeling methods. In the final phase (10) physical planning document elaborated to required details is adopted by relevant municipal and in some exceptional cases by authorities of the Republic. At that time approved material becomes a compulsory document for relevant physical activities within city territory.

Steps 16 to 20 express a city planning flow chart that is considered as an integral component of comprehensive physical planning.

Within step 16 comprehensive development principles of the city are elaborated on the basis of two planning materials. The first is a draft proposal for city development prepared to reflect interests at the city level while the second involves city development objectives derived from the National plan for development. The proposal of prospective city development as viewed by the city is established at phases 2 and 3 (data analysis and data assessment) and contains the demands of the city for optimal development in the economic, social, cultural and environmental spheres. The tasks assigned to the city contain principles of complex city development from the state's viewpoint and are obligatory, as they follow from concrete conditions and possibilities within city.

Phase 17 includes the elaboration of planning alternatives based on development principles stated in the previous step. The evaluation of alternatives, discussion upon alternatives and the selection of an optimal solution as well as the preliminary approval of such a solution are activities involved in step 18. These processes are similar to those described in phase 8 involving evaluation of physical planning alternatives. At step 19, selected policy draft is adopted and elaborated in specific details with some assistance from processes found in phase 17. At final step of the planning process - phase 20 - the adoption of the planning document takes place and the document becomes a compulsory guide line for the elaboration of subsequent physical planning materials.

This comprehensive physical planning model for Prague's City consists of three distinct, interdependent models described below:

- the economic-technological model
- the socio-demographic model and,
- the complex environmental model
All individual models have been substantially simplified to permit their utilization within the sophisticated and comprehensive model of the city. Therefore all single models encompass only substantial information and selected processes that participate in the concept of overall city development.

The economic-technical model consists of two submodels. The first is the macroeconomic submodel dealing with the inherit economic base of the city. This submodel is divided into individual economic sectors. The second submodel, or the city operational submodel focuses upon the economic factors of city management, transportation and utility services as well as upon the construction and reconstruction of the city.

The socio-demographic model is formed of three submodels. The demographic submodel considers city population development and basic population characteristics such as age and family size structures. The social submodel concerns the lifestyle of city inhabitants, standards of living (including income structure) and education levels that influence social characteristics as well as the outlook of city social behavior. The physical implementation of state and local social programs in selected fields such as housing, education, working condition, medical care, recreation and culture is treated within the scope of the third submodel.

The environmental model is the most complex model and is still being developed. Currently, this model consists of the eco-biological, aesthetic-psychological, land use and technical submodels. The eco-biological submodel addresses the ecological balance and optimal environmental condition for city goers. In this submodel various environmental elements such as individual natural components, noise pollution, natural and man-made hazards, health conditions of inhabitants and other factors proceeded.

The aesthetic-psychological submodel is created on spatial composition factors, cultural aspects of physical structures and the elements forming the social-psychological image of the city. Spatial composition is studied in relation between natural and man-made components, in relation between individual man-made component as well as between natural components themselves from a standpoint of legibility, diversity, accessibility, congruence and other aspects.
The conservation and proper utilization of the cultural heritage of physical structures protected for historic, aesthetic as well as technical reasons is pursued in the cultural sphere of this submodel. The third region, or the so called "psycho-social atmosphere" of the city deals with factors that affect users of the city from the standpoint of comfort, convenience, vitality, enjoyment, pleasure and meaning.

The submodel for land use has been developed with the emphases on activity location and land use relations, qualitative and quantitative aspects of functional facilities as well as transportation and utility services.

The last, or the technical submodel concerns physical conditions and various processes of maintenance and revitalization of physical structures as well as the continued physical development of the city.

Each of these models and submodels is developed in accordance with basic, well known system theory involving elements and linkages. Each model and submodel includes two main streams of design - the physical planning process (or developing model process) and the planning process (or program formulating process).

Each model and submodel is divided into two principal phases consisting of analytical and synthetic parts. The analytical process consists of analysis and assessment of information with outputs that specify needs, determinants and possibilities. The synthetic or projection process involves, in brief, the following phases: the specification of objectives, methodology formulation, the elaboration of alternatives, alternative optimization, policy specification and the definition of imperatives.
4. Principal general objectives for the comprehensive development of Prague

Principal development objectives for Prague are based on generally recognized principles of complex development in Czechoslovak settlement units and systems. These are founded on mutually balanced linkages between three fundamental factors:

- the economic organization of settlements - focusing primarily on the efficient management, operation and physical development of settlement units - with the purpose of their prospective development,

- the optimal environmental conditions\(^1\) - ensuring the harmonious coexistent development of society and its artificial production on one hand and the natural evolution on the other hand,

- the implementation of demographic goals and determined social as well as cultural objectives and policies\(^2\) - within the competence of urban planning and the physical development of settlements. These contribute to the ensuring of continued desirable development in life style and to the growth of standard of living for all inhabitants.

Specific objectives of long-term planning for Prague are derived from the interaction of the following elements:

- contemporary and perspective demands for Prague's development,
- development determinants stemming from conditions specific to Prague,
- contemporary and targeted economic and financial resources available,
- goals which are determined and specified for Prague in higher echelon documents at the republic or federal levels.
In keeping with the above mentioned general goals the following peripheral objectives for the future of Prague's development were stated:

(Objectives in the economic sphere)

- To develop Prague city (as well as Prague's agglomeration) as a capital of the federal state - as the governmental, administrative, residential, scientific, commercial and business, cultural and transporation center of Czechoslovakia.

- To increase the number of job opportunities to a total of 725,000 in 1990 and 770,000 in 2010.

The structure of job opportunities that is derived from the position of Prague in the State Development Plan as well as from Local Development Plan will reflect an increase of job opportunities freedom mostly in the 4th and 3rd economic sectors as well as in selected traditional fields of the second economic sector involved in the production of sophisticated and advanced technology.

