Sustainable Urbanism: Urban Design with Nature

2008

Douglas Farr

Part One

The Case for Sustainable Urbanism

Part Two

Implementing Sustainable Urbanism

Part Three

Emerging Thresholds of Sustainable Urbanism

Part Four   Case Studies in Sustainable Urbanism

Neighborhood Diagrams

Illustrations by Regional Plan Association, Duany Plater-Zyberk & Company
and Farr Associates

Neighborhood Unit: Clarence Perry

Clarence Perry's diagram of the neighborhood unit, published as part of the 1929 Regional
Plan of New York and Environs, has influenced generations of plans. The enduring parts of the
diagram include its quarter-mile "pedestrian shed," its ideal size of 160 acres, a neighborhood
center surrounded by civic buildings, clearly delimited edges, commercial uses at the edge,
a network of narrow streets, small walk-to parks throughout, and the population needed to
support an elementary school. From the point of view of sustainable urbanism, the plan has a
number of shortcomings. For instance, it includes no reference to public transit or varied
housing types, neglects the river asset, misaligns streets with those in adjacent neighbor-
hoods, and is silent on buildings and infrastructure.

An Urban Neighborhood (Part of a Town): DPZ

The Duany Plater-Zyberk (DPZ) urban neighborhood diagram, based on Clarence Perry's
neighborhood unit, is an update that resolves most of the earlier plan's shortcomings.
The diagram sensibly substitutes boulevards for highways, aligns local streets, proposes
a bus stop in the neighborhood center, adds parking, and sites the school to allow it to
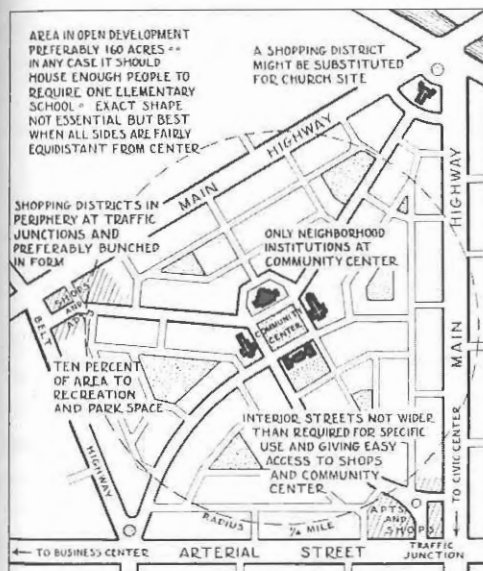
Neighborhood Unit
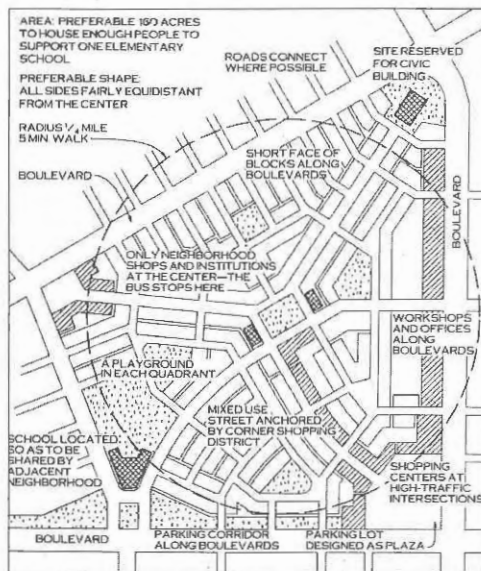
An Urban Neighborhood (Part of a Town)

Figure 7-1
Neighborhood unit for the Regional
Plan of New York by Clarence Perry,
1929. Image © Regional Plan
Association.

Figure 7-2
Updated neighborhood unit.
Image © Duany Plater-Zyberk
& Company.

serve multiple neighborhoods. The DPZ diagram also establishes a rule of thumb for establishing neighborhood parks—one per quadrant. From the point of view of sustainable urbanism, the DPZ diagram, like Perry's before it, remained silent on buildings and infrastructure and sees no role for nearby nonhuman habitat, going so far as to eliminate Perry's hypothetical river altogether.

