MAY JUNE, 1969

NORTH CAROLINA



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NORTH CAROLINA



MAY/JUNE 1969, VOL. 16, NO. 5

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J. Norman Pease, Jr., FAIA



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NORTH CAROLINA'S NEW FELLOWS

Honors recently have come to two North Carolina architects—J. Norman Pease, Jr. of Charlotte and M. Elliott Carroll of Washington, D. C.

Pease and Carroll have both been named Fellows of the American Institute of Architects, the highest honor the national organization bestows upon its members.

Pease, the current president of the North Carolina Chapter of the AIA, was named a Fellow for his accomplishments in design. Carroll, a North Carolinian who is a member of the state chapter, was named a Fellow for his service to the profession. He is administrator of the Department of Professional Services at AIA headquarters in Washington, D. C.

The two Tar Heels were among 76 architects in the nation elected to the AIA's College of Fellows. Formal investiture will be held in ceremonies at the annual AIA convention to be held this year in Chicago, June 20-26.

Selection of the new fellows was made by a jury composed of the following fellows of the institute: William J. Bachman of Hammond, Ind., chairman; Clinton Gamble, Fort Lauderdale, Fla.; William Stephen Allen, Jr., San Francisco; David F. M. Todd, New York; Kenneth W. Brooks, Spokane, Wash.; O'Neil Ford, San Antonio; and Joseph D. Murphy, St. Louis, alternate.





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URBAN INFRASTRUCTURES WORKSHOP I

Raleigh: 2000

The Future of a City

Cities in North America are responding to population pressures by expanding rapidly away from their original centers. The phenomenon of urban sprawl, which has been extensively analyzed and documented for larger cities in the megalopolitan regions of the nation, can also be observed in Raleigh. Early theoretical premises of urban planners were based on the cost of overcoming distance; transportation costs, it was argued, would tend to keep our cities compact and densely populated. Today, the fallacy of this argument is manifestly apparent in the rate at which low density suburbs and their related commercial developments are consuming the rural environs of cities. If the present rate of expansion is maintained, and if the density of development continues according to current subdivision standards, then most of Wake County will be urbanized by the year 2000. But this is not the real crisis: Rather than set aside land and facilities for future use according to rational systems of allocation and control, planning authorities are weighted down with resolving current social and economic problems. The future costs of incremental planning activity are immense. Raleigh needs an objective and exhaustive study of both its current and future growth needs if the city is to be the vital metropolis that its potential indicates.

Urban Infrastructures Workshop I

The School of Design at North

Carolina State University in Raleigh began its first comprehensive study of the City in September 1968. UIW I is the first of a series of studies dealing with problems of urban design and planning for the metropolitan area. While this study deals mainly with planning for environmental systems in the public sector, future studies will, in fact, deal with project area planning, low income housing, community action-oriented redevelopment programs, and other small scale problems. UIW I began with the controlling framework offered by public expenditure, and, using this framework as an infrastructure, explored the possibilities of future city-building. The fifthyear architecture workshop in which this study was conducted was predicated on the assumption that the form of the city is the resultant of societal and environmental forces in natural conflict. Resolving this conflict according to interdisciplinary methods of analysis and research became the major thrust of the workshop. although the final focus was always on the three-dimensional form of the city and its environmental systems. After a semester's work, seventeen fifth-year students had put together a picture of the growth of the city by 2000 A.D., as well as answering some of Raleigh's immediate social and economic problems.

Client and Basic Mission

An assumption was made that the members of the workshop were acting as a coordinated research team under the leadership of a director whose basic

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Contributors:

J. L. Binkley J. W. Brown J. B. Carroll D. E. Deremer E. S. Edwards I. A. Fraser W. J. Hedrick J. G. Karpick W. A. McClure M. C. McNamara K. M. Phelps P. B. Poetzsch J. J. Rose M. Sophark R. G. Steele O. D. Wally H. C. Watkins

Professor Peter Batchelor, Workshop Critic. mission was to develop a plan for the public facilities of Raleigh by the year 2000. In this case the client is the city of Raleigh, and since this is a representative political and administrative body, the real clients are the citizens themselves. The actors in the situation are all the legal, political and social participants whose actions and decisions influence the physical form of urban and non-urban developments. The client, then, is composed of a diversity of actors whose decisionmaking processes lead to a series of outcomes which are translatable into physical results. Thus, the workshop acted collectively as a consultant to optimize the goals and objectives of the actors in terms of environmental design.

Assumptions

UIW I was divided into two halves. The first half dealt mainly with mapping the metropolitan area of Raleigh in terms of its economic, social, cultural, natural and man-made environments. The second half dealt with developing a program and plan for six environmental systems: Government and Administration; Health and Welfare; Education; Recreation; Movement; and Housing. Each of the six teams utilized former mapped information as constraints to the development of the systems, as well as a few general assumptions dealing with population and housing trends. Gross population projections developed by the Research Triangle Regional Planning Commission were interpolated for one-year increments between 1968 (117,000) and 1980 (175,500). The projected population for the year 2000 was taken as 322,000. Housing trends for the 1950 to 1964 period were utilized to give some idea of house building activity as a correlate of population change. Finally, some additional assumptions were made about change in population composition in order to arrive at the relative distributions of persons by age group, sex and race. Thus, advances in gerontology and public health, declining birth rates in specific age groups, and changes in in-migration were assumed in calculating the population composition for the future.

Target Date

The rate of social and economic progress is so rapid that we are now "living in the future". UIW I concentrated on defining a series of short-range objectives to meet currently programmed system deficiencies for periods ranging from 2 to 7 years. However, 2000 A.D. was utilized as a target year about which to contemplate long-range growth. Therefore, a general picture of metropolitan growth was established for about 30 years from now, and specific projections were made for individual environmental systems.