The basic development trend specifying the changes in the number of working opportunities can be expressed through a comparison to contemporary figures deemed to be equal to 1:

2nd Sector: 3rd Sector:

| Manufacturing | ≤1 | wholesale and retail | >1 |
| Construction | ≥1 | services | ≥1 |
| Energy production | ≤1 | culture | =1 |
| Industry | | physical activities | ≥1 |

4th Sector:

| Education | ≥1 |
| Research | ≥1 |
- To promote the proportional economic specialization of particular city areas as dictated by specific area conditions and possibilities,

(Objectives in the social and demographic spheres)

- To ensure a proportional growth of the city so as to not exceed 1,270,000 inhabitants (Prague agglomeration 1,890,000 inhabitants) in 1990 and 1,390,000 inhabitants (Prague agglomeration 2,150,000 inhabitants) in 2010. This objective results from contemporary realities in the state settlement of a hern. Contemporary Czechoslovak urban structure represents dense settlement networks mirroring the historic urbanization of the country. The average theoretical settlement density of the CSSR shows 4.18 sq. miles per settlement unit and 34.78 sq. miles per settlement unit having 2,000 and more inhabitants (data from 1978).

The principles of Czechoslovak urban development policy in the face of this unfavorable situation in settlement structures can be briefly characterized as follows:

- the development of settlement systems that will reflect specific economic, social, environmental and physical conditions and possibilities for units with the respect to relatively balanced settlement patterns within the whole country,
- the gradual reduction in the density of settlement units,
- the development of urban structures within evolving settlements to the extent possible.

- To gradually ensure respectable qualitative and quantitative conditions in housing, education, work and recreation for all inhabitants as well as to the city in accordance to projected standards of the republic or local level,
- To ensure a balanced social structure of city inhabitants as a substantial factor for the prospective development of the city,
- To create specific urban conditions attracting a young and professionally qualified population,
  This is in view of the higher percentage rate of the elderly in the population (mainly retired people) in comparison with corresponding figures in other larger Czechoslovakian cities,

(Objectives in the physical sphere)
- To develop Prague city as an intellectual and physical "core city" of Prague's agglomeration
  Although the lack of congruence between the physical area represented by Prague's agglomeration and its core area remains unresolved, this is only secondary to the achievement of the above mentioned objective.
- To develop the city (as well as the agglomeration) as a self-sufficient urban organism with a reasonable surplus in facilities for business as well as recreational and cultural resources to meet demand in related, affected areas.
  A self-sufficient urban organism is one in which job opportunities as well as the quality and quantity of business, service and recreational facilities are sufficient in number to meet reasonable basic demands by the population. The principle of the self-sufficient area is also to be applied to the city urban units - districts, communities and neighborhoods. The application of this principle will make possible the reduction of physical distances between principal human activities. This will shorten work trips, recreational trips as well as shopping and service trips.
- To create the city as a proportionally compact (dense) urban unit within a framework of optimal environmental conditions, contributing substantially to the reduction of functional linkages as well as reducing energy consumption.

This goal promotes the formation of build up areas with higher employment and residential densities and is primarily concerned with areas under development and areas scheduled for renewal. This goal reflects current and future Czechoslovak urban development policy based on new legislation protecting quality from land against alteration for various urban purposes. This legislation was adopted by federal authorities in 1977 and was in response to the previous level of per capital agricultural land in Czechoslovakia (0.48 ha/capita). The lowest acceptable economic rate of farm land is considered to be between 0.8-0.9 ha/capita.

- To adopt the renewal, reconstruction and maintenance processes as integral and continuous components of the comprehensive development of the city,

- To develop a city central system within the framework of existing conditions as a balanced system that is regularly laid out, hierarchical as well as policentric and that will inherit the dominant portion of a powerful city center - as outlined by the Prague historic urban reservation.

The elements of this central system will ensure a sufficient quality and quantity of employment facilities within the determined areas being served. The implementation of this objective will help to relocate the job opportunities that are at the present time primarily concentrated in the CBD area to other city centers which are spread out within the entirety of the city's territory.
- To create an integrated transportation system based on partnership between mass transit and individual transportation as well as freight transportation, making accessible to all inhabitants, working people and visitors a great degree of mobility within the city area as well as making possible efficient distribution of commodities,

- To ensure an adequate distribution of utility services such as energy for heat, electric power, gas, water, and communications on one hand and the removal of solid and liquid wastes through appropriate treatment and disposal facilities on the other,

(Objectives in the environmental and cultural spheres)

- To protect and properly utilize the physical historic heritage which is represented by former city development as a unique and specific factor within the earlier future identity of the city,

. This means that the Prague historic urban reservation (PHUR) as well as other significant historic complexes spread out within the city area must permit as vital elements of social and physical activities,

- To create respectable environmental conditions for living, working and recreation by all inhabitants, working people as well as visitors,

- To strictly protect and enhance the physical components that are exceptional as well as natural such as ground, water areas and streams, parks and forests, natural reservations for flora and fauna that form together with man-made structures the spatial outlook of the city,

. This goal ensures the performance of fundamental spatial and land use analyses of importance elements that make up the physical composition of the city. Technical utilization of these elements through functional feasibility and feasibility in construction with specificity as to the type
and height of structures will contribute to desirable spatial composition. To ensure an acceptable quality of air, water areas and streams, clear surface and underground spaces, the reduction of noise levels, the formation of a relevant quality and quantity of biological components and the mini-
mazation of possible natural and technical hazards.

Despite clearly stated optimal environmental quality standards, in some cases such as the reduction of noise levels it will be impossible to achieve the required norms. In such cases, individual noise standards that are specific to different forms of land use are presented for particular areas of the city.

Following an enumeration of selected development goals, I at first intended to conduct a comparison between all aspects pertinent to physical planning in the two cities. There are however certain conceptual gaps within available planning documents as the result of slight diversities separating the planning approaches in the two cities. When combined with an obvious similarities in objectives, these necessitate that we restrict the forms of our study to comparison of land use goals.

These will be divided into five principal categories:

- industrial facilities
- centers and social facilities
- housing
- transportation
- utility services

Objectives pertaining to industrial facilities:
- To favorably develop existing facilities in future oriented industrial fields and to establish new manufacturing fields only when these are directly connected with the needs of the city.
The contemporary industrial structure of Prague city represents a wide spectrum of various manufacturing facilities. This objective reflects a planned economic development of the whole country towards proportional specialization and adequate equilibrium within the industrial potential of settlement networks. Therefore, selected industrial fields will be developed and redeveloped fundamentally on the basis of intensive (technological) development in Prague.

