

HEUSE RIVER BASIN DEVELOPMENT

Architectural Thesis Report

May 1966

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NEUSE RIVER BASIN DEVELOPMENT

Emergence of problem:

The Research Triangle Region shows great growth potential in the immediate future. The Region is situated entirely within the Piedmont section of North Carolina. In fact, Wake County's eastern border marks the beginning of the Coastal Plain. The Triangle Area is the eastern terminus of the highly prosperous Crescent Corridor. Concentrated within this narrow strip is one-half of the state's people and a large portion of the business, industrial, and major institutional activity of the state. If present trends continue, the district urban centers of this Crescent Corridor will merge into a single metropolitan strip two hundred or so miles long. The disadvantages of this type of end product can now be seen taking shape in different regions of the United States. A metropolitan strip now stretches almost unbroken from Northern Virginia to Boston. Similarly, the stretch of the country from Minneapolis-St. Paul through Chicago to Cleveland; the Southern California coast from near the Mexican border to north of Los Angeles; and other metropolitan stretches of the nation show similar distasteful results of over-expansion of existing systems of cities. Therefore, existing urban cores already strained to their capacity should be supplemented by distinct subcenters planned for ordered growth economically feasible. In this manner the present crescent urban cores would be prevented from merging into each other through usual peripheral growth. Whether or not the North Carolina Crescent Corridor, or the Research Triangle Region for the sake of a smaller and more manageable scale, will be a desirable place in which to live depends upon the structure given to its future development.

The three counties in the Region—Wake, Durham, and Orange counties— show net gains in population whereas most of the surrounding counties, except for those to the west, show net loses. Wake, Durham, and Orange counties are three of the ten counties in North Carolina that have an in-migration of young adults. They all register a major increase in public school enrollment. Thus the Research Triangle Region of three counties is an area of high anticipated population growth.

The land use survey of the Research Triangle Region reveals that if present patterns of development continue, large amounts of the population will spread out in a scattered manner across the landscape, generally following the road system. The population estimates show that the 1960 figure of 325,000 people in the Research Triangle Region will increase to between 450,000 to 575,000 by the year 1980. The housing need for this increase in population will require approximately 25,000 additional acres of land if present housing trends continue. Even though the region has more than adequate land to fulfill this projected demand, the cost of present patterns of development to the homeowner, the commuter, the taxpayer, and to units of government will be high and efficiency will be low in terms of public services. This further illustrates the growing need for change in the structure of housing communities.

The Research Triangle Area is well interconnected by a network of state and federal roads. A large part of Raleigh and Durham's present work force commutes from surrounding areas. Durham County receives 15 percent of Orange County's employees and 5 to 10 percent of Granville's employees. Wake County, especially Raleigh, receives 18 percent of Johnston County's, 18 percent of

Franklin County's, and 5 to 10 percent of Harnett County's employees.

Both Wake and Durham Counties have a much more stable work rate than the surrounding counties, due to the fact that they are low agricultural areas in comparison to neighboring counties. Wake County has very high white collar workers and very low blue collar and farm workers in proportion to the state average. Wake County workers have very high income averages as compared to the state as a whole. Durham urban center has a high number of both white and blue collar workers. Durham County is above the state average for family and per capita income. These trends are somewhat reversed for most adjacent counties to the north, east, and south of the Research Triangle Area. Also, relative to deprivation, this three-county area contrasts very favorably to most surrounding counties.

Wake County, containing capital and governmental centers of the state, presents quite an urban scene to the area. Its high proportion of white collar workers is largely due to the presence of the state capital and its associated governmental offices as well as a number of service businesses which have grown up around this governmental complex. Wake County has gained in number of employed males at well above the state rate of gain. Wake County is well below the state rate for sub-standard housing and well above the state average. As mentioned before, Wake County has gained heavily through the migration of young adults and has also gained in public school enrollment at over twice the state rate of gain.

It has been established from preceding statements and the present housing market of the area that Wake County's citizens demand high quality housing.

The housing demand created by new migrations should be fulfilled with more advantageous types of housing. If new housing types offer improvements over the standard detached-house developments, they will be accepted by these young adults.

The Falls Lake area is a desirable location for future housing developments serving the Research Triangle Region. A major portion of the regions expected increase in population could be housed here. The Research Triangle Regional Development Plan for 1980 shows that if the expansion of Raleigh-Durham continues in the direction of the proposed lake, the region's best agricultural land, which is to the east and south of Raleigh, will remain less intensively developed. The major industrial sites of the region are also outside the immediate vicinity of the lake site. In addition, the lake area is in proximity to the region's major urban centers and offers high recreational values.

The proposal by the Federal Government of the Falls Lake on the Neuse River Basin presents an opportunity for comprehensive development of a large area. In anticipation of the lake, subdivision developments spreading north of Raleigh have skipped to this area. Recreational facilities and guarantee of land value increase have already led to land speculation in the Neuse River Basin.

In order that the Falls Lake area be developed to its utmost potential, control under a single authority is necessary. The presently infringing development with disregard for the area as a whole should be stopped, and a regional authority should have control over the total area land use and the type and design of development.

NEUSE RIVER BASIN DEVELOPMENT

Statement of problem:

As a result of compiling of facts, research of and familiarization with the potentials of the Research Triangle Area, a definite need has arisen to develop a system of lake area communities in the Neuse River basin. This system will be a multiple of a basic community unit. The basic unit will be a solution applicable to all parts of the lake area flexible enough to cope with the particular requirements of any specific site. Following the design of the basic community unit and the total lake area system, a more detailed development of a unit for one particular site will be proposed.

NEUSE RIVER BASIN DEVELOPMENT

Restrictions:

The restrictions set for the problem are based on the material supplied by the Research Triangle Regional Planning Commission. This material consists of the Research Triangle Region General Development Plan for 1980 and its accompanying report, individual contacts with John G. Scott, Senior Planner, Research Triangle Regional Planning Commission, and various maps and aerial photographs of the region.

The restrictions are as follows:

1. Location of the lake.
2. The boundary of the land strip along the entire lake shore that will be owned by the Federal Government, with lake access rights for adjacent property.
3. Present and proposed land use for the Research Triangle Region.
4. The present and proposed areas for industrial expansion and the region's urban centers will provide adequate employment opportunities for the residents of the lake area.
5. Location of existing and proposed roads serving the area.
6. The automobile will remain the dominant means of transportation for the region. Development of regional rapid transit facilities will not be feasible in the immediate future.
7. Assumption of the availability of public water and sewerage facilities at any point in the lake area.
8. Location of the suggested natural wildlife reserves and public park facilities.
9. Proposals for detailed development will be confined to the Wake County portion of the lake area since studies are more complete for Wake County.
10. The goal is to work toward a desirability plan for the lake area as opposed to a feasibility plan which would be enacted under the present political, economical, and social framework.