General Systems Analysis

Systems analysis was one of the techniques employed in the workshop to facilitate the structuring and definition of problems. If a system is defined as a set of interrelated variables such that a change in one of them produces **predictable** changes in all the others, then an urban system requires that we define those variables and their interrelationships. An urban system is dynamic and open-ended — that is to say. capable of evolution - whereas other systems may be static and closed. In general, systems analysis has three interdependent phases: Definition of performance requirements, formulation of general concept, and descripition of alternative systems (1). Each phase is capable of recycling and of influencing changes in the other two. Thus, the inability of all alternatives to meet specific performance criteria might result in changing those criteria.

Workshop Concept of Systems

General Systems Analysis is an all-purpose tool for dealing with complex, but discrete phenomena. Urban system analysis introduces a new dimension in the form of time (2). Analysis of trends yields data relevant to changing relationships among systems variables, which in turn influences the definition of these variables and the community objectives or performance criteria. An urban system is composed of many subsystems, each of which has its own operating rules and components. Urban subsystems may be both physical and nonphysical, and the descriptions of the components vary accordingly. In the initial phase of this workshop, urban data was studied in terms of physical and non-physical systems as follows:

> Physical: Natural Man-made

Non-Physical: Political Economic Demographic Cultural Social

During the latter phases of the workshop, however, the systems were defined as belonging to the public sector and included the environmental systems indicated below.

Environmental Systems Teams

Six environmental systems design teams were set up to handle the development of a program and plan for facilities for government and administration, health and welfare, education, recreation, movement, and housing. The general analytic processes used by most teams involved developing an inventory of existing facilities, defining system deficiencies on the basis of contemporary criteria, setting up short and longe range objectives to meet these deficiencies, selecting resources to meet the objectives, and finally, proposing an infrastructural design concept in program and plan form (3). The separate systems teams were encouraged to think in terms of supporting vested interests, or seeking to maximize their own advantage, rather than attempting to make simultaneous tradeoffs. Deficiencies were assessed by examining system capacity and relating it to the demands created by users of the system. Objectives were set up for short and long range time periods, and resources from both private and public sectors were sought as ways of meeting these objectives. Finally, the overall design

concept was expected to have a concept of strategy built into it, since city-building occurs over time.

Urban Programming And Design Team

The work of this team was somewhat different from the systems design teams in that the number of analytical steps to be considered were four rather than five. and that the emphasis here was in the resolution of conflicts between the six environmental systems teams. This team was concerned with setting up a dynamic model of the development process of Raleigh according to the following steps: Definition of systems deficiencies, examination of future objectives, identification of resources, and allocation of resources over time. The team's role was a dynamic one in the workshop and helped to generate balanced alternative growth models.

Product of Workshop

Three months' investigation of Raleigh yielded a large amount of bibliographic information, maps of socio-economic and physical data, and projections for the future. Much of the work shown on the following pages has been taken from a public lecture and display staged at the School of Design in Raleigh during February 17 to 24, 1969, although a large amount of written research material has been excluded for the sake of brevity. For additional information on the study contact Professor Peter Batchelor, School of Design, N. C. State University, Raleigh, N. C. 27607.



General Systems Analysis. In real design processes each factor is capable of changing the other two, thus leading to convergence and ideal, or optimum, solutions.



Urban Systems Analysis. The influence of the fourth factor, generalized population trends, leads to an evolutionary, open-ended concept.



Workshop Concept of Systems. Seven environmental systems teams engaged in parallel activity with an overall urban design team. Interaction among teams is indicated by feedback lines.



NATURAL ENVIRONMENT	John B. Carroll O. Darryl Wally	
DEMOGRAPHIC ANALYSIS	Eugene S. Edwards, Jr. Mano Sophark	
ECONOMIC ANALYSIS	John G. Karpick John J. Rose	
COMMERCE AND INDUSTRY	Iain A. Fraser	
RECREATION	John W. Brown, Jr.	
GOVERNMENT	William J. Hedrick Wesley A. McClure Harry C. Watkins	
MOVEMENT	Michael C. McNamara Robert G. Steele	
HOUSING	Douglas E. Deremer John G. Karpick	
EDUCATION	Eugene S. Edwards, Jr. Kenneth M. Phelps	
HEALTH	lain A. Fraser	
WELFARE	Paul B. Poetzsch	
UTILITIES	William J. Hedrick	
URBAN PROGRAMMING AND DESIGN	James L. Binkley John B. Carroll John J. Rose O. Darryl Wally	

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John B. Carroll O. Darryl Wally

Thesis

The natural environmental analysis was conceived to determine if and to what extent the natural environment has played a role in the development of the city. More importantly these studies were conducted to provide a framework within which the natural environment could be used as a tool for the determination of the city's physical form.

Analysis and Pattern Structures

The studies of the natural team originated with regional analysis of the sub-surface geology, surface soils, and ground water systems, both existing and pro-The three proposed posed. reservoirs would form a physical boundary to the city and immediate region. Other potentials are also evident. such as recreation and natural development, as well as power sources. The whole Raleigh region is a potential aguifer and the potential foundation problems lie in the areas of Mica Gneiss and Mica Schist. The regional soils also point up general foundation limitations that may be present within each area, as well as other limitations.

When seen in the context of a natural environmental bias, certain patterns of expansion and growth are revealed. At the citywide scale Raleigh is found to be generally situated along one major ridge running south-east through the center of the city, expanding to the adjacent ridges of the south and north. The local flood plains and drainage areas are also apparent here, draining Raleigh by the five major tributaries of two streams into the Neuse River and proposed reservoir at the south-east tip of the city. Based on these physiographic characteristics of the city, the team found that major roads generally fell along ridge lines for drainage, efficiency, and aesthetic reasons. Local soil analysis revealed that the best location for building lay on the slopes. It also revealed correlations between basins and undeveloped lands as flood and drainage controls.

Although these patterns were followed in several instances, the implied development was still largely based on economic profit incentive with little or no regard for ecological processes. An example of this is found in the placement of large commercial centers within well defined flood plain regions—a decision which violates practically all ecological principles of conservation and development.