Sustainable Urbanist Neighborhood

The sustainable neighborhood diagram below builds on the previous two, adapting them to meet current needs. Five distinctions result: (1) the neighborhood is a building block of a transit corridor; (2) the central DPZ bus stop is replaced with a higher intensity transit mode (BRT, trolley, light rail); (3) it is fitted out with high-performance infrastructure: district power, dimmable streetlights, and a share car per block; (4) the mix and density support car-free housing and a third place; and (5) habitat and infrastructure greenways give the neighborhood distinct edges.

AREA: PREFERABLY 160 ACRES, MIN. 40, MAX. 200
POPULATION: TO SUPPORT CRITICAL MASS OF WALK-TO DESTINATIONS.

NORTH
75% OF BLDGS.
ORIENTED E-W

ENERGY EFFICIENT ROUNDABOUT
DUAL-USE STORMWATER RETENTION & PLAY FIELDS
10 MIN. WALK
GRADE SCHOOL (MAY BE SHARED W/ ADJ. N'HOODS)
COMMUNITY GARDENS, GREENHOUSES, & MARKETS
CORRIDOR
INFRASTRUCTURE
ORCHARD UPTAKES WASTEWATER NUTRIENTS
RIVER
GREEN
1 & 2 FAMILY HOMES W/ COACH HOUSES
2-LANE STREETS CROSS MIN EVERY 1/8 MILE
CIVIC
STORMWATER BOULEVARDS
STREET LIGHTS DIM AT NIGHT
3 MINUTE MAX. WALK TO PARK
HABITAT
DIVERSE BLDGS. & DWELLINGS
ONE SHARE-CAR / BLOCK
CORRIDOR
DISTRICT ENERGY PLANT (CHP)
MIXED-USE MAIN ST. W/ 3RD PLACE
CAR-FREE MULTI-FAMILY
7-0" CLEAR CRITTER UNDERPASS
TRANSIT CORRIDOR
DOWNTOWN
TRANSIT STOP
STORMWATER & PARKING PLAZA
© FARR ASSOCIATES

Figure 7-3
Sustainable Neighborhood Diagram.
Doug Farr, Leslie Oberholtzer
and Christian Schaller.
Image © Farr Associates.

a Sustainable Neighborhood Unit (Building Blocks of a Sustainable Corridor)

Neighborhood Definition

Victor Dover and Jason King
Dover Kohl & Partners
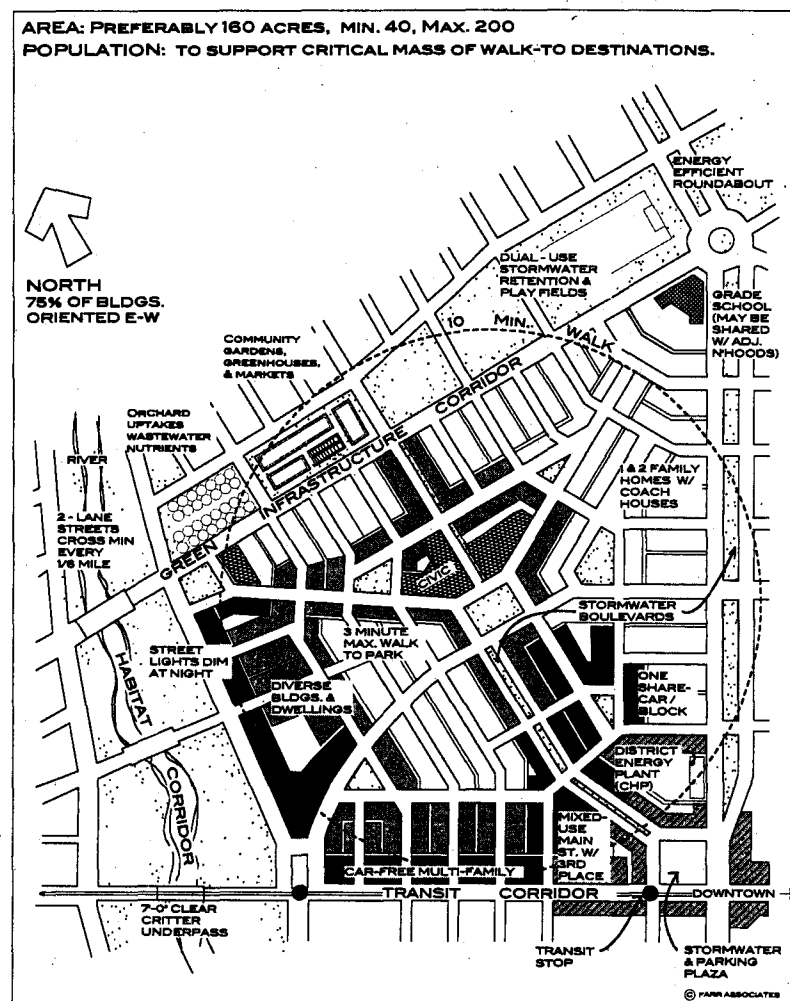
The traditional *neighborhood* is the basic increment of town planning. One neighborhood alone in the countryside is a *village*. Two or more neighborhoods grouped together sharing a specialized hub or main street is a town. The neighborhood concept remains in force even as the size increases to city scale; Paris, for example, is assembled from a series of many high-quality neighborhoods. Coupled with special districts and corridors, neighborhoods are the building blocks from which enduring settlements are formed. The dynamism and diversity that characterize attractive cities rely upon a solid foundation of vital and coherent neighborhoods.