NEUSE RIVER BASIN DEVELOPMENT

Design Approach:

The design approach for the system of lake area communities was in the form of a series of objective studies. These studies began by establishing a number of prime importances and a hierarchy within these importances. The prime importances at the outset of problem analysis were as follows:

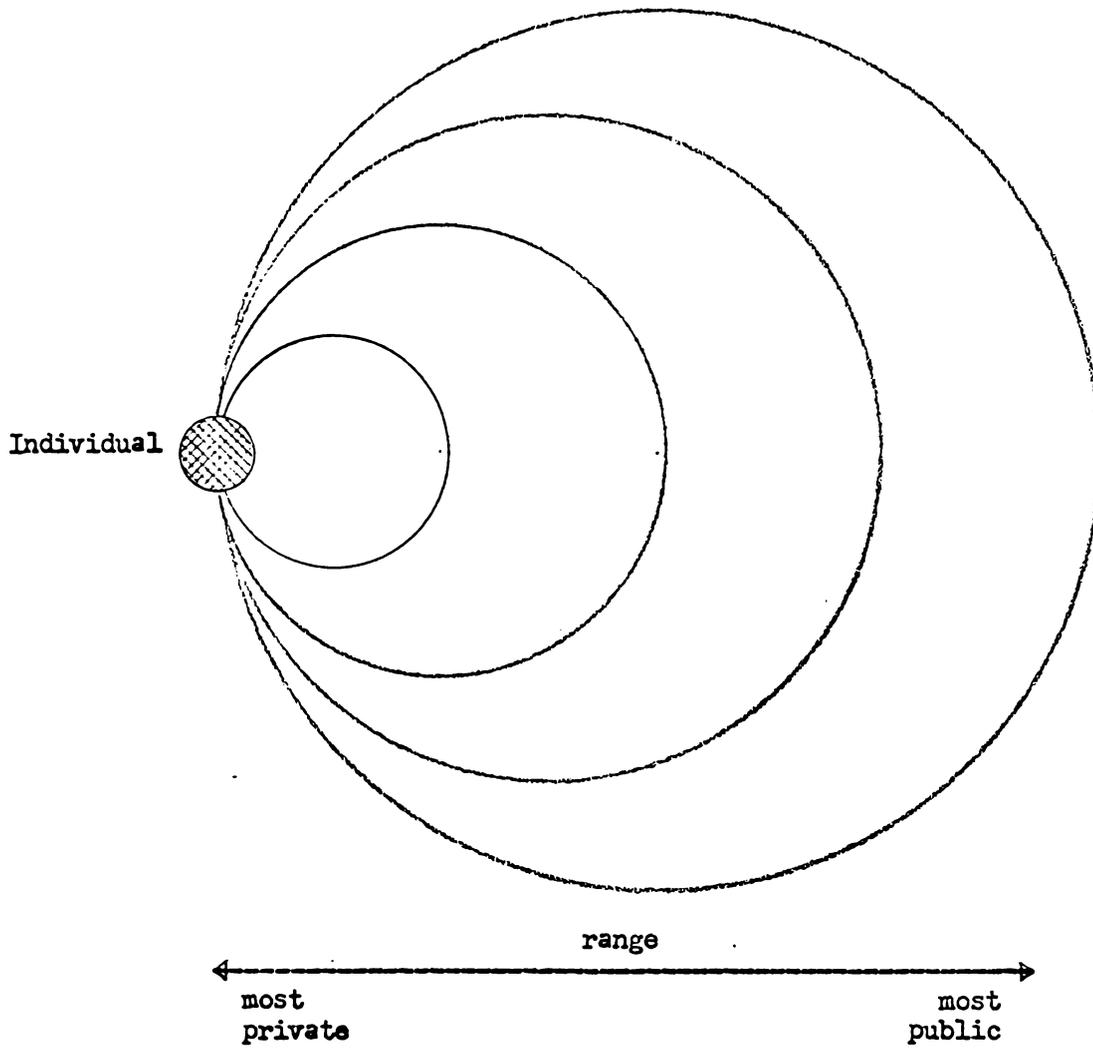
1. Hierarchy of Social Domains
2. Hierarchy of Change
3. Hierarchy of Movement
4. Hierarchy of Time Cycles

Analysis of these initially established prime importances constituted a basis for design decisions while also leading to the discovery of other importances as the studies progressed. These analyses are as follows:

I. HIERARCHY OF SOCIAL DOMAINS:

One of the basic requirements within this hierarchy was the establishment of how an individual would relate within the social domains. This was called the Individual's Social Relatedness, which states that an individual should be able to relate directly to any level of social activity-the range being from his most private domain to the most public elements of the community system. This is explained by the following diagram:

INDIVIDUAL'S SOCIAL RELATEDNESS



The elements of the hierarchy of social domains are as follows:

I. HIERARCHY OF SOCIAL DOMAINS:

"Own" Room

- corridor
- storage areas
- HOUSE - bathrooms
- utilities
- special areas
- common room

Organization of Rooms (House)

- exterior zone
- path
- mail delivery
- CLUSTER - garbage collection
- fire service
- utilities control
- emergency service
- parking and drives

Cluster Organization

- road
- playground
- laundry
- NEIGHBORHOOD - cluster facilities
- boat houses
- visitor parking

Neighborhood

- street
- GROUP - nursery
- playground, open areas
- small commercial

Group of Neighborhoods

- COMMUNITY
- town marina
 - major commercial
 - elementary schools
 - town hall
 - post office
 - fire department
 - medical clinic
 - transportation exchange
 - theatres
 - parking facilities
 - service stations
 - churches
 - offices
 - banks
 - galleries
 - sports facilities
 - parks

Community

- SYSTEM
- highway connections
 - future rapid transit
 - stadium
 - consolidated high school
 - major marinas
 - natural reserves
 - lake facilities
 - large public parks
 - hospital

System of Communities

II. HIERARCHY OF CHANGE:

The hierarchy of change was established through the recognition of different life cycles of elements. The range of life cycles of elements vary from most permanent to least permanent. The relationship of most private- least private, least permanent- most permanent was utilized through the rearrangement of elements

within the social domains. This rearrangement of elements from least permanent (most private) to most permanent (least private), is shown as follows:

II. HIERARCHY OF CHANGE:

- HOUSE
 - personal room
 - special areas
 - bathrooms
 - kitchen
 - utilities
 - common rooms
 - corridors
 - **reception**

- CLUSTER
 - exterior zone, transition
 - path
 - delivery service area
 - mail delivery
 - garbage collection
 - utilities control
 - fire service
 - parking area and drive
 - pedestrian area and trail
 - emergency service area

- NEIGHBORHOOD
 - laundry
 - neighborhood facilities
 - play yard
 - visitor parking
 - road
 - pedestrian
 - automobile

- GROUP OF NEIGHBORHOODS
 - nursery
 - recreational facilities
 - playground, open areas
 - restaurant
 - small commercial
 - parking
 - street
 - pedestrian
 - automobile