Synthesis and Direction Proposals

This situation forces the development of a value system based in a historical context, on aesthetic and scenic potential, and most importantly on ecological principles. This was done to provide the natural environmental system with "trade-off" capabilities in working with the other systems of the city's infrastructure.

DEMOGRAPHIC ANALYSIS

Eugene S. Edwards, Jr. Mano Sophark

For the purpose of this Workshop six areas of demography were investigated. By plotting these six areas of study by census tracts for 1960, we were able to establish a base in regard to population composition and distribution for further use in the Workshop. The six areas of study were 1, racial composition, 2, median income, 3, level of education, 4, family size, 5, female age composition, and 6, male age composition. Also for this Workshop graphs were constructed to illustrate the population pyramid, the comparative population of Raleigh with North Carolina and the nation over the last 30 years, the marital status of both whites and blacks, and the annual income of the population.

Racial Composition

As evidenced by the very minute portion of foreign-born immigrants within the Raleigh SMSA, the composition has become predominantly biracial. Only about .9% of the cities' population is foreign born.

The increase in the number of Negroes has grown within the city during the last 20 years. The Negro population has grown from 15,818 in 1940 to 17,871 in 1950. By 1960 the black population had grown to 21,942 with the overwhelming majority concentrated in the six highly segregated tracts in the southeastern portion of the city.

This concentration of non-white population results in quite a stratification in the economic fabric of the population. Accompanying this is a very low income

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John G. Karpick John J. Rose

level. The opposite is true for the portion of the city directly opposite to the northeast.

Income and Education

As can be expected the level of income is proportionate to the amount of education acquired. In the southeastern portion of the city the amount of education is lowest and in the northwest the highest with the surrounding band constituting an average between the two.

Also somewhat related to all three of the previous studies is family size. The largest families are found in the southeast and interestingly enough in the higher-class sections to the north and northwest.

Age Composition

The average male age is 25.6 years with the majority of those in that age range being found around the center of the city. It is also evident that the centercity constitutes the largest composition of those in the older age groups. This is also true for females with their average age being a little higher than the males at 27.7 years.

Summation

With the compilation of this information a more comprehensive understanding of its value became apparent. With our current social problems, most of which are found within our urban complex, such studies provide a substantial base upon which social scientists and urban designers and planners can begin to work. In any urban study a study of this nature is almost a required initial input.

Such a study becomes a valuable tool in the process of solving our urban problems. It gives an overall view of the population from many varied perspectives. These overviews in most instances readily point out areas of deficiencies and incongruities within the system. It then gives the designer or planner or social worker a point of reference from which they can begin to formulate programs for the solution of the existing problems.

Economic Conclusions

The conclusions concerning the economic base of Raleigh are derived from three studies; research findings relating Raleigh to its region and the nation, a comparison of Raleigh's industries, and a study of Raleigh's employment components.

Raleigh, predominantly agricultural region, is growing as a regional and governmental center. Raleigh's personal and median income are generally below that of the country. However, Raleigh's employment ratio is higher than either North Carolina or the country.

Government is Raleigh's most important industry, followed by finance, insurance, and real estate, then service, and finally manufacturing. Raleigh does not have a large service industry nor does it have much manufacturing.

Raleigh's economy is, in general, based on its white collar industries; government, finance, insurance, and real estate. With Raleigh as the center of an agricultural region, the trade industry is most important to the economy. Agriculture is seen to decline in future years.

A great change will take place in Raleigh's employment with the advent of a cybernated society. Raleigh's employment is increasing at a very high rate, but due to technological advances, it may level off by 1980. Industries that demand large employment would find it advantageous to move into this area due to low wages and a large labor pool until 1980.



lain A. Fraser

Image of Future Life Styles

The ecological community of Raleigh will evolve into a position of increased specialization economically, being supported primarily by the government industry and the finance, insurance, and real estate industry. The city will function and relate to other cities under this specialized role.

Exploitational efficiency will enable the Raleigh Economic Region to continue to export its agricultural products extensively.

The population explosion, especially in Raleigh, will continue the demand and need for housing. This demand will be met with industrialized housing of all types. The symbolic significance of the colonial mansion will generally diminish as a form determinant. Instead, building in Raleigh will be characterized by an increase in the emphasis of character expressions within the capability of industrialized housing. Thus, individual homes will be constructed without traditional reference to objects and places, like large yards, fireplaces, and columned porticos. Emphasis will be placed on an efficient functional home with an increase in the importance of the symbolic character of family life and its internal and external relationships to the community.

The economic unit, the family, will be supported equally by the wife and husband. They will choose their respective occupations so as to maximize pleasure from working. Basic subsistence like cooking and shopping will become much less time consuming. The time saved by mechanical innovations will be added to, among other things, by the extra free time created by the introduction of the thirty hour work week.

On one hand, large corporations are forming as a result of the cybernated industrialization, while on the other, many community groups from all classes will organize and devote the previously mentioned large blocks of leisure time towards constructive community projects. These groups will include church groups, neighborhood groups, and occupational groups. The completed beltline and extensive road network in the city as well as highly efficient electronics communications will be even more conducive to group interaction. The three economic groups which represent the three ethnic aroups in Raleigh; the white office worker, the black worker, and the white worker, will become intricately interwoven and thus striving for community harmony.

Past Developments

The old commercial and industrial areas of the city developed in a time when railways were the principal transportation system and the city itself was much smaller and more centralized. The manufacturing plants located along the rail routes and were near the city labor force. The wholesale establishments sited themselves conveniently near the rail routes and the manufacturing plants. Retail trades and services grew up in the heart of the populated area-the old city center.

