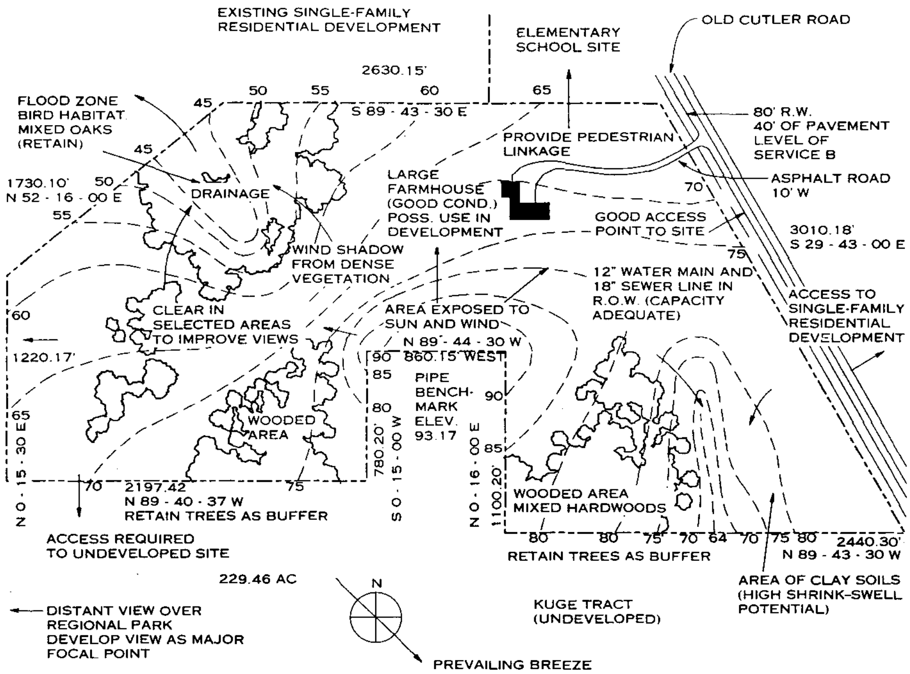


TOPOGRAPHICAL SURVEY

SURVEY DATA

The first step in any site analysis is the gathering of physical site data. An aerial photograph and an accurate survey showing the following information are basic to any site analysis process:

1. Scale, north arrow, benchmark, and date of survey
2. Tract boundary lines
3. Easements: location, width, and purpose
4. Names and locations of existing road rights-of-way on or adjacent to the tract, including bridges, curbs, gutters, and culverts
5. Position of buildings and other structures such as foundations, walls, fences, steps, and paved areas
6. Utilities on or adjacent to the tract—location of gas lines, fire hydrants, electric and telephone poles, and street lights; and direction, distance to, and size of nearest water mains and sewers and invert elevation of sewers
7. Location of swamps, springs, streams, bodies of water, drainage ditches, watershed areas, flood plains, and other physical features
8. Outline of wooded areas with names and condition of plant material
9. Contour intervals of 2 to 5 ft, depending on slope gradients, and spot elevations at breaks in grade, along drainage channels or swales, and at selected points as needed

Considerable additional information may be needed, depending on design considerations and site complexities such as soil information and studies of the geological structure of the site. Federal regulations for wetland mapping and conservation may also be relevant.

SUBURBAN SITE ANALYSIS

The site analysis is a major responsibility of the site planner. The physical analysis of the site is developed primarily from field inspections. Using the survey, the aerial photograph, and, where warranted, infrared aerial photographs, the site designer, working in the field and in the office, verifies the survey and notes site design determinants. These should include, but not be limited to, the following:

1. Areas of steep and moderate slopes
2. Macro- and microclimatic conditions, including sun angles during different seasons; prevailing breezes; wind shadows; frost pockets; and sectors where high or low points give protection from sun and wind
3. Solar energy considerations. If solar energy appears feasible, a detailed climatic analysis must be undertaken considering factors such as detailed sun charts; daily averages of sunlight and cloud cover; daily rain averages; areas exposed to the sun at different seasons; solar radiation patterns; and temperature patterns
4. Potential flood zones and routes of surface water runoff
5. Possible road access to the site, including potential conflicts with existing road systems and carrying capacities of adjacent roadways (usually available from local or state road departments)
6. Natural areas that from an ecological and aesthetic standpoint should be saved; all tree masses with name and condition of tree species and understory planting
7. Significant wildlife habitats that would be affected by site modification
8. Soil conditions relative to supporting plant material, areas suitable for construction, erosion potential, and septic tanks, if relevant
9. Geological considerations relative to supporting structures
10. Exceptional views; objectionable views (use on-site photographs)
11. Adjacent existing and proposed land uses with notations on compatibility and incompatibility
12. Potential noise sources, particularly noise generated from traffic that can be mitigated by using plants, berming, and walls and by extending the distance between the source and the receiver

URBAN SITE ANALYSIS

Although much of the information presented for suburban sites may apply equally to urban sites, additional site design criteria may be necessary. The urban environment has numerous design determinants in the form of existing structures, city patterns, and microclimatic conditions.

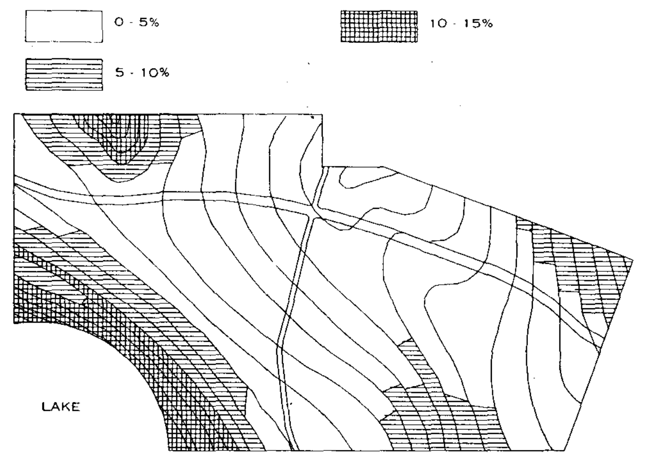
ENVIRONMENTAL CONSIDERATIONS

1. Air movement: Prevailing breezes characteristic of a region may be greatly modified by urban high-rise structures. Predominant air movement patterns in a city may be along roadways and between buildings. The placement, shape, and height of existing buildings can create air turbulence caused by micro air movement patterns. These patterns may influence the location of building elements such as outdoor areas and balconies. Also, a building's design and placement can mitigate or increase local wind turbulence.
2. Sun and shadow patterns: The sun and shadow patterns of existing structures should be studied to determine how they would affect the proposed building. This is particularly important for outdoor terraces and balconies where sunlight may be desirable. Sun and shadow patterns also should be considered as sources of internal heat gain or loss. Building orientation, window sizes, and shading devices can modify internal heat gain or loss. Studies should include daily and seasonal patterns and the shadows the proposed building would cast on existing buildings and open spaces.
3. Reflections: Reflections from adjacent structures such as glass-clad buildings may be a problem. The new building should be designed to compensate for such glare or, if possible, oriented away from it.