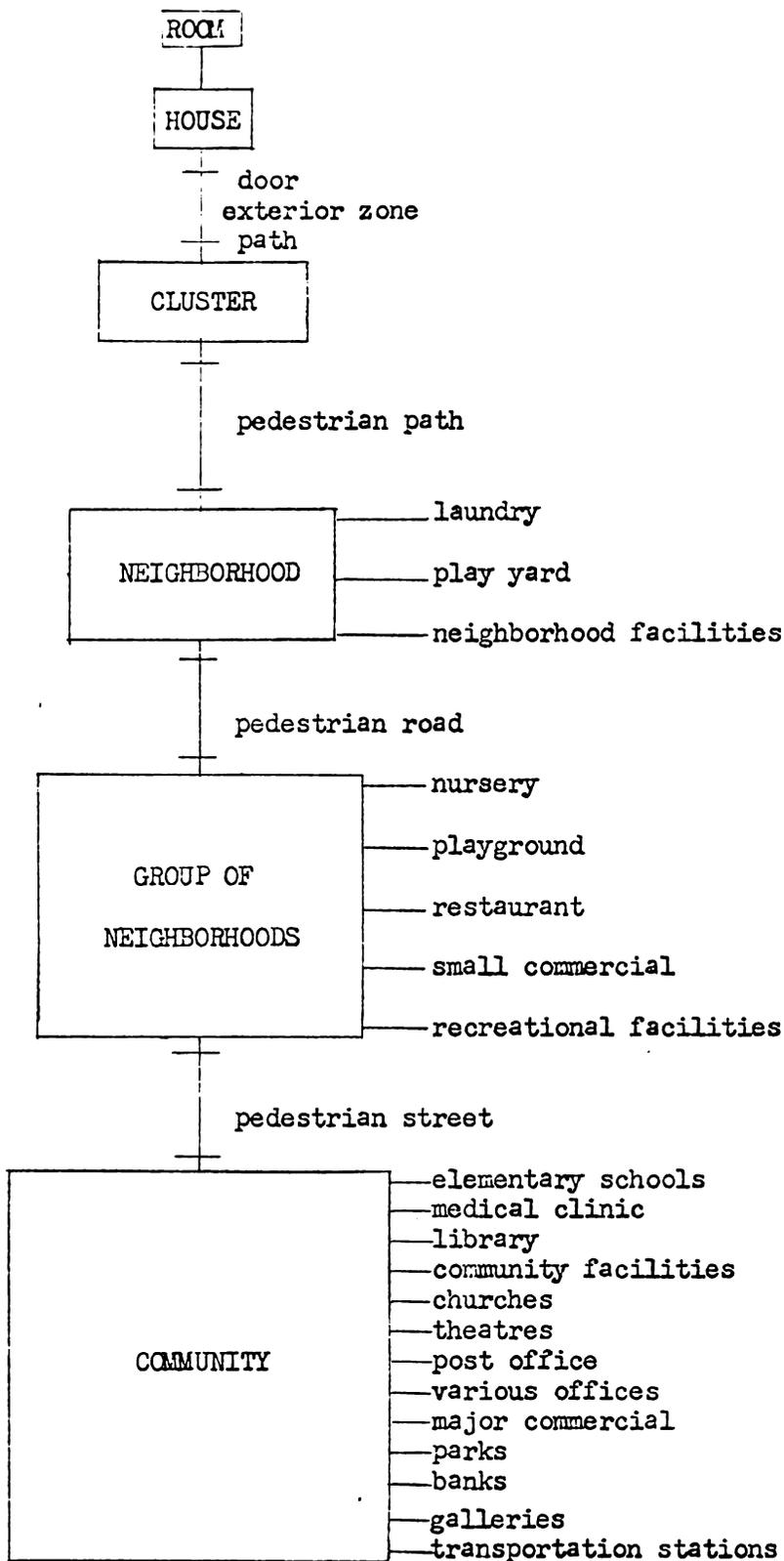
- elementary schools
- medical clinic
- library
- fire department
- various community facilities (marina, etc.)
- churches
- banks
- offices
- post office
- COMMUNITY - theatre
- gallery
- major commercial
- sports facilities
- parks
- pedestrian areas
 - streets
 - malls, etc.
- public parking
- service stations
- transport exchange
- highway system

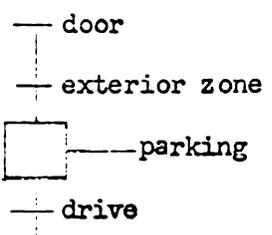
- consolidated high school
- hospital
- major playgrounds
- SYSTEM - stadium
- OF - motels and hotels
- COMMUNITIES - natural reserves
- major marinas
- large public parks
- future rapid transit
- highway connection system (expressways)

III. HIERARCHY OF MOVEMENT:

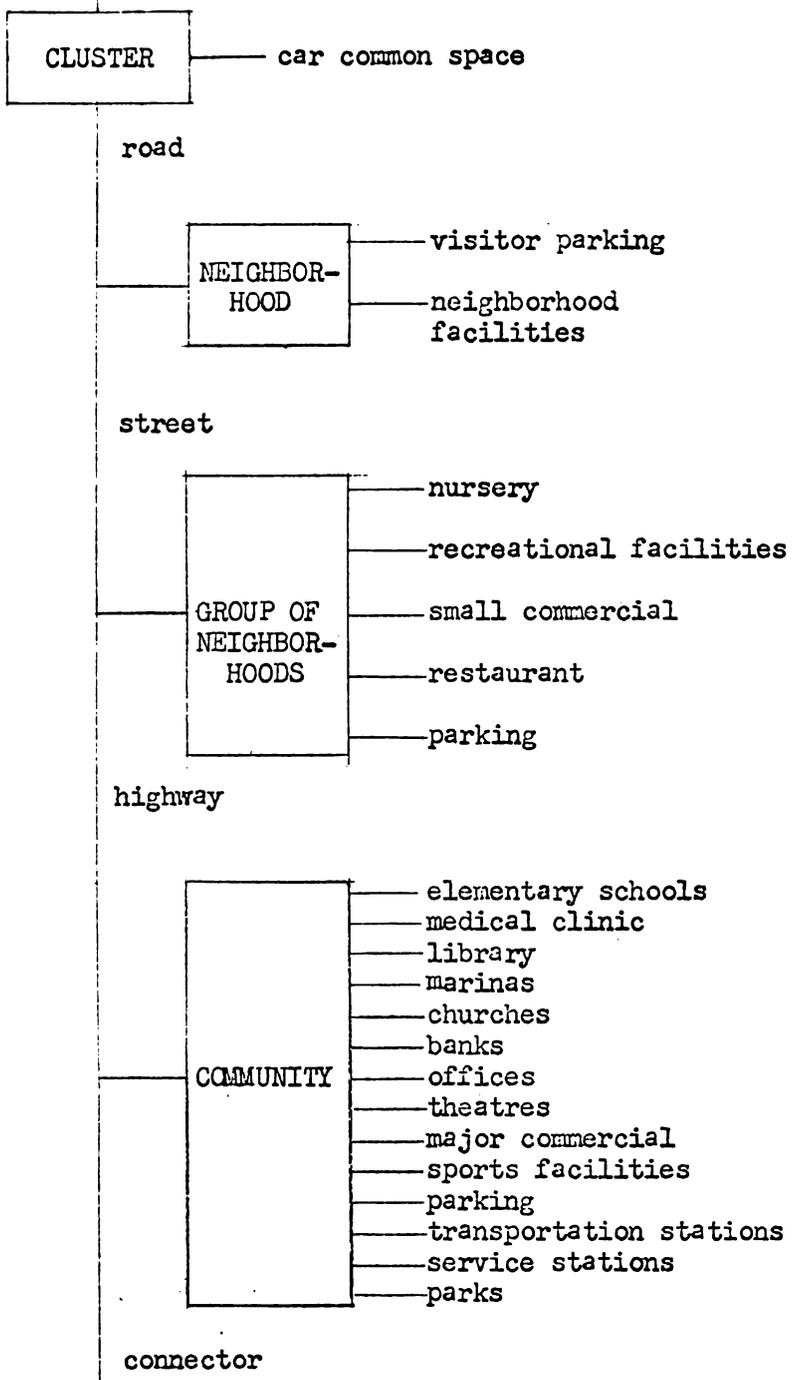
Movement within each domain and within the total system was ordered in terms of the following cycle: destination---transition---link---transition---destination.

A hierarchy of movement analysis was made for the pedestrian, automobile and services moving through all domains shown in the following diagrams A, B and C.