- To gradually concentrate selected industrial facilities into industrial parks,

- It is projected that about 70% (1200 ha) of the required industrial areas will be concentrated in industrial parks. These industrial parks that benefit from extensive space are created in the entire city, to the exclusion of the CBD area. These are equipped with corresponding supporting facilities and structures such as energy and water supply, waste removal and treatment plants as well as appropriate freight and personnel transportation facilities. The different quality and capacity of related supporting facilities within industrial parks will ensure desirable specialization in the economic structure of the city. The only industrial facilities having non polluting production processes from an environmental viewpoint and having the possibility of expansion to an optimal size will remain at existing locations.

Objectives for city centers (including employment facilities in the 3rd and 4th economic sectors) and social services:

- To develop a hierarchically organized network of city centers that are equipped with social services and institutional facilities of appropriate quality and quantity,
- To enhance the further development of district and regional centers and to reduce at the same time the excessive concentration of job opportunities within the CBD.

As proposed, Prague's central system consists of a principal city center containing the Prague historical urban reservation (PHUR) with linear centers growing from it and 5 district as well as regional centers. In addition about 30 community centers and several dozens of neighborhood centers should also be mentioned. The capacity and qualitative level of particular city centers is derived from valid or proposed standards for social facilities and from the number of inhabitants served. Social facility standards are graduated at the levels of basic, higher or special standards. Basic standards express optimal basic needs of inhabitants of neighborhoods, higher social service standards relate to the needs of larger urban residential units such as communities and districts and special standards express optimal needs of inhabitants and visitors at the city level.

Standards are specified at individual qualitative levels for the following facilities:

- educational facilities
- health facilities
- business and commercial facilities
- services
- recreational facilities
- accommodation
- To preferentially develop centers of low grade level within neighborhoods and communities that are under construction or renovation,
- To complete central facilities in recently built or renovated areas,

(Objectives for business, commercial and service facilities)
- To promote the expansion of basic commercial and service facilities through new construction as well as renovation and reconstruction of existing facilities in city areas that are insufficiently equipped,
- To gradually complete commercial and service facilities of higher standards in principal city centers,
- To preferentially locate business and service facilities of special standards such as fashion good shops and international restaurants in the PHUR area and ultimately to other main centers,

(Objectives concerning educational facilities);
- To equip every residential area with nursery schools of adequate capacity,
- To build new facilities or modernize existing facilities in conformity with specific local as well as city needs, the development of the school system and innovation in educational methods,

. Currently particular attention is devoted to the development of new types of 4 and 5 year special secondary schools providing the combined theoretical education of vocational technical schools, as well as the practical learning of apprentice schools,
- To gradually equip all elementary as well as secondary schools with related recreational facilities such as sports facilities, clubs and civic centers for students.
- To complete secondary schools and university levels with an adequate capacity of dormitory space,
- To locate new apprentice and vocational schools (technical high schools) as well as new university schools near corresponding production, service or research facilities and institutions, thus ensuring mutually advantageous cooperation.

This objective began to be implemented several years ago. The schools formerly located in the inner city are and will be fundamentally relocated in suburbs with the possibility of area development in the future. In inner city areas only secondary and higher level schools benefiting from the relationship with city center activities will be redeveloped and developed. These will consist of business and commercial schools, schools of various social service disciplines, schools of fine and applied arts as well as other schools.

- To maintain the current number of schools at the university level,

This goal reflects the newest federal thinking in the area of university location permitting balanced university development in close relation to the number of inhabitants and the economic specialization of particular Czechoslovak cities

(Goals involving health facilities):

- To gradually complete the network of health facilities and to generally develop appropriate health facilities in those residential areas that are being constructed or reconstructed,

- To modernize existing facilities of all types and grades in a way complying with prospective qualitative and quantitative norms as well as reflecting the state of the art in new treatment methods and techniques.

- To complete the development of the Charles University Health Center and to supplement it with appropriate research facilities,
Two alternate ideas have been proposed for this top grade health care complex. The first alternative consists of the current location at which many existing buildings can be utilized advantageously in the future, while area for further projected expansion is located. The second alternative, involving the construction of a new health center in the suburbs is enormously pretentious from the viewpoint of capital investment. The final decision about a location has not been yet made.

- To complete a network of kindergartens

The fulfillment of this objective is very important task in view of the high percentage of employment for women in the CSSR

(Objectives involving recreational facilities):

- To distribute recreational facilities and parks equitably throughout the city,
- To give priority to the development as well as redevelopment of all types of recreational facilities serving to the participating recreational needs of of individuals in the physical and intellectual sense,
- To ensure the completion of basic recreational facilities in housing projects that are being built,
- To maintain all historic buildings as well as urban and natural reservations,
- To complete the interconnected system of open spaces,

The proposed system of open spaces in the city encompasses the partially interconnected set of historic as well as newly created gardens, parks and other open spaces in inner city territory. These are completed by protected open spaces with natural landscapes more or less radiating from the city center. Radial open spaces that join the hinterlands of the city's landscape
with a centrally located cluster of inner city gardens provide short and intermediate term recreation of a high quality to the inhabitants as well as visitors of the city.

This will increase the average area of recreational open space from the present figure of 50 m² per inhabitant to 65 m² per inhabitant in the year 2010. Park space per inhabitant will increase from 7.2 m² in 1970 to 9.4 m² in the year 2010.

- To preserve park lands against the conversion for other uses within the city,

- To develop the open spaces and recreational potential of embankments,

(Objectives pertaining to accommodation):

- To promote the construction of all types of temporary housing such as hotels and motels as well as the conversion of appropriate historic buildings and complexes for this purpose,

- To increase the capacity of accommodation facilities to at least 90,000 beds by the year 2010,

  This goal represents more than a 150% increase in over the current accommodation. The majority of newly acquired beds will be located within the inner city area.