Present State

The impact of the car and the truck was very great in the city's growth pattern. The car mobilized the population; they could now live far out in the suburbs and drive into the central city. Retail trade and the services responded to this expansion in the development of the shopping center. Wholesale trade, no longer so dependent on the railroads, needed more horizontal space and moved to the outskirts of the city away from the city center industrial areas. New industry also tended to establish itself on the outskirts where land values were lower. Heavier industry still located along rail routes although not necessarily in the heart of the city.

Future Trends

Following the outward movement of the residential areas, retail trade and services will continue to follow, and more automated industry, no longer so dependent on the proximity to a labor force

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will tend to break its bond with the city. Small manufacturers may stay in the city center where services they cannot economically provide for themselves are available. The retail and service trade will be more automated as well, particularly in the purchase of basic household goods. Shopping trips for more specialized purchases may tend to become an almost recreational pastime, particularly as the quality of the shopping environment improves to attract the customer.

Definition

Under the impact of social, physical and technological changes the average individual finds himself with more and more leisure time. Leisure time can be spent in idleness, meditation, or other states of physical inactivity. This use of leisure time is difficult to study as its relative merits depend completely on the psychological make-up of the individual. Also this type of leisure activity generally produces no effect on the environment. These two facts lead us to define recreation as leisure activities which cause entertainment, pleasure, relaxation, instruction, or the physical, mental or cultural development of the individual.

Problem

The social, physical and technological changes which make more leisure available also make it increasingly difficult to achieve meaningful recreation. In our present socio-economic framework, recreational opportunities are affected most adversely by change. There is much apathy toward the recreation system because of its complexity and seeming adequacy.

System

The recreation system consists of three components; 1, the user, 2, the facilities, 3, the activities. The user component was defined in this study as the population of Wake County and any visitor to this area. Age, sex, and socioeconomic position are the critical characteristics of this component. These characteristics can be studied in other sections of this publication. The facilities were defined as any part of the physical environment used by the participant during recreation but not owned by him directly. This category includes the road system, lands, waters, structures and equipment; both public and commercial. The most useful and direct breakdown of facilities can be accomplished by separating indoor and outdoor. For further analysis we separate facilities by type of ownership. These categories are federal, state, county, and commercial.

Deficiencies

The following is a list of the most significant deficiencies of the recreation system. 1, public recreation areas are not being designed to preserve and enhance natural land and water resources which are plentiful in the area at the present time. 2, land acquisition policies create a static park system which is unresponsive to shifting urban populations. 3, the present public recreation system provides only minimal facilities for young adults and middle-aged citizens.

Suggested Actions

In response to analytical conclusions about systemic deficiencies, the following actions are suggested. 1, a positive action policy should be formulated and enforced for new residential development. 2, an urban parks zone should be maintained in the high density areas. In this zone special measures such as vest pocket parks and mobile multipurpose centers would be used to serve shifting population. 3,



William J. Hedrick Wesley A. McClure Harry C. Watkins

the present municipal recreation program should be expanded in scope to include all age groups and as many special interest groups as possible.

National Situation: A Clue to Urban Government Problems

Local government, in its structure and operation, continues to be one of the most serious problems encountered in the solution of urban difficulties. The need to modernize urban government structure and activity is acute. Several specially created national commissions, task forces. and committees, both public and private in origin, have stressed the need for basic change in urban government to meet the needs of today's complex problems. The independently derived suggestions of such study groups inevitably point to the same basic difficulties and tend to suggest similar alternatives for action.

Local Situation: A Model of the National Condition

The Government Team studied the problems of local government in Raleigh to determine changes necessary to mobilize public resources to satisfy local problems. Raleigh presented a considerable challenge, for its role as state capital complicates the problem encountered in other cities in simplified form. State and Federal government activity strongly affect Raleigh city form, as do the activities and functions of county and municipal govern-Basic problems were ment. identified in each area of governmental influence, and attempts were made to formulate alternative patterns for government.

Team Analyses: The Government-City Fabric Physical Fabric

The Government Team charted for the first time the influence of all government owned lands on the form of the city. All levels of government were included in this study. This survey dramatically revealed the significant effect that Public lands have had upon Raleigh city form. The various levels of government which prevail in influence over the portions of this property were indicated.

A second study further defined land usage designation of public properties at a larger scale. It indicated the influence of various levels of government control. The following basic segments were charted: educational usage, correctional usage, unassigned usage, health usage, recreation, and government center.

A third level of studies of the physical fabric for government accommodation followed at a still larger scale, with specific attention given to the "government center" and adjacent nongovernment areas. A physical inventory, visual analysis, relative land value survey, and survey of the existing government center plan comprised this basic analysis. Studies were also compiled indicating projected growth of the various functional divisions.

Administrative Fabric

The Government Team proceeded with studies to determine the decision-structure and particularly the decision paths that



affect particular aspects of the physical fabric. These studies concentrated upon the lower levels of government. Municipal government decision paths for zoning, education, and County Government decisions for zoning, education, and health were the principal emphases of these studies.

Team Synthesis: Development of the Government-City Fabric

Development plans for the government center were based in the principal suggestions for local government reorganization. These suggestions were an outgrowth of the goals stated for government and the deficiencies that led to these goals and the development of strategies. The government center plan resembles the present state capital plan to some extent, except that the emphasis has been placed upon the development of spatial entities and physical elements as they reinforce these spatial units.

A system for inter-governmental communications and transport was included in this plan. This system ties the central facilities for local government to those of higher levels. County government and city government were suggested for combination as a new governmental unit entitled Metropolitan government. This unit would be coordinated by functions administered in a portion of the government center. Functions such as planning, and utilities, would be tied to the community structure of local government. This would be facilitated through a Community Service Center System based on analyzed service boundaries, neighborhood social units, and economy of scale criteria.

The overall government plan was based on the philosophy and fact that all levels of government existant in Raleigh and influential in determining the form of Raleigh should be coordinated for the benefit of the city.

Introduction

The first part of the movement study sought the establishment of three types of goals which we felt could reasonably be achieved in the next thirty-two years. These were short range, long range, and optimal goals.