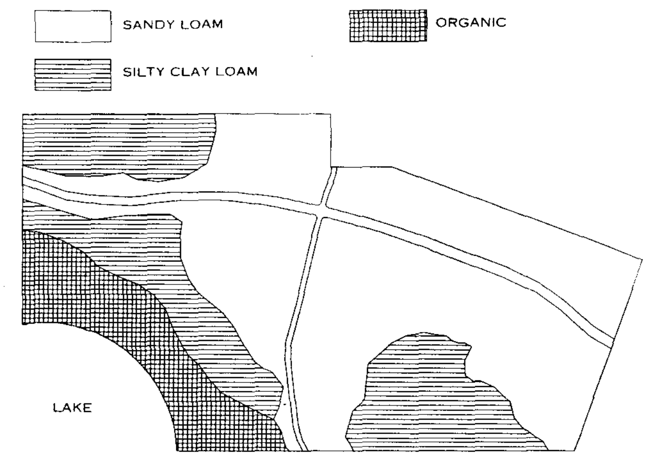
URBAN CONTEXTUAL ANALYSIS

1. Building typology and hierarchy: An analysis of the particular building type (residential, commercial, public) relative to the hierarchy of the various building types in the city is useful in deciding the general design approach of a new building. For example, public buildings may be dominant in placement and design, while residential buildings are subdominant. It is important to maintain any existing hierarchy that reinforces visual order in the city. Any predominant architectural solutions and details characteristic of a building type incorporated in the new building's design can help maintain a recognizable building type.
2. Regional character: An analysis of the city's regional architectural characteristics is appropriate in developing a design solution that responds to unique regional characteristics. Regional characteristics may be revealed through unique architectural types, through vernacular building resulting from local climatic and cultural characteristics, and from historically significant architecture. Historic structures should be saved by modifying them for the proposed new use or by incorporating parts of the existing structure(s) into the proposed design.
3. City form: The delineation of city form created by road layout, location of major open spaces, and architecture-created forms should be analyzed. Elements that delineate city form should be reinforced by architectural development solutions for a particular place within the city. For example, a building proposed for a corner site should be designed to reinforce the corner through building form, entrance, and design details. A building proposed for midblock may be a visually unifying element providing connection and continuity with adjacent buildings. Sites at the ends of important vistas or adjacent to major city squares probably should be reserved for important public buildings.
4. Building scale and fenestration: It is important to analyze building scale and fenestration of nearby structures. Reflecting, although not necessarily reproducing, such detailing in the proposed building can provide visual unity and continuity in the architectural character of the city. One example is the use and placement of cornice lines to define the building's lower floors in relation to adjacent buildings. Cornice lines also can define the building's relationship to pedestrians in terms of scale and use.
5. Building transition: Sometimes it may be appropriate to use arcades and porches to provide transition between the building's private interior and the public sidewalk. Including them may be especially worthy if adjacent buildings have these elements.
6. Views: Important city views of plazas, squares, monuments, and natural features such as waterfronts and parks should be considered. It is important to design the proposed structure to enhance and preserve such views for the public and for inhabitants of nearby buildings, as well as incorporating them as views from the proposed building.

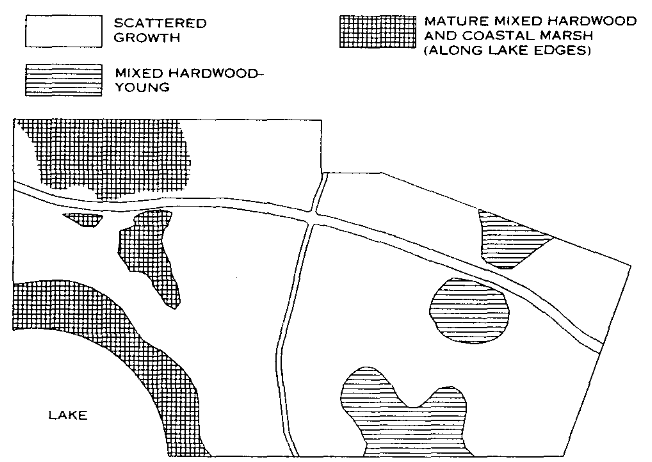
Gary Greenan, Andres Duany, Elizabeth Plater-Zyberk, Kamal Zaharin, Iskandar Shafie, Rafael Diaz; Miami, Florida