(Objectives concerning housing):

- To permanently raise qualitative as well as quantitative standards in housing,

  It is assumed that dwelling space will reach 28-30 sq. meters per inhabitant by 1990. Contemporary figures for the Prague are at 20-22 m² per inhabitant
- To construct at least 36,000 new dwelling units within the time period represented by each 5 year plan,
- To reconstruct after the year 1990 at least 20,000 dwelling units in existing residential areas within time period represented by 5 year plan,
- To obtain after the year 1990 at least 10% of the total amount of new dwelling units from areas renewed within time period represented by 5 year plan,
- To achieve a 3% surplus in dwelling units by the year 2010,

This goal will make it possible for all city inhabitants to select a residence located in an area that is compatible with the focus of family activities,
- To create new housing projects and renewed residential areas with residential densities of at least 350 inhabitants per hectare (corresponding to 142 inhabitants per acre)

This goal is brought about - as mentioned above - by lack of appropriate land for urban development. These high densities will naturally lead to the functional horizontal stratification of new housing projects reflecting efficient utilization of residential areas and the most convenient use of building space. In this system the underground floors are devoted to utility services, stores and parking. Retail and shopping spaces, services, cultural and covered sport facilities are placed on the ground and in part on first floors. Other floors are used for housing while the top floor houses kindergartens and nursery schools.
- To promote housing as an inherit and desirable function with the PHUR,
- To create the new housing estates as relatively self-sufficient city units covering within their areas the basic needs in social and community services as well as employment facilities,
- To ensure a proportional variety of types of residential buildings as well as a proportion in the size of dwelling units corresponding to prospective needs,

- To increase the identity of new housing projects and to protect the identity of selected residential areas.

This goal is planned to prevent contemporary monotony of new residential areas. In the Master Plan it is assumed that about 85% of new dwelling units as well as 65% of structures for community services are to be built through the use of construction systems assembled from various prefabricated components. Thus, from the economic viewpoint, efficient construction systems and methods will be developed as well as produced in a wider spectrum of building applications involving layout as well as facade systems. These pre-fabricated systems will be produced in limited quantities. Reductions in production will be made possible by continued evaluation and frequent modification in models.

In areas, which will be centralized, the degree to which prefabricated construction systems are utilized will depend on prevailing physical and spatial conditions. In the PHUR as well as the adjacent inner city ring tradition construction methods will be predominantly used while new structures within renovated areas in the suburbs will be primarily built through the use of pre-constructed components.

- To ensure appropriate environmental qualities in residential areas,

This objective concerns a wide range of environmental factors affecting the quality of housing but only selected factors are mentioned here. Noise levels have been established at 55 dB for new and renovated residential areas and at 65 dB for reconstructed and maintained housing. As well as
relevant quality standards for air, water and city grounds, a quantity of open space and gardens are specified for individual city territories. The achievement of these standards is to be treated mainly by the reduction of surface transportation predominantly with residential areas the allocation of heating systems and fuels for the production of heat energy, wider utilization of natural spaces in block constructions for the creation of gardens.

- To promote walking as an optimal mode of transportation within community as well as neighborhood areas.

For short distances, walking can be considered as the most natural form of transportation, having in addition advantages that are significant from an economic, environmental and physical standpoint.

Therefore the new residential areas are to be formed as a well developed network of pedestrian transportation,

(Objectives for transportation):

- To create an integrated transportation system based on personnel as well as freight transportation utilizing individual transportation subsystems on the basis of technical/economic specifications and actual city demands.

The concept of passenger transportation is based upon the following projected trip statistics:
<table>
<thead>
<tr>
<th>LOCATION OF ACTIVITY</th>
<th>WORK</th>
<th>RECREATION</th>
<th>SHOPPING &amp; SERVICES</th>
<th>JOB RELATED TRIPS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequent Activity</td>
<td>Occasional Activity</td>
<td>Frequent Activity</td>
<td>Occasional Activity</td>
</tr>
<tr>
<td>Nearest of Residence</td>
<td>Walking MT</td>
<td>Walking Bicycle Moped</td>
<td>Automobile MT</td>
<td>Public Transportation</td>
</tr>
</tbody>
</table>


- To create a city transportation system that is derived from the specific physical conditions prevailing in the city,

- Specific physical conditions within Prague's inner city as well as the existence of historic structures under protection have in combination with the enormous territorial demands of individual transportation systems (have) necessitated that mass transit be given priority in the development of transportation across the city.

- To give a priority to the completion of a mass transit system based on the network of underground and streetcar lines with a supporting system of bus lines,

- The Prague subway system is to be represented in a final stage proposed in the Master Plan as a radial scheme of 4 principal subway lines. Subway lines are usually branched into 2 or 3 lines within the territories of
suburbs. After completion the subway network will have a total operational length of 93,5 km (58 miles) with 103 stops and stations. Street car systems will utilize selected existing lines that cross the city in tangential lines touching the CBD area. Some of these lines serving new areas with a high number of inhabitants will be operated by light rapid transit (fast street cars). Medium size buses running on electric power will serve those inner city areas which will not be sufficiently covered by underground or streetcar transportation. Classical bus routes will predominate in circular lines within the territory of the outer city.

The development of the subway is to take place in two phases. The first phase ending in 1986 will cover most frequented areas of the inner city. This will make possible a substantial reduction of surface transit now represented by bus and street car lines. The second phase ending in the year 2010 will gradually connect Prague's CBD with the longest residential areas and principal city centers located in outer city territory. Remaining densely populated housing estates will be served by rail rapid systems using longitudinally, physically separated lines.

It is assumed that city mass transit will serve 1,720,000 of the 2,520,000 passengers traveling within the city each day.

- To gradually develop the network of city expressways with necessary supporting facilities,

- The final planned shape of the expressway highway system depicts a network of radial highways linked with two circular expressways. This basic system will be formed within the territory of Prague City with the exception of Prague's inner city. The inner city territory is deliberately protected against expressway transportation and will be served by a pattern of existing
the thoroughfares that will be gradually reconstructed and interconnected with the expressway system.