Short Range Goals

As short range goals, we designated; completion of the beltline, improvement of existing bus facilities, redistribution and concentration of parking space, and a restudy of existing and future plans for the location of high speed, high volume, private vehicle rights of way.

Long Range Goals

Next, we designated as long range goals; maximum separation of pedestrian from wheeled traffic, more efficient interchange of inter-city and intra-city commercial traffic, a safer, more efficient, and more convenient link between the cities in the Triangle Area, the area universities, the Research Triangle, and local industry, providing a greater variety of movement choices for a greater variety of trip desires to affect a more balanced movement system, and, finally, separation of commercial and public transport from private traffic on new, old, and renewed movement facilities.

Optimal Goals

The implications of these short and long range goals helped us establish what appeared to be the optimal goals for a movement system for Raleigh in the year 2000 A.D. These we designated as; integration of the movement system with other systems of the city, such as commercial and civic centers, to lessen the effects of the movement system as a barrier and to increase its effect as a generator of activities at a human scale, and providing the means for public and private transport between, within, and to segments of the city that are so efficient and so convenient as to be incidental to the pattern of life it is to serve.

Synthesis

The second part of the study was the synthesis of available research on the subject, projections for 1985 and 2000, and available resources, with our goals.

Proposal for 1985

The first phase development of the movement system shows the central area of the city has been almost entirely restricted to public transport and certain private vehicles to relieve congestion.

Proposal for 2000

The extension of the 1985 system and the entire movement system for Raleigh for 2000, improves public transport which greatly lessens the need for private vehicles, but still provides for most of the less densely populated areas of the city; thus providing a wide range of choices for the traveler.

Scheme Summary

As the density of the central city increases, an efficient local bus

system for the whole city will be supplemented by an express system which will speed workers and visitors in and out of the city center. The express bus system will continue around the beltline which will serve fringe areas as well as highway oriented housing and shopping centers. These buses are designed for high speed but they can also be used on low speed multistop runs.

The existing railroads will be retained in the city although air rights will be built over in some places. Freight yards will eventually be moved to the city edge to better serve the industrial parks and the wholesale-retail interchanges. If the railroads cease to serve as passenger and mail carriers, the in-city rights of way will be used, if necessary, as an intra-city rapid transit system.

Existing Facilities

Raleigh presently has 36,000 dwelling units contained in approximately 9,000 residential acres. This gives an average of 4 dwelling units per acre, but the median number of units per acre is approximately 2. The present density ranges from 6 families per acre downtown to 0.1 on the outskirts. Presently, 19,000 acres are developed in Raleigh, with 45,000 acres yet available for all development. Of this acreage, 22,000 have been allotted to residential use.

Future Needs

By 1980, approximately 18,000 dwelling units will have to be developed for projected populations (this is half the number Raleigh now has). This is 1500 per year. By 2000, an additional 42,000 units will be needed; or 2100 per year starting in 1980. These needs in no way reflect the dwelling units that will have to be repaired or rebuilt.

Concept

The concept developed is one of unity through diversity. By developing Raleigh's identity, a unified city will evolve. Raleigh is a government center, a business center, and a regional trade center. Raleigh is a place to live and play. By interrelating these activities, a unified city will evolve: a city with endless opportunity for casual conversation and face to face meetings.

A city's identity can be developed by confining and reducing urban sprawl. Raleigh's identity may be developed by creating

MAY JUNE 1969

EDUCATION

Eugene S. Edwards, Jr. Kenneth M. Phelps

nodes of activity: shopping areas, recreational areas, and things which people can identify with such as places of social intercourse. By integrating man with nature, identity is developed. Future life styles indicate more free time due to shorter work weeks. More land will be needed for recreational facilities. By retaining the intimacy and charm of Raleigh, its identity is developed. The old homes of North Blount Street, Capitol Square, The Rose Garden, all create pride in a city. By expressing and exposing the character and flavor of Raleigh, its citizens can strongly identify with the place where they live, work, and play.

Proposal

This concept leads to a more efficient land usage. By increasing densities (families per acre), many desirable things result; more land is made available for recreational facilities, educational facilities, and natural areas, therefore more amenities can be obtained. Higher densities of people can afford and support more and better urban facilities.

High density areas would be developed near major transportation crossroads, existing and proposed. At these sites, major shopping centers have been or would be developed such as North Hills and Crabtree Creek. Entertainment would be a part of these facilities. This is the unity in diversity; the complexity which is the essence of living in cities. The downtown area would continue its role as a government and business center and become a cultural and residential area as well. The outlying residential areas would then focal on this strengthened core as it becomes the heartbeat of the metropolitan area.

A variety of housing types are proposed; single units, town houses, low and high rise apartments. High densities would be complemented by low densities. High densities would be 15-20 families per acre, medium densities would be 5-14 families per acre, and low densities would be 4 or less families per acre.

It must be remembered that Raleigh's median density is 2 families per acre. This compares with London at 45 families per acre, New York with 120 per acre and Cumbernauld, Scotland at 32 per acre.

Dwellings would be identifiable, individual, and would cater to a wide range of family size and activity. Each dwelling would be easily serviced, near automobile parking, and would be linked by pedestrian walks, bridges, and galleries to a central area for transport, recreation, and specialty shopping.

Raleigh can become a viable center, if a plan for the future is now instituted, if the people begin to take a greater pride in their city. Raleigh, like any other growing city in the United States, is faced with the problem of providing for great expansion in her public school facilities — both in capacity and in technology. Research undertaken through UIW Workshop has indicated many of the changes which might come about in the field of education.