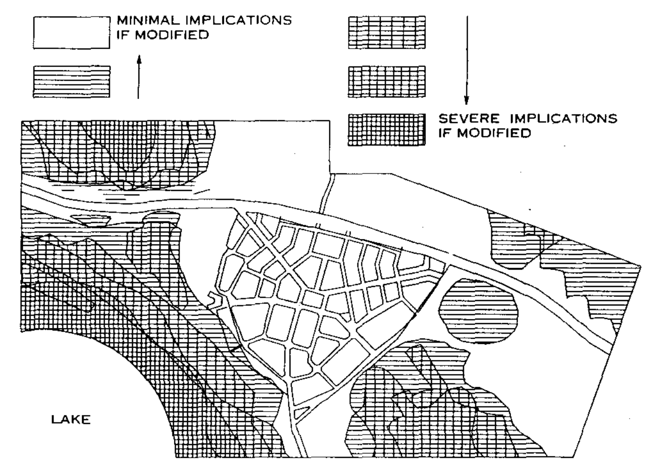
SLOPE



SOILS



VEGETATION



COMPOSITE

ENVIRONMENTAL SITE ANALYSIS PROCESS

If a site has numerous environmental design determinants, the site planner may analyze each environmental system individually in order to comprehend the environmental character of the site more clearly. This can be a complex process, and a site planner/landscape architect with expertise in environmental analysis should be retained to coordinate such an effort.

By preparing each analysis on transparencies, the site planner can use the overlay approach. Values are assigned to each sheet based on impact, ranging from areas of the site where change would have minimal effect to areas where change would result in severe disruption of the site. In essence, the separate sheets become abstractions with values assigned by the site planner and associated professionals. As each sheet is superimposed, a composite develops that, when completed, constitutes the synthesis of the environmental design determinants. Lighter tones indicate areas where modification would have minimal influence, darker tones indicate areas more sensitive to change. The sketches shown simulate the overlay process. The site planner may give greater or lesser weight to certain parameters depending on the particular situation. In assigning values that help determine the site design process, the site planner should consider such factors as the value of maintaining the functioning of the individual site systems, the uniqueness of the specific site features, and the cost of modifying the site plan.

Following is a list of the environmental design determinants that, depending on the particular site, may be considered and included in an overlay format:

1. SLOPE: The slope analysis is developed on the contour map; consideration should include the percentage of slope and orientation of slope relative to the infrastructure and land uses.
2. SOIL PATTERNS: Consideration may include the analysis of soils by erosion potential, compressibility and plasticity, capability of supporting plant growth, drainage capabilities, possible sources of pollution or toxic wastes, septic tank location (if relevant), and the pro- posed land uses and their infrastructure.
3. VEGETATION: Consideration of indigenous species (values of each in terms of the environmental system) includes size and condition, the succession of growth toward climax conditions, uniqueness, the ability of certain species to tolerate construction activities, aesthetic values, and density of undergrowth.
4. WILDLIFE: Consideration of indigenous species includes their movement patterns, the degree of change each species can tolerate, and feeding and breeding areas.
5. GEOLOGY: Consideration of underlying rock masses studies the depth of different rock layers and the suitability of different geological formations in terms of potential infrastructure and building.
6. SURFACE AND SUBSURFACE WATER: Consideration of natural drainage patterns covers aquifer recharge areas, erosion potential, and flood plains.
7. CLIMATE: Consideration of microclimatic conditions includes prevailing breezes (at different times of the year), wind shadows, frost pockets, and air drainage patterns.

COMPUTER APPLICATION

The above process is labor intensive when developed by hand on individual sheets of mylar; however, this particular method of environmental analysis is easily adaptable to the CAD (computer-aided drafting) system. Commercial drafting programs suitable for the overlay approach are readily available. Simplified, the method is as follows:

1. A map, such as a soil map, is positioned on the digitizer and the information is transferred to the processor through the use of the stylus. One major advantage to the use of a computer is that the scale of the map being recorded will be transferred to the selected scale by the processor. A hatched pattern is selected, with a less dense pattern for soil types that would have minimal influence and more dense patterns for soil types more sensitive to change. Once this information is programmed into the computer, it is stored.
2. The same process is repeated for development of the next overlay; for example, vegetation. Once again any scale map may be used. This process is repeated until all overlays have been stored. At any time one or all overlays can be produced on the screen.
3. The individual overlays or any combination of overlays can be drawn on mylar with a plotter. If appropriate for the particular analysis, the plotter will draw in color. The resulting overlay sheets take considerably less time than by hand and may be more accurate. Other benefits are that the site can be studied directly on the computer screen and any part of the overlay can be enlarged for greater detail.
4. The overlay process can be recorded by videotape or by slides from the screen for use in presentations.