- To proportionally reduce individual transportation within the PHUR territory, the achievement of this objective is to be supported by relatively dense mass transportation that sufficiently covers the entirety of the protected territory. The reduction of individual transportation will be predominantly achieved by administrative restrictions upon transportation. In these areas, the network of streets for general use as well as the capacity of parking that is available for private transportation will be very limited. The majority of streets in the PHUR will be accessible only to area residents, service and emergency transportation. On the other hand areas adjacent to the PHUR as well as selected mass transit stops and stations will be gradually equipped with parking and garage facilities. These will make possible easy transfer between individual transportation and mass transit.

- To promote pedestrian transportation within areas with a high concentration of inhabitants, this objective predominantly concerns all types of city centers. In the principal city centers such as the PHUR as well as some district and community centers, the pattern of purely pedestrian streets and other urban spaces has been designed and in some cases supplemented. These pedestrian systems are enhanced by appropriate facilities for shopping, services, culture as well as recreation. The proximity of mass transit stops and parking facilities is also a factor.

- To reduce long distance (intercity) transportation within the territory of the inner city,
This goal promotes the completion of the already undertaken reorganization within the system of inter-city bus terminals. When completed only the international and the most important lines connecting Prague with other larger cities will terminate near the CBD area. Other lines such as regional lines and remaining state transportation will end in those terminals spread in the suburbs. These terminals will be sufficiently equipped with mass transit lines.

- To create an integrated passenger and freight railroad system,

A radical rebuilding of the city railroad system, which will substantially simplify the existing network, is now under way. The final phase of this system projected in the Master Plan will consist of several freight depots spread in the outer city and several passenger stations with a principal railroad station located on the margin of CBD area. The freight depots will already developed and developing industrial parks as well as wholesale facilities within city suburbs. The principal passenger railroad station will serve the international and major industry connections while other stations will satisfy the needs for regional transit.

- To improve efficiency and to reduce freight transportation by truck within city limits,

This objective will be implemented through the development of an integrated pattern of wholesale facilities deliberately spread over the entire area of the city. Also the construction of unconventional delivery systems is to be provided. These systems, utilizing underground levels for automated freight services operated by computer, are especially advantageous in areas with a high volume of delivered goods, a strong density of population and lower environmental qualities. For the CBD area a unified underground service
system providing delivery as well as removal has been suggested and the first experimental segment of such a system is currently under study and being elaborated.

- To enhance the utilization of the Vltava river as a waterway for freight transportation,

- In relation to this objective several river transportation facilities will be gradually built and rebuilt for the purpose of increasing river transportation and augmenting the load capacity of rivercraft.

- To promote the distribution of various communication systems such as video-telephones and cable or closed circuit TV systems,

- The practical utilization of these systems is projected for the turn of the next century. It is also predicted that these systems would substantially reduce the amount of job related trips, university related trips, as well as some shopping trips.

(Objeectives pertaining to utility services):

- To ensure sufficient supply of heat energy for the fulfillment of the stated environmental standards,

- The implementation of this objective is based on the increasing utilization of domestic fuels as well as clean burning fuels for the production of heat. The efficiency of heat production and delivery will be enhanced by the rising use of heating units in dwellings and buildings as well as the use of power plants for central heating. A new policy for the production of heating energy has been proposed for the purpose of adhering to environmental standards. In 1990 the production of heat will be achieved through a combination of solid fuels (12%), liquid fuels (34%), and gaseous fuels (54%). This compares with a percentage of 89% for solid fuels,
5.5% for liquid fuels and 10.5% for gaseous fuels in 1970. Accordingly the structure of fuels used for heating is precisely specified for individual regions of the city. For example, the PHUR territory will be predominantly heated by electric power and the use of gaseous fuels, while heating energy for new housing projects in city suburbs will be generated by a combination of solid and gaseous fuels in central heating stations. Also, the heat produced as a by-product in nuclear power plants will be utilized to heat selected suburbs.

- To ensure a sufficient quantity of electric power,

Electric energy for Prague is obtained from city power plants as well as from an integrated state run electrical system. Electric power will be predominantly produced in nuclear plants as well as conventional power plants burning coal. The three nuclear power plants are projected at a near distance from Prague agglomeration. In the Master Plan the consumption of electric power is projected as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>1980</th>
<th>1990</th>
<th>2000</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumption</td>
<td>830</td>
<td>1350</td>
<td>2000</td>
<td>2850</td>
</tr>
<tr>
<td>kWh/inh/year</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- To ensure sufficient quality and quantity in what concerns water supply,

After the recent construction of a new sizeable water reservoir behind the boundary of the Prague agglomeration, a sufficient water supply has been ensured for several years into the future. Additional water resources will be obtained from reservoirs designed behind the boundary of Prague City as well as by the increasing utilization of Vltava river water treated in reconstructed and newly built water purification plants.
- To increase the capacity of liquid waste collection and removal systems as well as to increase the capacity and quality of liquid waste treatment processes,

At present the city sewage system is being fundamentally reconstructed and expanded. When completely implemented, this system will cover city demands as well as providing a required reserve capacity. As the capacity of the existing central treatment plant in the city will be completely exhausted in the years to come the construction of a new central sewage treatment plant having high capacity is projected for allocation behind the boundary of Prague's agglomeration. Existing sewage treatment facilities will use as a sewage pre-treatment process and as pre-pump station for the above mentioned plant.

- To enhance the periodic collection and removal of solid wastes. To enhance recycling and waste conversion methods within complex waste disposal processes,

For waste material recycling, a network consisting of predominantly existing collecting centers is being envisaged. Some of the largest collection centers for selected domestic as well as employment related wastes will be reconstructed and equipped with new technological facilities improving operational efficiency.

The number of incinerators fitted with equipment for the generation of heat will be substantially increased. It is assumed that pyrolysis technology, as an optimal method of waste conversion (thermal decomposition of waste), will be utilized on a wider scale after the year 1990. New landfills will be located behind city boundaries.
- The promotion and the construction of collectors for utility service lines.