Proposal

In part, these proposals entail a redefining of the educational configuration. The child's "schooling" may begin several years before age six; kindergarten may come to be state supported like grammar schools, and age groupings readjusted to accommodate grades K through 4 in the same facility --- the "primary school." To correspond to what is now grades 5 through 8 we propose the "middle school;" for grades 9 through 12, the concept of "educational center" is proposed. Located so as to profit from contact with the political, economic, social, cultural, and recreational centers of the community, the educational center can provide a more complete introduction to the society than the child can receive from a narrow alimpse through the academic world alone. Consolidation allows the utilization of economies of scale in provision of facilities. Future improvements in transportation would allow widely separated and diverse social, economic, and ethnic groups to attend the same educational centers; the increased opportunity for interaction, leading to the early development of understanding and acceptance of differences, is not to be underestimated. Furthermore, school facilities will become more available to the general public, for continuing education or cultural or recreational events, perhaps being in use as much as 4000 hours per year.

The Process

The process of education itself will become geared even more to the individual student, rather than to the "class" or "grade." This could be brought about through basically two methods: firstly, a "team" approach to teaching in which general instruction would be given by a basic teacher without a highly specialized background, leaving organizational duties and remedial and special instruction to better-paid and more experienced educators; and secondly, the increased use of electronic communicators, computers and "teaching machines," which would tailor the course to fit the individual student, and allow him to assimilate information at his own rate.

But theory, while important, can accomplish its greatest benefit only through the proper physical facilities. Thusly, the school system itself must be modified to coordinate with any new theory accepted. Though our problem deals with a proposal for the year 2000, we recognize the importance of transitional plans to bridge the intervening thirty-two years; realizing the precedent of educational plans for five year periods, we chose the year 1973 for short-range goals. By con-

sidering data concerning expected density of housing derived from population projections, and from research into expert opinion about optimum size of schools, we arrived at the number of new schools needed. and chose general locations, The area is divided into five districts, each having either an existing high school or a new educational center. By the year 2000, we predict Raleigh will need eight of these educational centers (with appropriate redistrication), each center able to expand to enroll 5000 students if necessary.

The Operation

The physical condition of Raleigh's public schools vary greatly from old to new, but generally speaking, we find that the elementary schools are the oldest and smallest, and the high schools are the most up to date. As the elementary groups grow and demand more space, new schools will be built and present junior high schools converted to this purpose. Likewise, junior high groups will move into new middle school facilities and existing senior high plants. The senior high of today will grow into newly constructed educational centers, or use existing senior high schools.

Each educational center district will be comprised of four or five middle school districts, each of which in turn contains four or five primary schools. Though transportation improvements allow one educational center to draw from a large area, the primary schools must be kept small and on the neighborhood level, in keeping with the social world of the small child. By siting the primary school within the residential neighborhood, the child is enabled to walk to class without crossing a traffic artery. Open spaces are retained around the schools for recreation and aesthetic satisfaction.

Conclusion

Reviewing our work thus far, we find our proposals to be an extremely expensive and complex undertaking; school administrators today are limited in their accomplishments by the finances available. It is necessary that everyone — including the general public — realize that any plan dealing with providing for the future education of our young citizens can be implemented only through the availability of finances which we do not today allocate to education.



The Situation

Two major problems appear in the present system; different levels of health status in different parts of the city generally corresponding to the income and demographic distribution, and inadequate teaching facilities for health personnel such as nurses and technicians. Other difficulties include the coordination of emergency patient histories. Furthermore, the expected growth in population will result in expanding requirements for facilities and staff.

To meet these problems and requirements, a three part plan has been proposed.

Prevention and Diagnosis System

This will incorporate health education programs in schools, on television, and eventually through home computers, combined with public safety systems such as the fire departments, traffic planning, rescue services, etc., to aid in the prevention of injury and disease. The diagnosis of disease will be centered about remote diagnosis units readily available to the people and which can be introduced in stages as they become feasible. First, mobile clinics will be used, then permanent remote units; finally there will be automated remote units in the neighborhood or even the home.

Central Registry System

The heart of the health system of the future will be the computer center, correlating remote diagnosis with patient history, prescribing treatment or issuing instructions, and making health histories available to authorized personnel as an aid to providing correct treatment. The computer can also store Medicare and Social Security information. Histories can be compiled throughout an individual's life, at birth, during school, and during military service, as well as a result of treatment.

Hospital and Health Facility Expansion Plan

This plan is staged to meet the continuing population growth. The following checkpoint years indicate the facilities that should exist at that time.

- 1975 Renovation of Rex Hospital into an extended care center
 - Building new Rex Hospital

Building of new nursing school (500 beds)

Building of old age home (150 beds)

1985 Expansion of Wake Hospital

> Expansion of New Rex Hospital

> Building for additional old age beds (250)

2000 Building of new hospital Expansion of Wake Hospital

Additional old age beds (500)

The Problem

The principles of redistributing the wealth of the nation are currently confined to a limited segment of our nation's population. However, in the future, due to cybernation, the need for distributing the wealth created by mechanization will become critical. Business will become a wealth generator rather than a wealth manipulator.

Due to the cybernation of the future, the poverty and social injustice of today will be aggravated. A program must be established to deal not only with our immediate needs but with the projected economic changes of the year 2000.

There is an immediate need to deal with the old problem of the rich getting richer and the poor becoming poorer. Currently, welfare benefits are available for the disadvantaged child, the old, and the disabled. Any income available to these groups is onehundred per cent deductible from their welfare funds. In this way, the poor are locked in poverty.

The Solution

The first short range plan must allow some minimum limit to available funds regardless of the status of the father of such families.

A long range plan for the year 1985 will utilize the wealth produced by cybernation. The plan will again set limits below which supplementary funds will be available. Negative income tax will allow more flexibility in the income status.

William J. Hedrick



The ultimate plan will be a guaranteed income. Because of cybernation, unemployment will increase. A new attitude toward the value placed on man's labor for his daily bread will, hopefully, develop. Leisure time will increase and with the increase will come a need for placing new values on non-working activity. A man would be allowed to make his contribution to society in a more creative way assuming he is so inclined. A more equally distributed wealth and the abolishment of poverty will hopefully encourage this inclination.