Gary Greenan, Andres Duany, Elizabeth Plater-Zyberk, Kamal Zaharin, Iskandar Shafie, Rafael Diaz; Miami, Florida

SITE ANALYSIS MAP

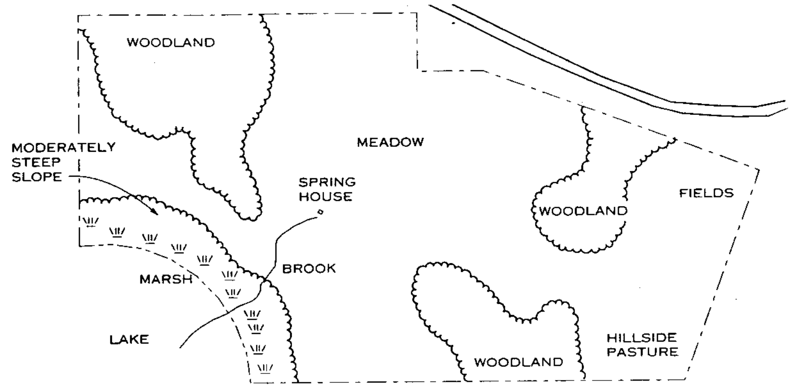
Locate natural, cultural, and scenic features first. These include many buildable areas, such as farm fields, pastures, meadows, and mature woodland; special features, such as stone walls, springhouses, cellar holes, and views into and out of the site; and unbuildable areas, such as steep slopes, wetlands, springs, streams, and ice ponds.

CONVENTIONAL LAYOUT OR "YIELD PLAN"

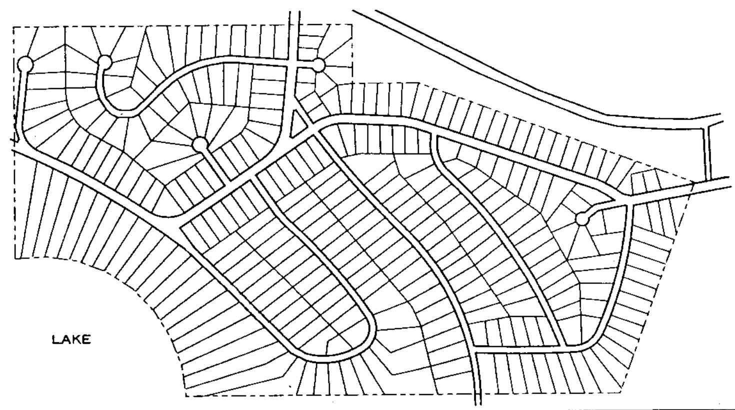
Sketch an unimaginative but legally correct conventional layout to demonstrate the density that could realistically be achieved on the site and, by comparison, to show local officials and abutters how different a rural village approach is. The sketch here shows how, under 1.5-acre zoning, a 520-acre site would ordinarily be checkerboarded into 300 lots, each with a required minimum area of 60,000 sq ft, leaving no open space whatsoever.