- By Czechoslovak standards the collectors consist of tunnels lined near the surface and having a relatively small cross section. Collectors consist of one or two separated spaces currently containing all utility service lines. Collectors will be usually constructed in newly built or renovated areas. In the territories where underground freight and post delivery systems are to be developed collectors for utility service lines will become integral components of those facilities.
5. A comparison of physical planning for Baltimore City and Prague City

The last chapter of this study is devoted to a brief comparison in selected fields of physical planning for both cities. Some consideration pertaining to the general approach to American physical planning will also be mentioned. This comparison and those considerations would have to be accepted as the independent opinion of a European architect although they may not be fully objective in view of these limitations.

The comparison is focused upon characteristic elements pertinent to the cities and upon substantial differences in three basic areas including the contemporary situation, the physical planning process and the principal objectives and policies of comprehensive planning documents.

First I would like to review some figures and trends in the contemporary physical state of Baltimore City.

1. Baltimore city covers an area of 79 square miles with 783,320 inhabitants (Census statistics 1980). The city area represents only the urbanized core of the Baltimore metropolitan (urbanized) area and is considerably built up. Therefore, it practically has no vacant territories for extensive physical development. The physical development of the city is dependent upon the renewal or reconstruction of existing structures or must be implemented within the territory of the Baltimore Standard Metropolitan Statistical area (SMSA). The Baltimore SMSA consisting of Baltimore City and five surrounding counties occupies an area of 2259 square miles with 2,164,930 inhabitants.

2. Baltimore City faces a significant population decline that has accelerated over the last several years. On the other hand the population of the SMSA
has naturally increased as depicted by the following figures:

<table>
<thead>
<tr>
<th>Year</th>
<th>Baltimore City</th>
<th>Baltimore SMSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>949,708</td>
<td>1,457,781</td>
</tr>
<tr>
<td>1960</td>
<td>939,024</td>
<td>1,803,745</td>
</tr>
<tr>
<td>1970</td>
<td>905,787</td>
<td>2,071,016</td>
</tr>
<tr>
<td>1980</td>
<td>783,320</td>
<td>2,164,430</td>
</tr>
</tbody>
</table>

This is accompanied by a continuous decrease in the proportion of whites within a total population of the city.

In Prague, such disadvantageous depopulation in an area has been the case in the relatively small territory of the PHJR and has been slowed down in recent years. This was achieved by improvements in housing policy and the reduction of employment facilities located within this territory.

3. The labor force in Baltimore City represents 524,400 individuals and unemployment for 1978 stood at an average annual rate of 7.3% of the total labor potential. In the year 1980, the labor force could be broken up as follows:

<table>
<thead>
<tr>
<th></th>
<th>Thousands of employees</th>
<th>Percentage of total employment</th>
<th>Average Annual growth rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. manufacturing</td>
<td>80.6</td>
<td>15.4</td>
<td>-2.4</td>
</tr>
<tr>
<td>2. contract construction</td>
<td>21.9</td>
<td>4.2</td>
<td>-1.9</td>
</tr>
<tr>
<td>3. transportation, communication, public utility</td>
<td>39.8</td>
<td>7.6</td>
<td>-1.2</td>
</tr>
<tr>
<td>4. trade</td>
<td>115.6</td>
<td>22.0</td>
<td>-0.4</td>
</tr>
<tr>
<td>5. finance, insurance and real estate</td>
<td>39.7</td>
<td>7.6</td>
<td>+0.7</td>
</tr>
<tr>
<td>6. services</td>
<td>141.9</td>
<td>27.1</td>
<td>+2.0</td>
</tr>
<tr>
<td>7. civilian government</td>
<td>84.7</td>
<td>16.2</td>
<td>+2.3</td>
</tr>
</tbody>
</table>

|                       | 524.900               | 100%                          |                           |
In manufacturing, the food and production, the primary metal industry, publishing and related industries as well as the transportation equipment industry prevail. In other fields, professional services (such as medical and other health services, legal services, educational and miscellaneous services), retail trade, as well as state and local government dominate.

4. Demographically, Baltimore City has a disproportionately large population of individuals who are at or above age 65. This age group represents 11% of the city's population while being equivalent to only 7.5% of Baltimore County's population. Prague shows a similar trend in this respect.

In comparison to surrounding counties, Baltimore has the lowest percentage of individuals who have obtained the highest levels of education.

A comparison of 1978 Effective Buying Income (EBI) in Baltimore, Maryland and in the U.S.A. is depicted by the following chart:

<table>
<thead>
<tr>
<th></th>
<th>Baltimore City</th>
<th>Maryland</th>
<th>U.S.A.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBI Average Household</td>
<td>$15,032</td>
<td>$19,851</td>
<td>$18,722</td>
</tr>
<tr>
<td>EBI per capita</td>
<td>$ 5,389</td>
<td>$ 6,734</td>
<td>$ 6,552</td>
</tr>
</tbody>
</table>

This distribution of EBI indicates that nearly 19% of households have an income of less than $5,000 per year while more than 13% of households have incomes over $25,000 per year.

5. The physical structure of the city can be briefly described through a discussion of land use patterns, spatial composition, physical conditions of city structures as well as the centralization and the development processes.

Land use structure involving city centers, institutional facilities, industrial facilities, housing, recreational facilities as well as transportation and utility services, will be analyzed.
City centers are represented by a principal city and metropolitan center (Metro Center), one regional center, several lesser multiservice centers and a higher number of specialized professional service facilities spread predominantly within the inner city area. The majority of institutional facilities as well as commercial and business facilities are concentrated in the Metro Center or in surrounding areas. Industrial facilities are located along an extensive city harbor, advantageously utilized harbor facilities and a huge concentration of other transportation structures such as the railway and road network.

Housing is spread over the entire territory of the city. The majority of residential areas are composed of family row houses arranged in blocks. The average height of each dwelling structure is 3 stories. In out city the proportion of residential areas consisting of detached single family houses increases. Residential densities vary from 50-150 inhabitants per acre in residential areas in the core of the inner city to 25-50 inhabitants per acre in the inner city. The figure drops to a maximum of 25 inhabitants per acre in the outer city. Total housing stock was estimated at 302,680 housing units. Of these nearly 80,000 units are considered to be of substandard overall quality. Most of these units are located in the inner city where they represent more than 30% of total stock.