In our time it's become necessary to reassert the definition of the term. We don't use the word *neighborhood* to refer to the disconnected, single-use developments that characterize sprawl, such as stand-alone apartment complexes, subdivision tracts, office parks, or shopping centers. Real traditional neighborhoods meet all those same needs— for housing, workplaces, shopping, civic functions, and more—but in formats that are compact, complete, and connected, and ultimately more sustainable and satisfying.

A genuine neighborhood is "compact, pedestrian-friendly, and mixed-use," according to the charter of the Congress for the New Urbanism. That said, we are often pressed to specify the exact parameters of the ideal neighborhood—minimum and maximum acreages, dimensions, densities, populations, commercial components, mix of dwelling types, and so on—but the metrics of neighborhoods should range widely to reflect regional customs, climates, and site conditions.

Although the numbers vary, there are five basic design conventions that provide a common thread linking great neighborhoods.

Identifiable Center and Edge to the Neighborhood

One should be able to tell when one has arrived in the neighborhood and when one has reached its heart.

There must be places where the public feels welcome and encouraged to congregate, recognizable as the heart of the community. A proper center has at least one outdoor public environment for this purpose, designed with pedestrians in mind; this is spatially the most well-defined "outdoor room" in the neighborhood. It is configured for gatherings both organized and spontaneous, for both ceremonies and day-to-day casual encounters. The size and formality of the central space vary from place to place, and while it most typically takes the form of a square or plaza, it is also possible to give shape to the neighborhood center with just a special "four corners" intersection of important streets. In most climates, shade or other protection from the elements is found at the center.

The best centers are within walking distance of the surrounding, primarily residential areas, and typically some gradient in density is discernable from center to edge. Centers possess a mix of uses and the potential for higher-density buildings at a pedestrian scale (four stories maximum for most circumstances, except at the metropolitan core).

Discernible centers are more important than discernible edges because of the center's usefulness in day-to-day life. Paul Murrain has observed that average urban dwellers probably care far less about a well-defined edge for their neighborhood than a well-defined center because the center affects the quality of life by being the place for meeting daily needs and connecting socially. The center is also the place for coalescing of community in response to adversity; we gather at the commons in times of emergency.

Delineating the neighborhood edge by design is more a source of psychosocial comfort than the meeting of a physical need, so the adjustments that are made to the urban fabric at the edge are often subtle.

Walkable Size

The overall size of the neighborhood should be suitable for walking. Neighborhoods range from 40 –200 acres.