VILLAGE PLAN

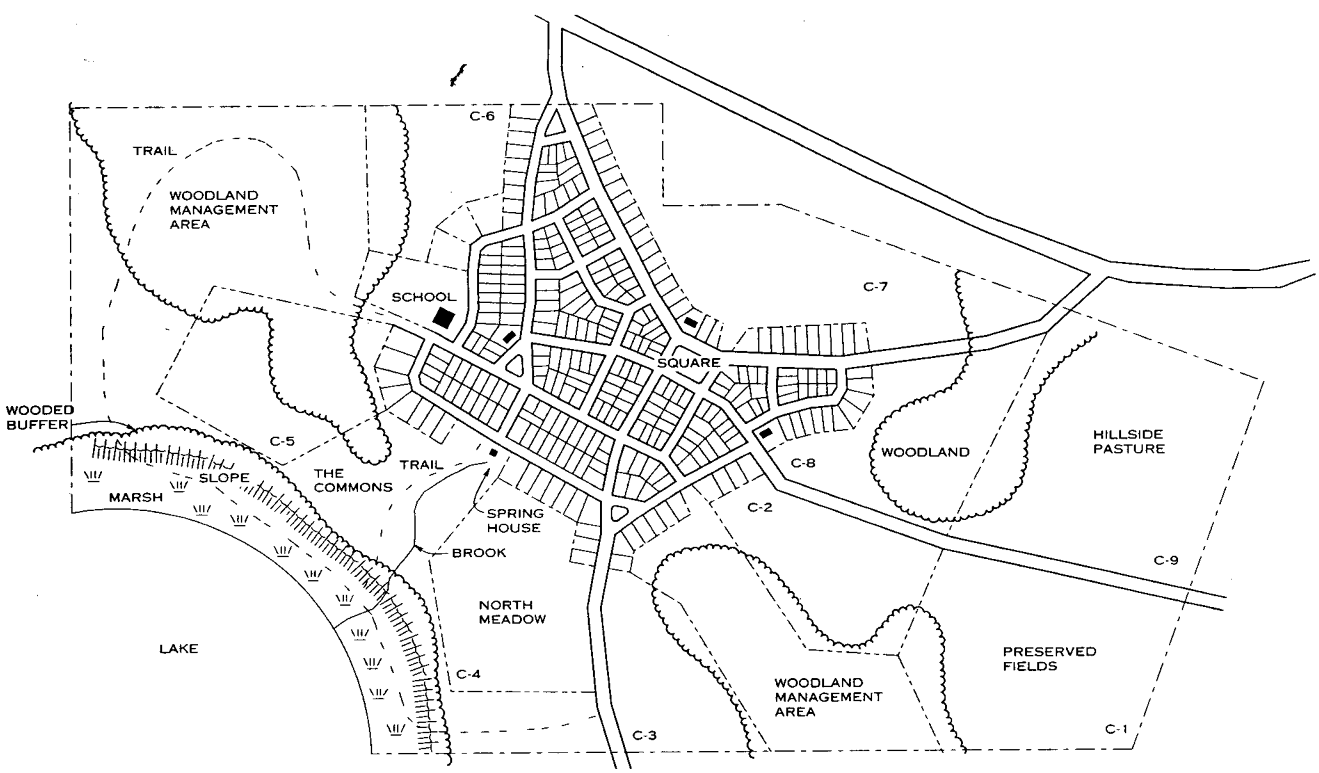
Designing the development as a traditional village, with lots ranging from 5000 sq ft to 1 acre, achieves slightly greater density on less than one-quarter of the land and preserves nearly 400 acres. This layout is based closely on the site analysis map, with the village located to avoid disturbing the woodlands that provide the only natural habitat in this largely agricultural community. The most special site features are protected by designing around them. Nine "conservancy lots," varying in area from 20 to 60 acres, are limited to one principal dwelling plus two accessory units. This assures significant open space around the perimeter of this 300-lot village. Permanent conservation easements protect these lands from further subdivision and preserve the 150 acres of undivided open space and its trail system, which connects the old springhouse to the lakeshore and leads back to the schoolyard. This open space could be owned by the village government, a local land trust, or a homeowners' association (with automatic membership and authority to place liens on properties of members who fail to pay their dues). Rural views outward from three village streets have also been preserved, with open countryside terminating their vistas. Terminated vistas are also provided by three large public or semipublic buildings (churches, libraries, etc.) positioned at the ends of several streets.



SITE ANALYSIS MAP



CONVENTIONAL LAYOUT



RURAL VILLAGE DESIGN

Randall Arendt, MRTPI; Natural Lands Trust; Media, Pennsylvania
Gary Greenan, Andres Duany, Elizabeth Plater-Zyberk, Kamal Zaharin, Iskandar Shafie; Miami, Florida

THE NEIGHBORHOOD, THE DISTRICT, AND THE CORRIDOR

The fundamental elements of urbanism are the neighborhood, the district, and the corridor. Neighborhoods are urbanized areas with a full and balanced range of human activity. Districts are urbanized areas organized around a predominant activity. Neighborhoods and districts are connected and isolated by corridors of transportation or open space.

Neighborhoods, districts, and corridors are complex urban elements. Suburbia, in contrast, is the result of simplistic zoning concepts that separate activities into residential subdivisions, shopping centers, office parks, and open space.