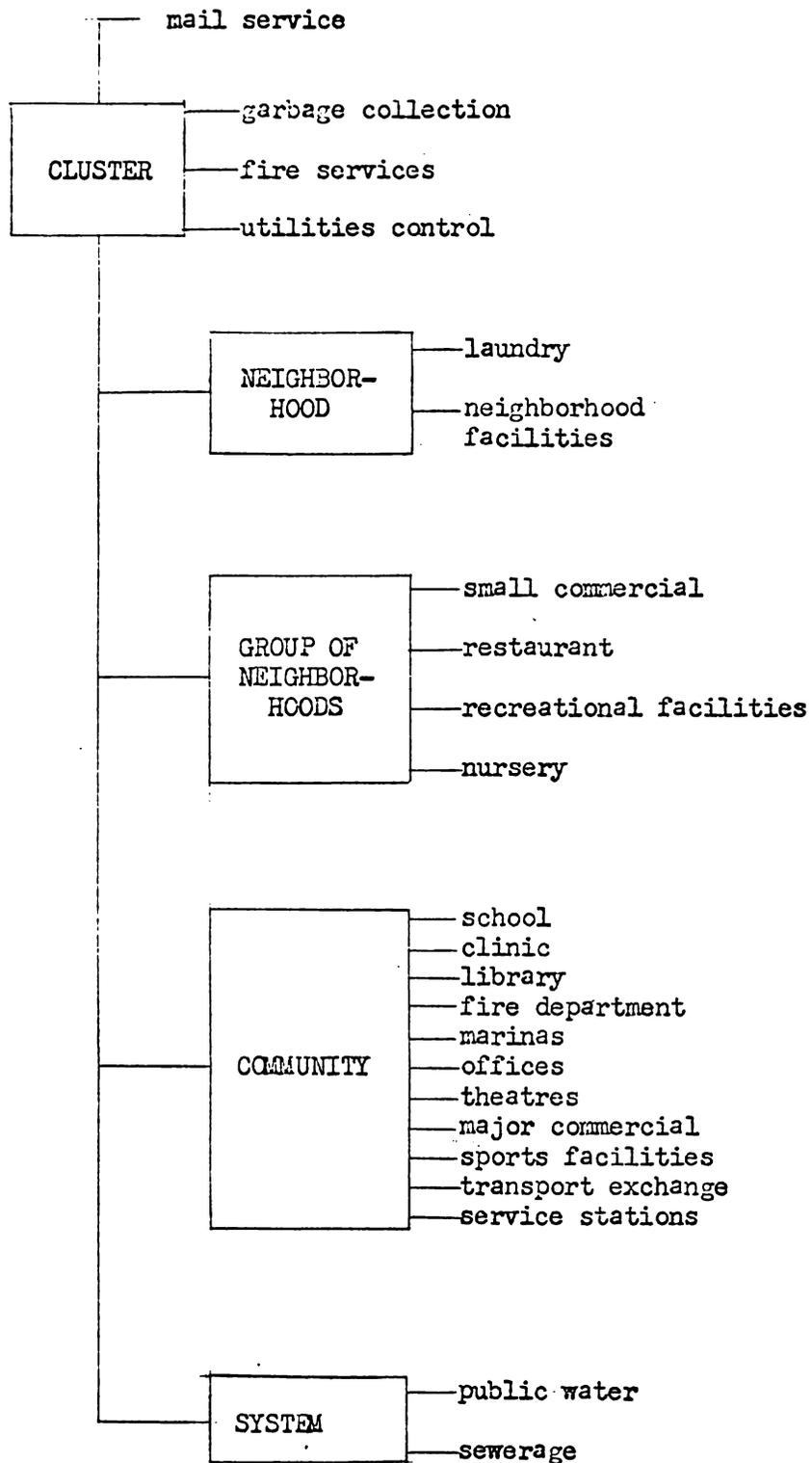
A. Pedestrian:



B. Automobile:



SYSTEM expressway and future rapid transit

C. Services:

IV. HIERARCHY OF TIME CYCLES:

The realization that social activities fall into time cycles in terms of use, has led to the analysis of these cycles as moment, day, week, season. Elements within the social domains were categorized in each time cycle according to repetition of use and according to peaks as follows:

IV. HIERARCHY OF TIME CYCLES:

Moment: (always in use)

- expressways- highways
- rapid transit
- lake facilities
- hospital
- stations
- public parking
- service stations
- pedestrian areas
- fire department
- laundry
- emergency service area
- private parking
- emergency service
- delivery service
- house facilities

Day

morning (8-11 A. M.) peak hour 8 A. M.

- expressways, highways
- rapid transit
- high school
- stations
- public parking
- pedestrian
- services to the house (mail, garbage, utilities control)
- nursery
- medical clinic
- galleries
- offices
- banks
- library

noon: (11 A. M. - 2 P. M.) peak hour 12 noon

- high schools
- public parking
- major commercial
- library
- banks
- restaurant
- nursery

afternoon: (2-5 P. M.)

- high schools
- public parking
- major commercial
- galleries
- theatres
- banks
- library
- medical clinic
- nursery

evening: (5-8 P. M.) peak hour 5 P. M.

- expressways, highways
- rapid transit
- stations
- pedestrian
- theatres
- restaurant
- small commercial

night:

- stadiums
- theatres
- restaurant
- visitor parking
- house

Weekweekdays: Monday- Friday

- expressways, highways
- rapid transit
- high school
- stations
- library
- offices
- banks
- clinics
- restaurants
- nursery
- playgrounds
- services to the house

weekends: Saturday- Sunday

- lake facilities
- stadiums
- major recreational facilities
- major commercial
- galleries
- theatres
- church
- restaurants
- visitor parking
- house

Seasonspring:

- large public parks
- major playgrounds
- high schools

summer:

- lake facilities (marinas)
- large public parks
- major playgrounds

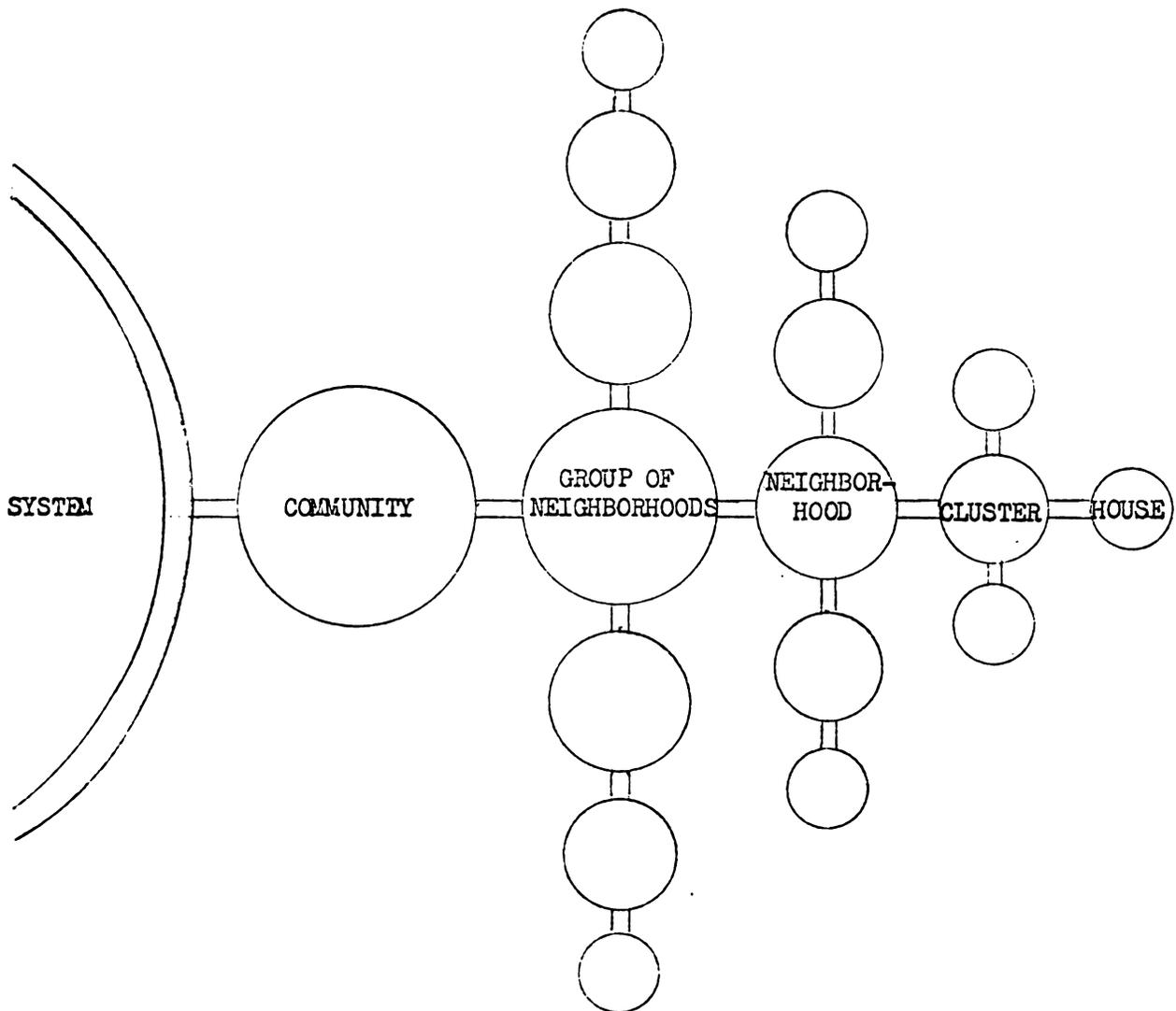
autumn:

- large public parks
- stadium
- major playgrounds
- high schools

winter:

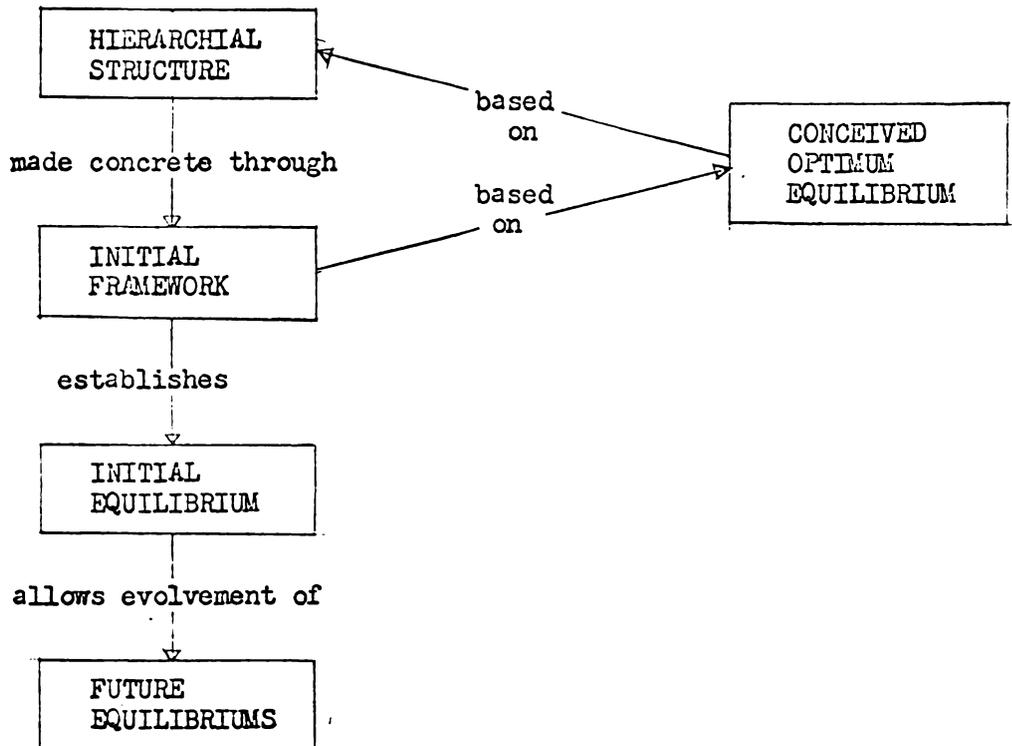
- stadium
- high schools
- galleries
- theatres
- library
- house

The above analysis of the four hierarchies lead to the basic community unit hierarchial structure as shown in the diagram below:



The hierarchial structure of the basic community unit is made concrete through an initial framework. This initial framework will be based on fulfilling the requirements of a conceived optimum equilibrium. This initial framework will establish an initial equilibrium while allowing for the evolvement of future equilibriums. The hierarchy of change with the recognition of a range of life cycles of objects from long-lived to short-lived provides for this evolvement to future equilibriums.

The following diagram illustrates this principle:



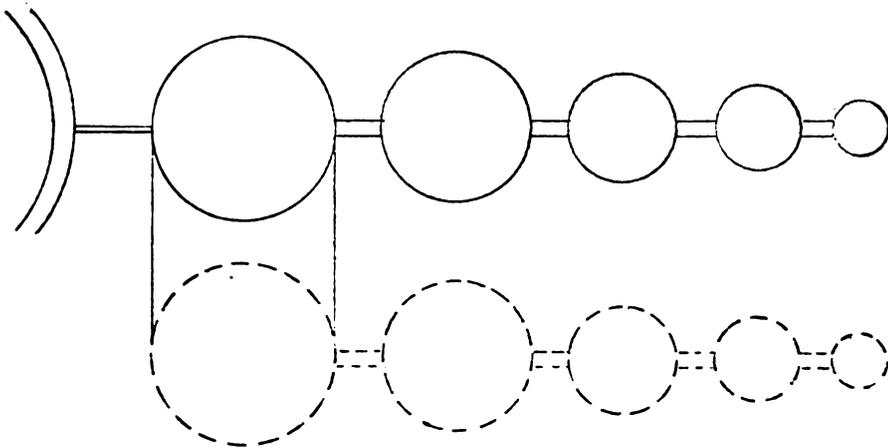
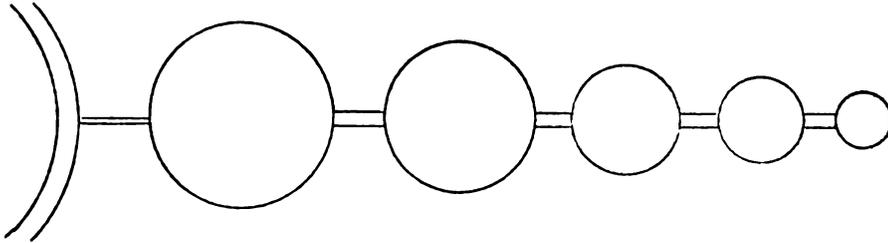
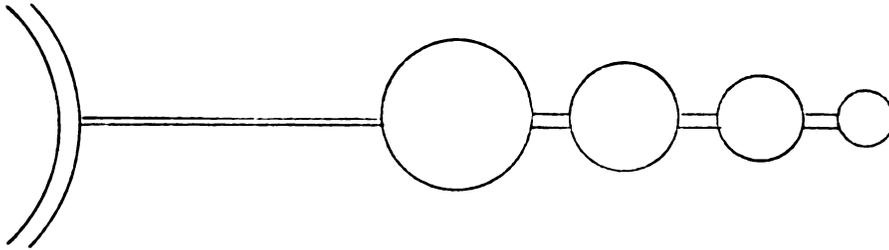
The environmental ecology of the basic community unit will be that of one contrived to support any desired number of inhabitants. The only limit will be that of the cost involved, or economic feasibility. This contrived ecology of the urban center will be independent of the natural ecology in its immediate surroundings. That is, these urban areas will have an artificial metabolism. In this way, the desirability of the area as a place to live will not be destroyed during the process of its growth. Therefore, the number of people accommodated in the area will not be dependent upon the capacity of the area for development in terms of usual practices, but upon the desirability to accommodate any number of people on a particular site.