Most people will walk a distance of approximately one-quarter mile (1,320 feet) before turning back or opting to drive or ride a bike rather than walk. This dimension is a constant in the way people have settled for centuries. Most neighborhoods built before World War II were one-quarter mile from center to edge.

Of course, neighborhoods are not circular in design, nor is that desirable. Neighborhoods tend to elongate along contours and ridges and compress at slopes because the walkability elongates across flat planes. The quarter-mile radius is a benchmark for creating a neighborhood unit that is manageable in size and feel and inherently walkable. We certainly should be willing to walk farther.

Neighborhoods of many sizes and shapes can satisfy the quarter-mile radius test. Large civic spaces such as modern schools with play fields require a great deal of acreage and can be situated where they are shared by more than one neighborhood. When the territory to be settled encompasses more acreage, larger planned communities can satisfy the quarter-mile radius by establishing several distinct neighborhoods or quarters within the community. Significant centers should be spaced about one-half mile apart or less.

Great neighborhoods have a fine-grained mix of land uses and housing types. Any mix of uses dramatically reduces the number of external automobile trips required by residents, and so there is no set minimum to the amount of commercial or office use that should be present. At least three dwelling types are necessary to create architectural diversity.

An assortment of uses gives residents the ability to dwell, work, entertain themselves, exercise, shop, and find daily needs and services within walking distance. An assortment of building types allows people with diverse lifestyles and incomes to live in the same neighborhood without a diminishing of the character or quality of that neighborhood. For instance, in a shopfront building, the business owner or employees could live in a second-floor apartment, or the upper floors could be rented as office space. Nearby row houses and cottages can be located very close to detached homes and even mansions. Naturally, this requires substantial design discipline; designers must work to make sure that compatible building types face one another across unified streets. Most transitions between substantially different building types should occur at the rear lot lines.

It is understood that the amount of nonresidential uses will vary from neighborhood to neighborhood. Some neighborhoods may only have a tiny commercial presence, but every live/work combination, also known as "zero-commute housing," eliminates at least one car from rush-hour traffic. The key is to provide great flexibility in land use even while tightening design controls to ensure compatibility. This shift—from focusing on land use to emphasizing design, from single-use, single-design "pods" to mixed-use, variety-rich neighborhoods—has benefits in three key areas.

First, in transportation, mixing uses is the most powerful way to reduce unnecessary traffic congestion because many auto trips are either shortened or eliminated. Second, the mixed housing scenario is far better socially, since it makes it feasible for householders to put down roots in a community and come to know their neighbors, and housing for families of modest means is included and therefore need not be segregated into concentrations (or pushed to the next county). Third, the occupation of the neighborhood by households with varied schedules and interests not only adds to the vibrancy of a place (as compared to suburbs that are deserted at certain times of the day or days of the week) but adds security as well.

Integrated Network of Walkable Streets

A network of streets allows pedestrians, cyclists, and motorists to move safely and comfortably through a neighborhood. The maximum average block perimeter to achieve an integrated network is 1,500 feet with a maximum uninterrupted block face of ideally 450 feet, with streets at intervals no greater than 600 feet apart along any one single stretch.

A "street network" is of course a connected web of streets, not necessarily a strict Cartesian grid. The street network forms blocks that set up logical sites for private develop-ment, and it provides multiple routes for walking, biking, or driving. The network of streets also provides nonmotorized alternatives to those under the driving age and senior citizens. Small block size and frequent intersections are necessary. When designing streets, we should strive to make them walkable first and then add provisions for cars, trucks, and emergency vehicles.

"Design speed" is the crucial number engineers officially use to configure streets for orderly traffic movement. The chosen design speed must be a low figure, usually less than 25 mph, for a highly walkable environment. The slow design speeds that characterize walkable streets result from the conscious choice of features such as narrow curb-to-curb cross sections, street trees, architecture close to the street edge, on-street parking, and relatively tight radii at the street corners.

The highest quotient of walkability will result when the buildings that shape the street space are set close enough to the front property line to spatially define the streets as public spaces, with a minimum degree of enclosure formed by a building-height-to-street-width proportion of 1:3 or closer.