The contemporary structure of existing residential housing is represented by the following figures:

<table>
<thead>
<tr>
<th>Housing units located:</th>
<th>number:</th>
<th>%:</th>
</tr>
</thead>
<tbody>
<tr>
<td>in single family structures</td>
<td>212,108</td>
<td>70.1</td>
</tr>
<tr>
<td>in multifamily structures</td>
<td>90,572</td>
<td>29.9</td>
</tr>
</tbody>
</table>
Average area per inhabitant in housing units is estimated at 288 square feet. This compares with 167 square feet per person in Prague.

In 1976, new housing production within the Baltimore region represented the construction of 11,783 multifamily housing units and 3,119 single family housing units.

Recreational facilities represent a relatively dense network of various field houses, recreation centers, playgrounds, playfields and swimming pools that are more densely concentrated within the circle surrounding the CBD area. Recreational facilities of metropolitan and state significance such as museums, civic centers, theatres and galleries are predominantly concentrated in the inner city of Baltimore City.

Large open spaces with parks are mainly located in the outer city area.

The total area of public parks and recreational lands attains 5,800 acres and thus corresponds to an average area 35.8 square yards per inhabitant. This compares to 59.8 sq. yds. per individual in Prague.

While individual transportation maintains priority in the city's transportation resources, mass transit organized in the shape of a relatively dense network is increasing in importance. The proportions of work trips in 1977 in the Baltimore region utilizing mass transit and individual transportation are expressed by the following figures:

<table>
<thead>
<tr>
<th>Mode type</th>
<th>Total in survey:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
</tr>
<tr>
<td>Auto driver</td>
<td>727,100</td>
</tr>
<tr>
<td>Auto passenger</td>
<td>141,100</td>
</tr>
<tr>
<td>Mass transit</td>
<td>111,500</td>
</tr>
<tr>
<td>Taxi</td>
<td>2,700</td>
</tr>
<tr>
<td>others</td>
<td>9,600</td>
</tr>
</tbody>
</table>
The road system is formed of a dense network of major and urban thoroughfares as well as radial segments of expressways. The city expressway system has not yet been completed. Buses are operated in radial and tangential lines connecting Baltimore's suburbs (in surrounding counties) with the CBD area. Purely pedestrian streets are restricted to short segments in the CBD area and in recreational spaces.

In the field of utility services, fuels used for the production of heat and electricity substantially differ from those used for this purpose in Prague. Production in the Baltimore region is generated by the utilization of non-polluting fuels involving residual oils, natural gas and nuclear energy. This substantially contributes to relatively high air quality as well as overall cleanliness. On the other hand, environmental conditions along principal city thoroughfares are considerably damaged by high noise pollution generated by dense individual transportation and buses.

The spatial composition of Baltimore City logically represents the image of an "old city" on the eastern American coast. The downtown area is composed of tall non-residential buildings and skyscrapers that are gradually replacing former low density and residential structures built up in the second half of the 18th and the first half of the 19th century. This city core depicts constructions of various architectural qualities implemented in the period since the beginning of this century. Such CBD area have high employment densities and create the characteristic silhouette of Baltimore as well as many American cities. Areas surrounding the hub of Baltimore City predominantly represent residential row house structures built up in the
turn of the 19th century and usually having a height of 3 stories. The outer city area is mainly formed of low density residential areas consisting of row housing and detached single family houses, having usually a height of 2 stories. This part of the city was constructed after the year 1915. The structures of the inner city as well as outer city are occasionally diversified by multistoried residential and institutional buildings.

The terrain of Baltimore city is relatively flat and dotted by several shallow valleys with streams penetrating the outer city. In some of these valleys the natural landscape has been preserved and improves the general appearance of the city environment. The Chesapeake Bay with its inner harbor and with Federal Hill park expressively contributes to the spatial composition of the CBD area. Fort McHenry and several protected historic buildings complete from a cultural as well as city development standpoint the atmosphere of the city.

Several years ago the complex revitalization of the Metro Center and Inner Harbor began and at the contemporary state appears to be an exceptional and vastly successful city center renewal. Also the reconstruction of several selected original residential areas within the inner city were implemented with federal and state grants. Nevertheless, several other housing areas in the city are in critical physical condition and deserve reconstruction or renovation.

In what concerns the organization of the physical planning process, the comparison will be focused upon the municipal organization as it is involved in the process of contemporary physical planning, the basic structure of the physical planning process as well as several types of principal planning
documents and city development materials.

The Department of Planning is a Baltimore municipal authority having full power to formulate, review, propose and amend as well as keep up to date plans generally showing the proposed physical development of Baltimore City. Physical plans are investigated, studied and adopted by the Planning Commission which is at the head of the Department of Planning. The Planning Commission consists of three higher municipal officers and 6 individuals who are residents of the city.

In Prague physical plans are adopted at the highest municipal level by the Council of the Prague City National Committee with a personnel structure similar to the Baltimore Planning Commission.

In the Baltimore City Charter Provisions for Planning (Article VII - Department of Planning) only the Master Plan and Official D Plans are cited as principal physical planning documents. The Master Plan is described as follows:

"The Master Plan for the proposed physical development of Baltimore City shall consist of maps, plats, charts and such descriptive matter as may be necessary to depict the said Plan, and it shall show generally the proposed physical development of said city, and each map, plat or chart or other descriptive matter shall show one or more elements of the Plan. These maps, plats and charts and descriptive matter shall indicate the plan for the proposed physical development of Baltimore City, and shall show, among other things, the future general location and extent of all public improvements and enterprises, including among other things, the general location and extent of streets, highways, boulevards, viaducts, bridges, subways, tunnels and all uses of land for purposes of public transportation, and also the general location and
extent of piers, wharves, docks and bulkheads, and buildings or structures thereon, whether publicly or privately owned or operated, and also the general location and extent of publicly owned places of recreation, such as playgrounds, squares, and parks, and all public buildings and other public property, including school buildings, and all existing and proposed zoning areas or districts, and all public utilities, services and terminals, such as water, gas, electricity, sewerage, telephone, telegraph and transportation, whether privately or publicly owned or operated."