THE NEIGHBORHOOD

Cities and towns are made up of multiple neighborhoods. A neighborhood isolated in the landscape is a village.

The nomenclature may vary, but there is general agreement regarding the physical composition of a neighborhood. The neighborhood unit of the 1929 New York Regional Plan, the *quartier* identified by Leon Krier, traditional neighborhood design (TND), and transit-oriented development (TOD) share similar attributes. The population, configuration, and scale may vary, but all of these models propose the following:

1. The neighborhood has a center and an edge. This combination of a focus and a limit contributes to the social identity of the community. The center is a necessity, the edge less so. The center is always a public space–a square, a green, or an important street intersection–located near the center of the urbanized area, unless compelled by geography to be elsewhere. Eccentric locations are justified by a shoreline, a transportation corridor, or a promontory with a compelling view.

   The center is the locus of the neighborhood's public buildings. Shops and workplaces are usually here, especially in a village. In the aggregations of neighborhoods that create towns and cities, retail buildings and workplaces are often at the edge, where they can combine with others to draw customers.

   The edges of a neighborhood vary in character. In villages, the edge is usually defined by land designated for cultivation or conservation of its natural state. In urban areas, the edge is often defined by rail lines and boulevards, which best remain outside the neighborhood.

2. The neighborhood has a balanced mix of activities: shops, work, school, recreation, and dwellings of all types. This is particularly useful for young, old, and low-income populations who, in an automobile-based environment, depend on others for mobility.

   The neighborhood provides housing for residents with a variety of incomes. Affordable housing types include backyard apartments, apartments above shops, and apartment buildings adjacent to workplaces.

3. The optimal size of a neighborhood is $1/4$ mile from center to edge, a distance equal to a five-minute walk at an easy pace. Its limited area gathers the population within walking distance of many of its daily needs.

   The location of a transit stop within walking distance of most homes increases the likelihood of its use. Transit-oriented neighborhoods create a regional network of villages, towns, and cities accessible to a population unable to rely on cars. Such a system can provide the major cultural and social institutions, variety of shopping, and broad job base that can only be supported by the larger population of an aggregation of neighborhoods.

4. The neighborhood consists of blocks on a network of small thoroughfares. Streets are laid out to create blocks of appropriate building sites and to shorten pedestrian routes. An interconnecting street pattern provides multiple routes, diffusing traffic. This pattern keeps local traffic off regional roads and through traffic off local streets.

   Neighborhood streets of varying types are detailed to provide equitably for pedestrian comfort and automobile movement. Slowing the automobile and increasing pedestrian activity encourage the casual meetings that form the bonds of community.

5. The neighborhood gives priority to public space and to appropriate location of civic buildings. Public spaces and public buildings enhance community identity and foster civic pride. The neighborhood plan creates a hierarchy of useful public spaces: a formal square, an informal park, and many playgrounds.

THE DISTRICT

The district is an urbanized area that is functionally specialized. Although districts preclude the full range of activities of a neighborhood, they are not the single-activity zones of suburbia. Rather, multiple activities support its primary identity. Typically complex examples are theater districts, capital areas, and college campuses. Other districts accommodate large-scale transportation or manufacturing uses, such as airports, container terminals, and refineries.