The Study

Throughout the greater metropolitan area of Raleigh, the public utilities have carried their services to a dynamically oriented population. As people multiply and relocate these services must be adapted to their movement.

The Urban Infrastructures Workshop team has applied itself to studies of the four most prominent systems available: telephone, electric power supply. public water supply, and waste disposal. Each of these systems are constantly up-dating their service and have subsequently managed to meet the needs of the Raleigh community. This high degree of flexibility and system compatibility has discouraged further study in these areas. as the unlimited potentials of each will probably suffice to the year 2000.

The conclusions which can be drawn from utilities systems as generating forces of urban form are as follows: sewage and drainage systems tend to follow creek beds and low elevations. falling from high to low levels on gravity flow principles. The ridge formed by Hillsborough Street is very clearly defined by the sewage lines which fall away from this main thoroughfare. Except for the water supply system, the other utilities systems require relatively small easements and facility spaces. Water storage towers are often unsightly forms on urban landscapes, but this is the only objectionable in a few locations in Raleigh.

URBAN PROGRAMMING

James L. Binkley John B. Carroll John J. Rose O. Darryl Wally

Organization

The Urban Programming and Design Team acted as both coordinator and synthesizer within the workshop, arbitrating disputes between individual teams, co-ordinating individual goals, directing available resources while developing the Raleigh 2000 Plan.

Operations

Each of the various System Teams working independently generated an elaborate set of physical goals and available resources with which to implement these goals. Each of these goals was compared with the entire set of goals by means of the Conflict and Resources Matrix in order to identify conflicts which needed arbitration. The Matrix also served as a depository for the cataloging of available resources which might be used for the implementation of future city development.

Analysis and Synthesis

An analysis of the current zoning structure of Raleigh showed that major transportation routes served as generating forces for commercial and industrial uses. A concurrent analysis of existing land use indicated a fair degree of divergence from the simplicity of zoned uses. In general, it was discovered that expansion patterns were uncontrolled, major recreation areas were inadequately served by public transportation, and that large belts of publicly dedicated land were creating barriers to expansion. particularly to the southwestern,

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western, and northwestern sections of the city. With this foundation the UP and D team began its synthesis while the System Teams were generating their complete sets of goals and were engaged in the design of their individual systems.

From this point onward, the team's activities consisted primarily of setting up constraints to development and of generating a potential decision structure within which development decisions might take place. A growth model for the city was created by incorporating the individual systems teams' decisions into the map mentioned above and by making appropriate trade-offs.

Summary

In trying to identify overriding problems to be faced by our community, we find that they are not different from those of our nation as a whole, problems of natural ecology and pollution, of an uninformed and uninvolved majority, of the emergence of the identity of minority groups.

In Raleigh some issues have assumed dimensions far more critical than the average citizen Among the most imagines. pressing is the complete lack of housing for black families. Due to rigid segregation, movement has been forced ever southeastward, further and further from now marginal public transportation, jobs, shops, desegregated schools. Renewal that has been promised has proven to the blacks upon their examination to be merely the displacing of families by a planned east-west expressway with utterly no provision for rehousing the majority of families. Supply has become so short that black families pay whatever the market will bear in order to be housed in the most inadequate dwelling. Frequently, rents for a slum dwelling run up to five times as much as that which the average white family pays in terms of proportion of income spent for housing.

It must be stressed that a city is not only a complex system of interacting parts but also a delisocial organism, ever cate changing, evolving into new patterns as forces are added to the system. In the coming thirty-one years this community and indeed this society will face stresses to which no other civilization has ever been subjected—a fantastic job-displacing technology, an extraordinarily shrinking world, minorities which are demanding and indeed taking basic rights which a system denies them-in short, a potential social, economic, and political revolution which can be cooled from its already-gathering intensity by immediate compassionate and rational action.

Growth Trends

This map shows some of the operating constraints for developing a general growth model. Generalized residential trends, marked by open arrows, show the growth of housing. Rectilinear cross-hatching shows areas of potential resistance to growth. Light grey indicates existing urbanized areas of Raleigh. By the year 2000 the Beltway which currently skirts the edges of Raleigh's pine tree suburbs will be surrounded by aging residential areas. Also, the existing urbanized area is shown in heavy outline.



Public Land Ownership: Inhibitor or Facilitator of Growth?

Raleigh is unique in its quantity of land dedicated to public use. Three major types are shown here: City lands, mostly contained by the present beltway; state lands, extending in a circular arc from south west to north west Raleigh; and major highway rightsof-way. This pattern strongly suggests that urban growth will be forced northward at rate far quicker than might be expected if westward expansion were possible. Wake County must be prepared for this frontal assault on its open space and utilities systems, otherwise the results could have deleterious effects on a fine landscape.



Utilities Systems

Four systems were studied: Sewage, telephone, electricity and water supply. The sewage disposal system shown here clearly demonstrates the dependence of gravity-flow systems on topography. Hillsborough Street, a ridge in Raleigh's urban landscape, is the line from which all the major trunk sewers fall. While the system seems to serve the residents of the city adequately, studies of soil conditions in suburban areas indicate undesirable percolation characteristics and a subsequent tendency for ground water pollution to occur as new residential neighborhoods are created.



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Health Facilities

These four maps show the changes needed in Raleigh's health facilities by the year 2000. In addition, the map at the upper left hand corner indicates the correlation between health core and income distribution. Area 1 has the highest level of health care and lies in the highest family and per capita income category. Area 3, on the other hand, has the lowest level of health care and also lies in the areas of lowest personal income. Each circle shown on the maps above corresponds to a predicted bed space need for existing or proposed facilities in the future. The smallest circle represents 100 beds, while the largest represents 560 beds.