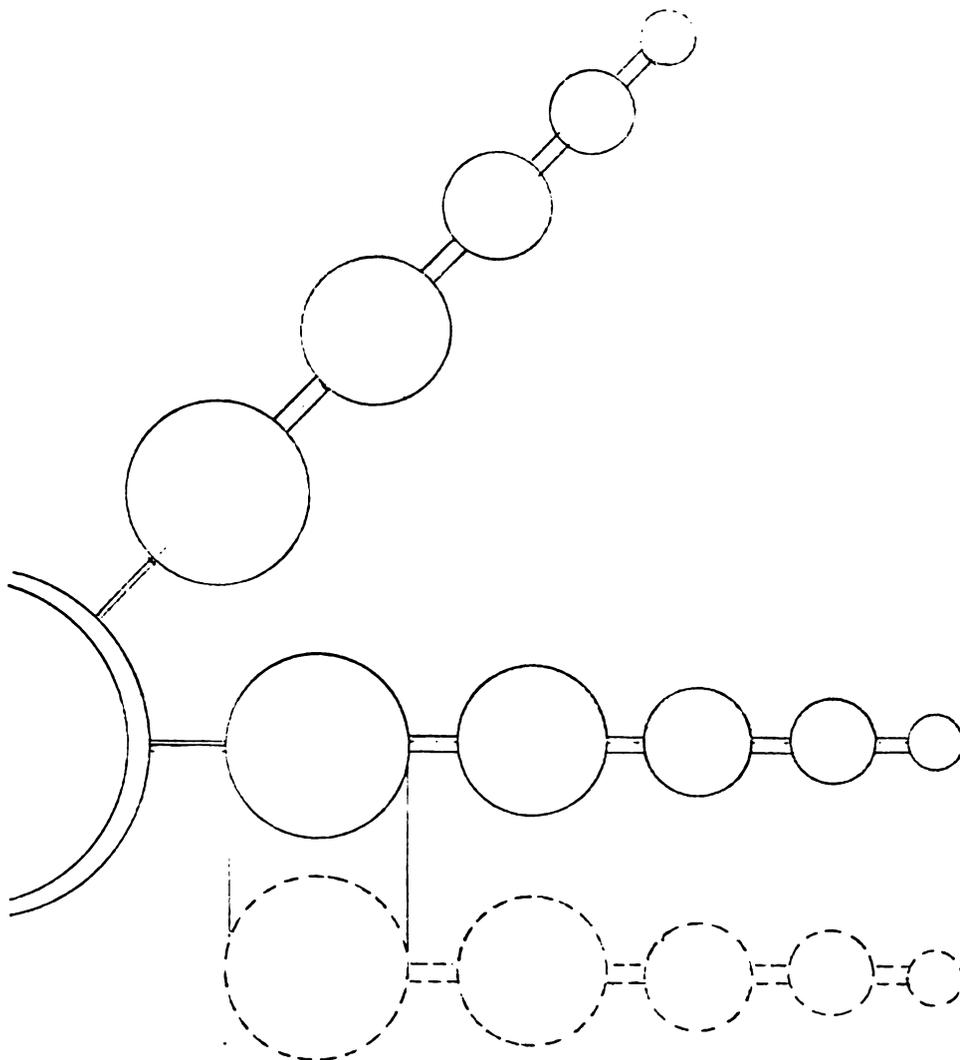
The system of lake area communities will be composed of a number of basic community units plus certain overall system facilities connected by public transit. The mass transit connections initially will be expressway and motorway with rapid transit seen for the more distant future.

Growth within the total system of communities will be one of linear expansion of a single unit or the attachment of a new community unit to the total system. The limit to which one community unit could grow will be determined by economic feasibility and site restrictions, and could stop at any level of its hierarchial structure. The growth of the unit could continue until the hierachy is complete. This community could expand linearly by the attachment of new units. Also a new isolated community unit could attach itself to the total system. As more units get attached to this total system new facilities can be supported and will be

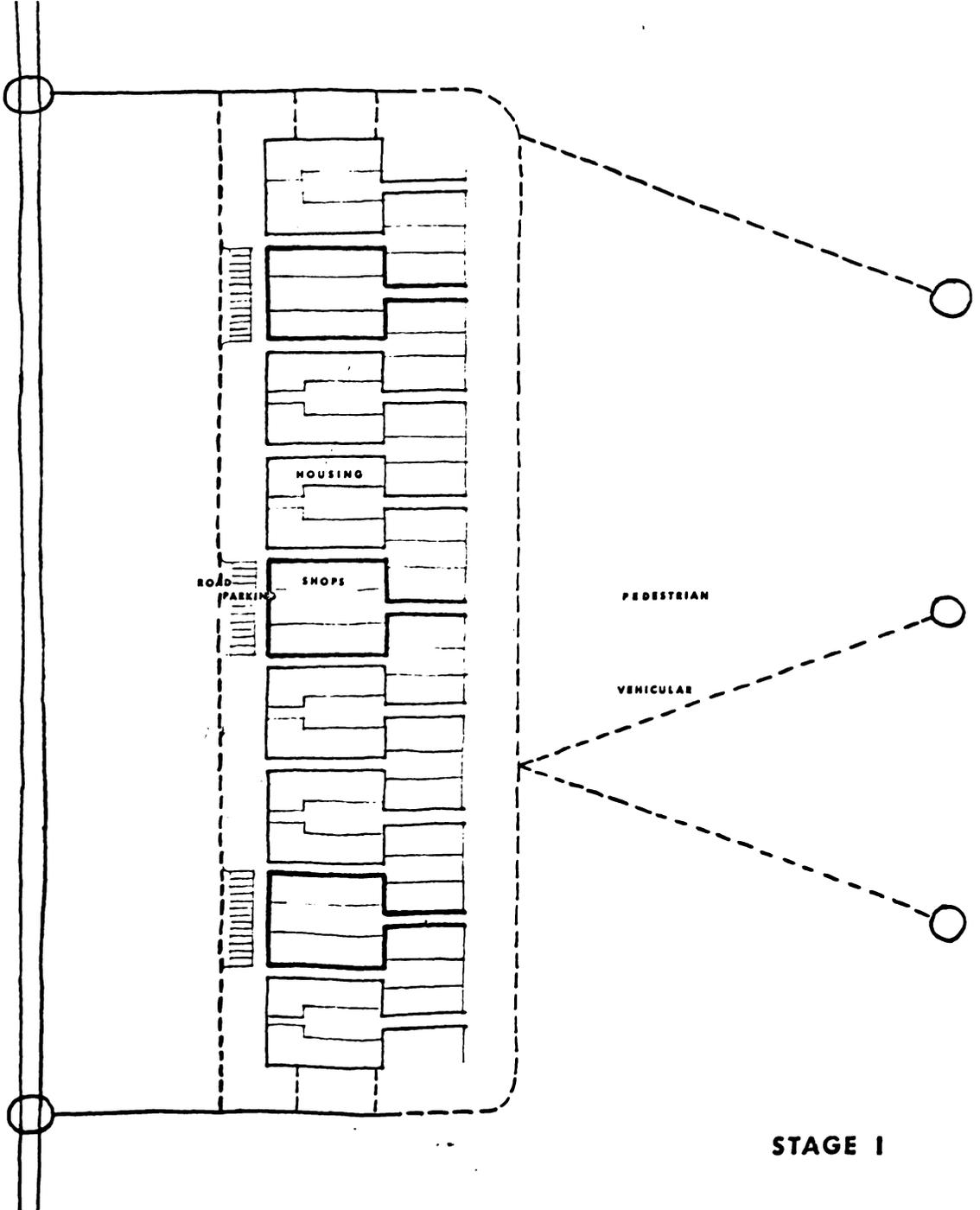
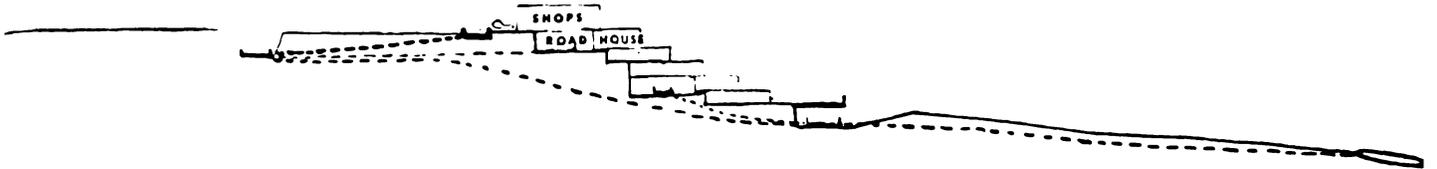
developed at strategic points within the system.