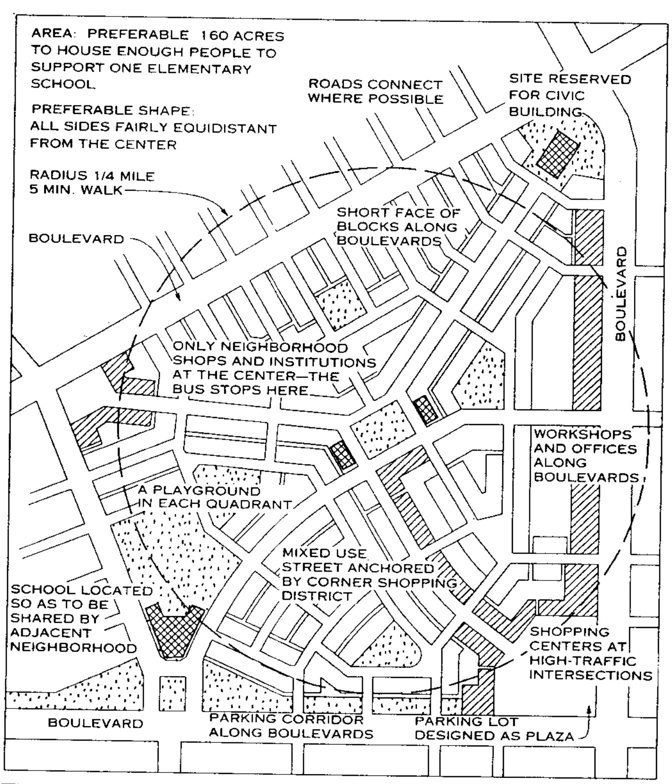
The structure of the district parallels that of the neighborhood. An identifiable focus encourages orientation and identity. Clear boundaries facilitate the formation of special taxing or management organizations. As in the neighborhood, the character of the public spaces creates a community of users, even if they reside elsewhere. Interconnected circulation encourages pedestrians, supports transit viability, and ensures security. Districts benefit from transit systems and should be located within the regional network.

THE CORRIDOR

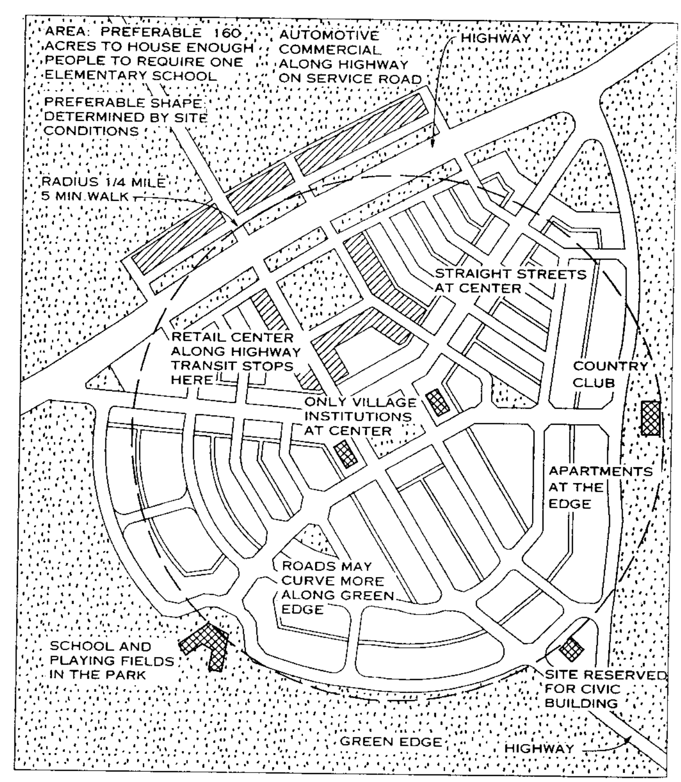
The corridor is the connector and the separator of neighborhoods and districts. Corridors include natural and technical components ranging from wildlife trails to rail lines. The between is not the haphazardly residual space remaining outside subdivisions and shopping centers in suburbia. It is a civic element characterized by its visible continuity and bounded by neighborhoods and districts, to which it provides entry.

The transportation corridor's trajectory is determined by its intensity. Heavy rail corridors should remain tangent to towns and enter only the industrial districts of cities. Light rail and trolley corridors may occur as boulevards at the edges of neighborhoods. As such, they are detailed for pedestrian use and to accommodate building sites. Bus corridors may pass into neighborhood centers on conventional streets.

The corridor may also be a continuous parkway, providing long-distance walking and bicycling trails and natural habitat. Parkway corridors can be formed by the systematic accretion of recreational open spaces, such as parks, schoolyards, and golf courses. These continuous spaces can be part of a larger network, connecting urban open space with rural surroundings.



AN URBAN NEIGHBORHOOD (PART OF A TOWN)



A RURAL NEIGHBORHOOD (A VILLAGE)

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The Cintas Foundation