As stated, the Master Plan is empowered with the relevant planning authority in what concerns the interests of the public sector only, and its stipulations pertaining to the private sector remain at the level of recommendations. Therefore the overall value of such a Master Plan is substantially restricted.

The structure of planning process for Baltimore is shown in the following simplified chart:
This process is very similar to the one used for Prague. The planning process for Prague contains in addition, a synthesis of the objectives proposed for the city at higher levels of the physical plan such as the state or federal development plan. This complex hierarchy of physical plans, beginning with the national development plan proceeding through individual regional plans and ending with the city or town plans, makes possible the optimal utilization of existing intellectual and material potential as well as the assessment of prospective possibilities in individual territories within the county from an overall national viewpoint.

An important factor in the quality of comprehensive physical planning is the sophistication of computerized information systems. At the present the Baltimore information system represents an initial stage in the formation of a data base. The data base is developed by using selected information from U.S. Census statistics supplemented by processed information obtained from various urban related surveys and studies. The Baltimore city computerized data base in current use for planning purposes contains the following information:

- land use structure (containing owner, address, size, approximate acreage, land and improvement assessment, zoning characteristics and land use)
- capacity and conditions of sewer system
- capacity and conditions of water system
- capacity and conditions of streets and roads
- park conditions and inventory
- flood warning system

Baltimore city does not have an elaborated Master Plan. The City Master Plan is substituted for Baltimore's Development Program and several additional physical planning documents such as the not yet completed Comprehensive
Plan, the General Development Program for the Baltimore Region, Population and Employment Projections for the period 1975-1990 as well as a number of other plans are also used.

Baltimore's Development Program, finished and adopted in 1976, consists of two principal components. The first deals with the specification of policies, programs, approaches and issues for long-range city development while the second document (the Capital Improvement Program) summarizes the major capital improvements planned for the period 1981-1986. This short-range plan has been revised and adopted in 1980.

Baltimore's Development Program specifically discussed:
- Comprehensive Plan goals and policies that are being furthered by the Capital Improvement Program;
- Strategies, approaches, and programs the City is pursuing;
- Recent accomplishments - projects that have been undertaken during the past six years to realize the goals and policies;
- Proposed projects - those scheduled for implementation during the next six years;
- Others involved in decisions and funding - agencies and programs affecting the City's efforts to realize the goals and policies; and
- Outstanding issues and future directions.

Thirteen areas of activity are treated in this report: multiservice centers, economic development, public safety facilities, education facilities, library facilities, recreation and parks, transportation, solid waste disposal system, storm water management system, waste water treatment system, water supply system, housing and community development, and Metro Center.
The Baltimore Development Program including the Comprehensive Plan does not treat all important elements for complex and long range city development. This document only emphasizes land use structure and does not contain principal economic, socio-demographic, and environmental data comprising factors such as projected economic development, prospective employment structure, population projections, principles of spatial composition, the preservation of historic and other important structures, the production of environmental standards (noise levels) and other factors. Nevertheless both principal documents derive realistic long range as well as short range objective, policies and programs that can be achieved through the city's funding and implementation processes.

In comparison, the Master Plan for Prague has been elaborated in the complexity of contemporary knowledge in this field, as mentioned in previous chapters. On the other hand, the objectives and policies of the Master Plan at both the quantitative and qualitative levels are deliberately specified in many cases for "one step" beyond, what actual conditions make possible.
6. Notes

*1 In this sense, environmental conditions are perceived as factors contributing to complex environmental systems. This system consists of three principal components - society, material and non-material components that are man-made, and elements of natural origin. The system also includes linkages and internal relations between those components as depicted in the following diagram:
Relation 1 represents the enhancement or decline of the natural environment resulting from the existence and activities of society. This can lead to the stabilization or destabilization of the entire ecological system. This relationship usually affects all factors of the natural environment that are in turn perceived and adopted by society as components of the overall human habitat. Nevertheless, the management of society in the modern era implies the exertion of qualitative as well as quantitative influences on a majority of biological resources. These resources include forests, raw materials, crops, water as well as the climate. Influences upon these resources may bring about a decline in aesthetic qualities as well as biological qualities.

Relation 2 expresses the influence of natural environmental factors on society which can result in a positive or negative impact upon society. The influence of the natural environment is primarily evident in the following spheres and activities:

- aesthetic and psychological spheres
- biological and ecological spheres,
- material-economic spheres (such as the sources of natural materials - agricultural products and energy),
- natural hazards and other activities

Relation 3 represents the creation of a wide range of human production such as artificial components of the environment including settlement units, manufacturing and service units, operational systems and technology as well as various kinds of goods. The majority of these artificial components participate substantially in the formation of the complex human physical environment.
Relation 4 expresses the reverse effects on society of man-made elements in the environment. These effects can be felt in the material as well as intellectual areas. The sphere of social environment, in which elements as life styles and standard of living are classified, is predominantly influenced by the quality and quantity of elements that are of man-made origin. The possibility of technical hazards facing human society can be considered as a negative factor within this relation.

Relation 5 represents mainly the supply of raw materials and energy for the manufacturing of artificial products in reply to social demands.

Interrelation 6 represents social relations between inhabitants of particular urban societies. These comprise the linkages among various social, professional and age groups as well as relations between inhabitants and visitors. These internal relations are used to be searched in purely social spheres as well.

Interrelation 7 expresses relations resulting from the operational processes of the settlements - production, services and technical infrastructure (consisting of transportation and utility services). These relations are predominantly included within the independent economic sphere.

Relation 7 and 5 together contribute substantially to the formation of land use structures and physical linkages (technical infrastructure).

Interrelation 8 represents internal relations taking place within the scope of component of natural origin and expresses purely ecological linkages that are only rarely found in original state within urbanized areas.
These general goals and policies are clearly specified in approved and adopted planning documents at the federal or state level and the implementation of these depends on conditions within individual administrative territories. These objectives and policies express social and socio-technical principles adopted and valid for a certain period in the fields of housing, education, working conditions, medical care, recreation, culture as well as personal, family and retirement benefits.