The following diagrams illustrate the growth patterns of the system:

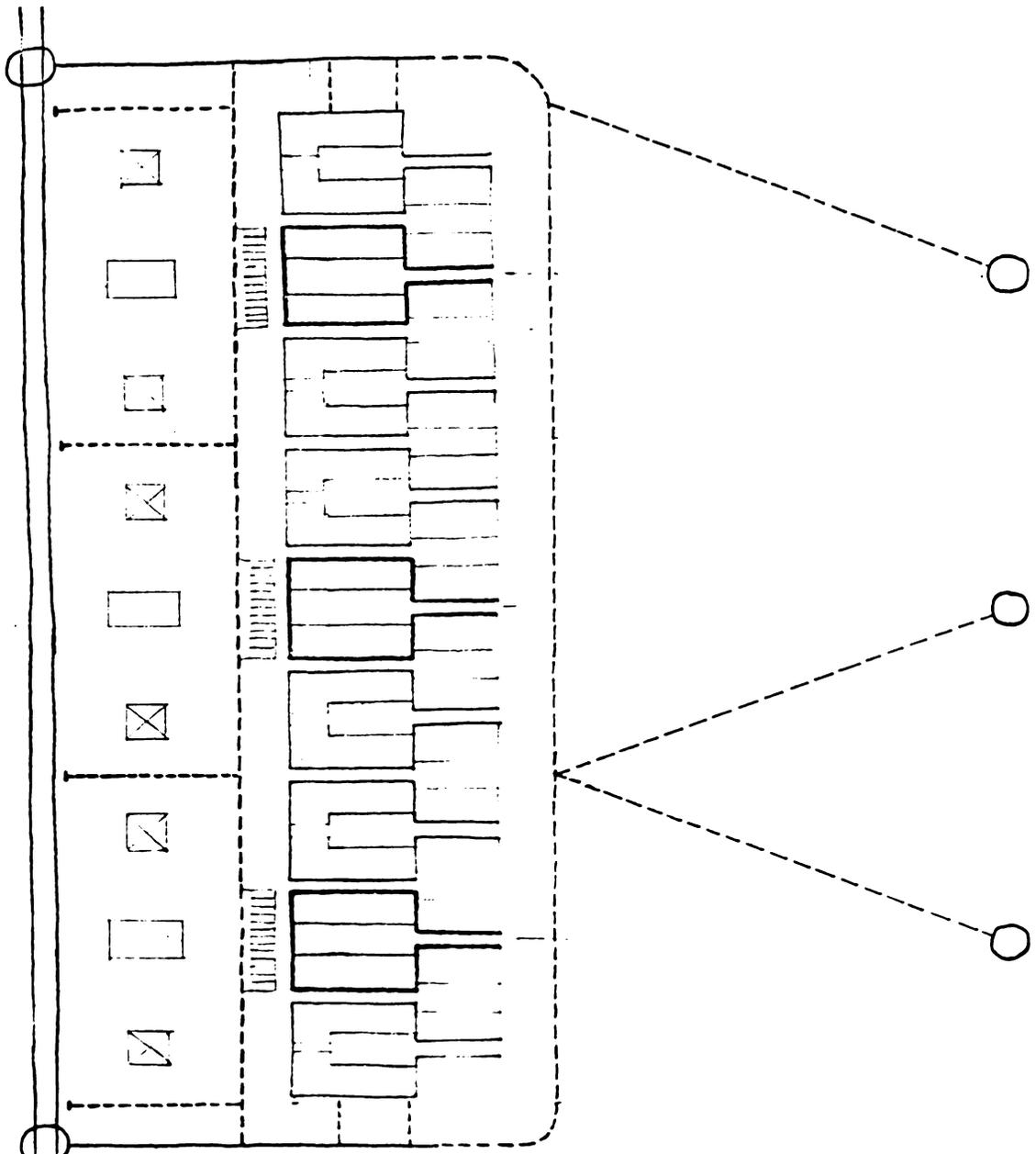




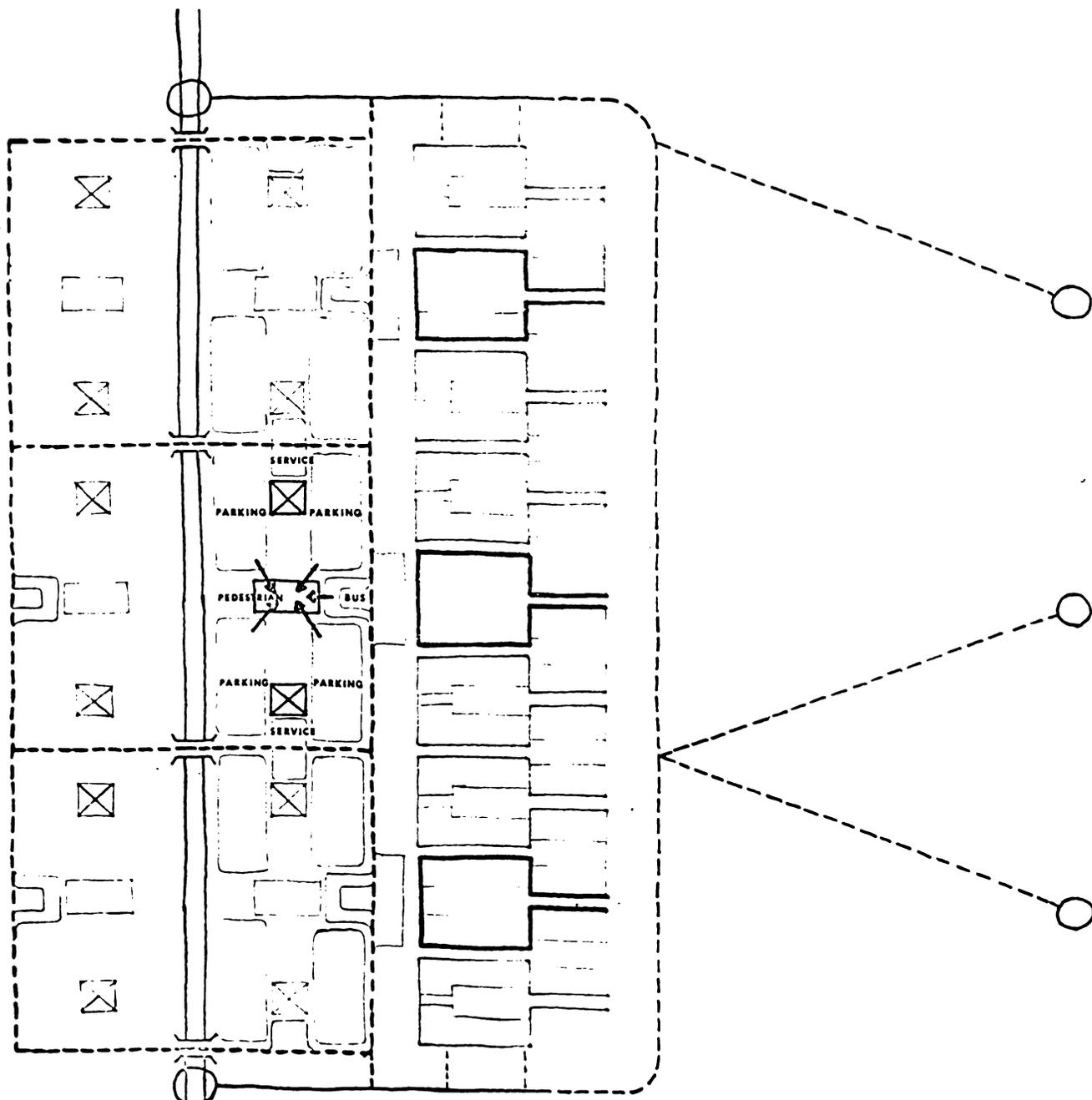
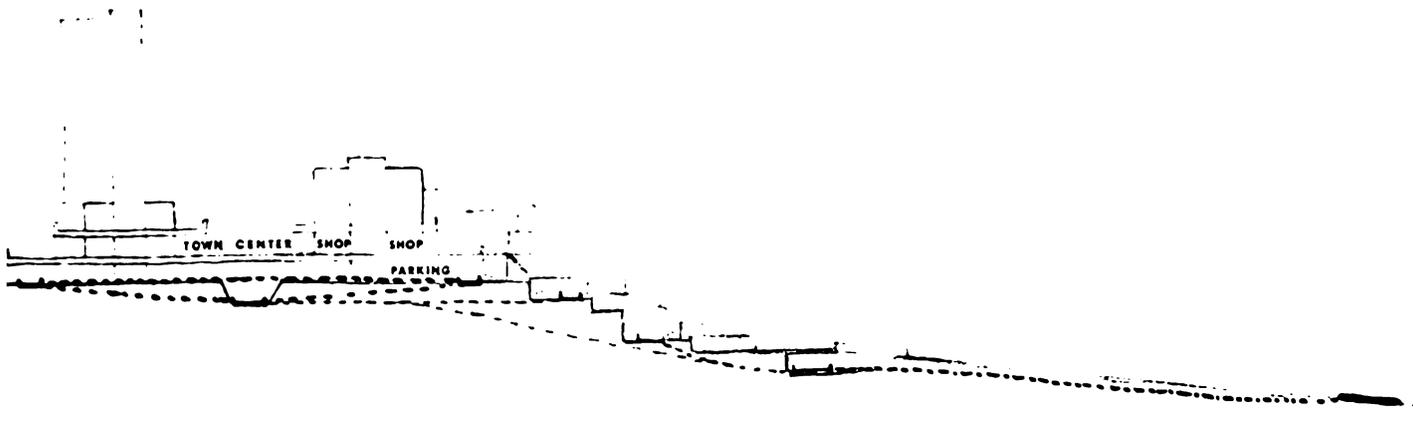
The community center itself could be developed in