NORTH CAROLINA ARCHITECT

Health and Welfare

Welfare (upper left and right, lower left): The effect of cybernation is to produce critical job shortages which may be especially acute in the lower-skilled employment areas. Current limits on welfare suggest that, as projected income rises, an income differential will exist causing further problems for the jobless and unemployed. Several devices for bringing incomes into line with projected average incomes are shown here: Raising minimum taxable level, applying negative income tax, introducing guaranteed annual income—all of which are currently feasible, but politically impractical, at the present moment.

Health (lower right): The mobiclinic affords an inexpensive and effective way of bringing health services to people lacking the mobility or motivation to seek it for themselves. For this reason it may be a useful concept in ghetto areas.



Educational Facilities

The rate of change in educational philosophies, concepts and teaching facilities is possibly greater than that of any other major institution. Consequently, any plan based on current standards has doubtful future value. However, if the space standards for teaching areas are accepted then future needs for Raleigh appear as shown here. Whatever the future may bring, Raleigh's educational system will need a major overhaul and expansion in the next thirty years.



Transportation Developments Of The Future

One feasible solution to the city's traffic problems is an interated parking/bus/automobile/express bus facility at the edge of the CBD (upper left). Pictures shown on the lower right indicate the possible high density developments which might take place if this happened. The plans for 1985 and 2000 (upper right and lower left respectively) show predicted growth of major movement arteries, areas of restricted travel near the city core, and potential locations of the integrated facilities mentioned above.



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School As a Community Focal Point The notion that education is something one does only in the first thirty years of life is now obsolete. To survive, man must constantly re-educate himself. Schools will become vital centers of community activity, exceeded only by universities for diversity of cultural and intellectual experiences. This is a conception of the new school. Handsome in style, it fits smoothly into the contemporary residential setting.



NORTH CAROLINA ARCHITECT

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DESIGN SEMINAR III THEME OF NCAIA SUMMER MEETING

Three projects designed by NCAIA members will be featured for discussion at the annual summer meeting of the North Carolina Chapter AIA to be held at the Blockade Runner Hotel, Wrightsville Beach, July 10-11-12. The firm of Oxenfeld and Newkirk, Wilmington architects, will present the planning and development of Figure 8 Island, a vacation area near Wilmington, with a field trip to the site. Other projects to be presented are Sandhills Community College by Hayes-Howell and Associates of Southern Pines and waterfront renewal in Wilmington by Leslie N. Boney, Architect.

The three projects will be explored in depth at a chapter meeting on Friday, 11 July. The field trip to Figure 8 Island will be on Saturday when the developers have invited the entire convention for luncheon there.

In addition to an interesting professional program, a number of social activities have been planned for the convention. A "dinner-on-board" cruise of the Intra-Coastal Waterway is scheduled for Thursday evening. On Friday evening, cocktails on the ocean front patio will be followed by the annual banquet and a hosted dance. Golf, swimming, sailing, water skiing, fishing or just plain loafing will be available each afternoon. Cocktails and informal dancing on the patio are scheduled for Saturday night. Young children will have their own "banquet" and bingo party during the Friday night banquet hour.





NCSU AWARD WINNERS

MOFFETT

HEACOCK

Kenneth Moffett, a fifth year architectural student in the School of Design at N. C. State University has been awarded the 56th Paris Prize in Architecture. This is the most prestigious academic award in American Architecture. Moffett will receive \$5,000 in cash to be used for a year of foreign travel from the National Institute for Architectural Education of New York City.

Moffett will receive the Bachelor of Architecture degree from NCSU on May 31. The faculty of the School of Design recently awarded him the American Institute of Architects' School Medal for being the first ranking student in his class of 50. He is also a recipient of the 1968 foreign student exchange award for work in Europe last summer which was sponsored by Wheatley and Whisnant Architects of Charlotte. Moffett is a member of Phi Kappa Phi National scholastic honorary fraternity and during 1967-68, he was co-editor of the Student Publication of the School of Design.

Scott Heacock, a fourth year architectural student in the School of Design at N. C. State University is one of the eight winners of the Portland Cement Architectural Scholarship Awards Program for student architects in the U. S. and Canada. He will leave June 26 for a summer of study at the Fontainebleau School of Fine Arts near Paris, France.

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INCIDENTALLY . . .

U. S. Secretary of Defense Melvin R. Laird has named Leslie N. Boney, Jr., FAIA, a member of the Joint Civilian Orientation Conference which is now in progress. Boney was one of 70 civilians selected by Secretary Laird to form this year's committee. Among other things, they will visit USS Constellation at sea, a Strategic Air Command base, the North American Air Defense Command in Colorado Springs, Eglin Air Force Base, Fort Benning and Camp Lejeune in this state. The purpose of this committee is to make it possible for key professional men to study the accomplishments and problems of the Department of Defense and to make available to Americans as much information as possible MacMillan, MacMillan, Shawcroft & Associate announce the opening of their offices for the practice of architecture at 616 West Johnson St., Raleigh G. Donald Dudley, AIA, formerly associated with the firms of McMinn, Norfleet & Wicker and Robert E. L. Peterson, announces the opening of an office at 3132 Battleground Ave., Greensboro Betty W. Silver has been appointed as an Executive Director of the NCAIA





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CALENDAR OF EVENTS

- June 22-26: National AIA Convention, Palmer House, Chicago, III.
- July 1: Durham Council of Architects, Durham Ho-Aug. 5: tel, 12:30 P.M., Sam Hodges, AIA, President
- July 2: Charlotte Section, NCAIA, Charlottetown Aug. 6: Mall Community Hall, 12:30 P.M., Sherman Pardue, AIA, President.

July 3: Raleigh Council of Architects, YMCA, Aug. 7: 12:15 P.M., Horace Taylor, AIA, President.

- July 10-12: North Carolina Chapter AIA, Summer Meeting, Blockade Runner Hotel, Wrightsville Beach.
- July 21: Winston-Salem Council of Architects, Aug. 18: Twin City Club, 12:15 P.M., Lloyd G.
- Walter, Jr., AIA, President.
- Aug. 8: Eastern Section NCAIA Meeting, Wilmington.

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