a number of stages as economically feasible. The following diagrams illustrate three stages of development from a small community to an urban center.



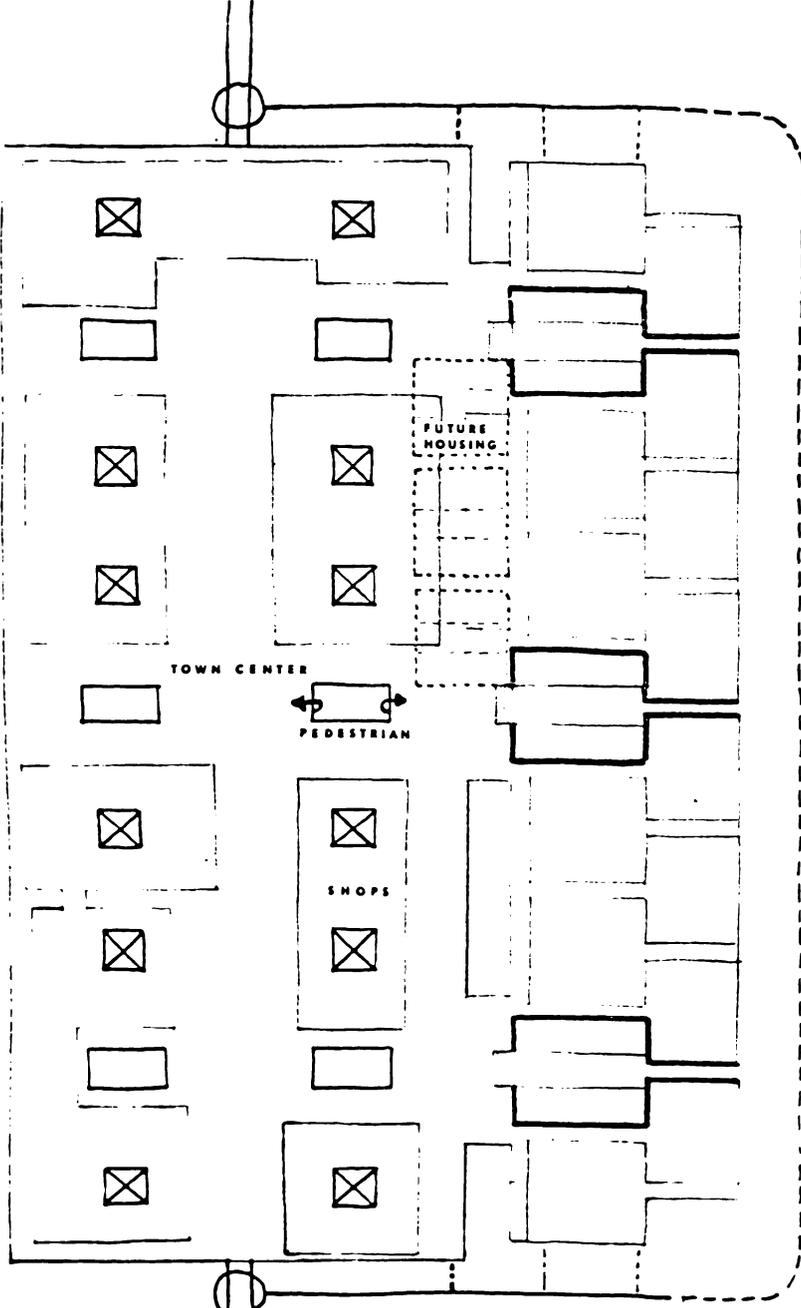
STAGE I



STAGE II



STAGE III



PEDESTRIAN LEVEL