Special Sites Are Reserved for Civic Purposes

In complete neighborhoods, it is always true that some of the best real estate is set aside for community purposes. These locations are made significant by the geometry of the town plan. Prominent locations, such as a terminated vista seen down a street or at the top of a hill, should be reserved for landmark buildings. These locations are deliberately selected for building sites that will conclude the long view down a street or for anchoring a prominent street corner or neighborhood square. These unique settings within the neighborhoods are the permanent anchors for community pride. Civic buildings, because they serve the entire community, should be accessible and located in areas with greater activity.

Similarly, special sites should be set aside for parks, greens, squares, plazas, and playgrounds. Each neighborhood should have one special gathering space at its center, such as a village green.

Parks are the largest of the open spaces, and contain natural preserves, paths, and trails. *Greens* are smaller but should ideally be large enough for a person to be away from the noise and movement of the street. *Squares* are often used for civic purposes. They are at least one acre in size, located at the intersection of major streets, and shaped by surrounding building frontages. Squares contain landscaping and trees that are deliberately arranged. *Plazas* are used for civic and commercial purposes (such as outdoor cafes) and are primarily hard-surfaced (stone, brick, pavement, etc.). They are smaller than a square and spatially defined by surrounding frontages. *Playgrounds* can be any size, are designed primarily for children, and may be part of larger parks or greens.[1]

Note

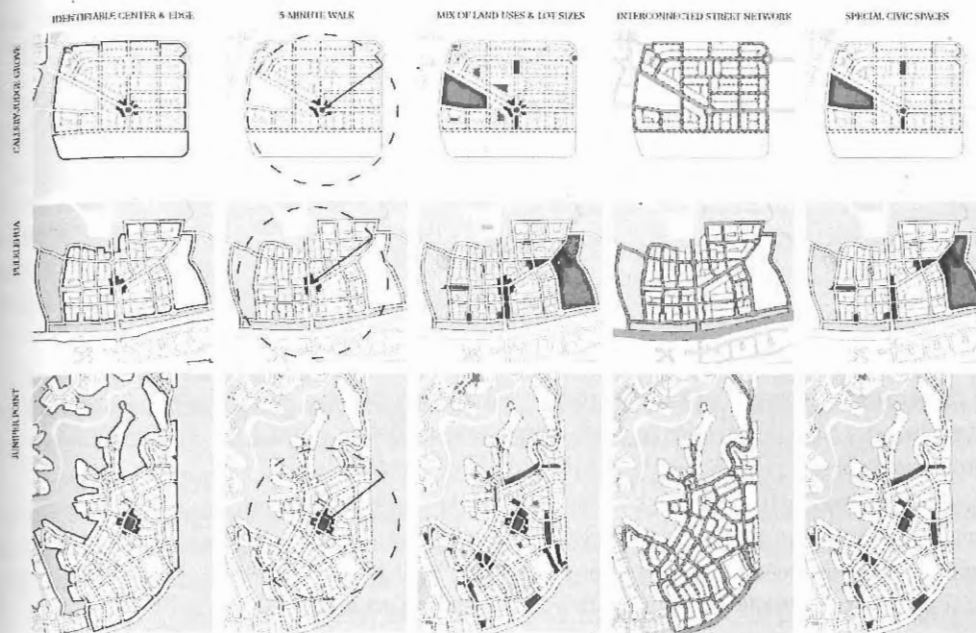1. Duany Plater-Zyberk & Company, SmartCode Annotated, Version 8.0, 2005.

Figure 7-4
Image © Victor Dover

Figure 7-4

	IDENTIFIABLE CENTER & EDGE	5 MINUTE WALK	MIX OF LAND USES & LOT SIZES	INTERCONNECTED STREET NETWORK	SPECIAL CIVIC SPACES
CALLERY JUDGE GROVE					
PULELEHUA					
JUNIPER POINT					

Table 7-1 Neighborhood Definition

Name	Location	Size (Acres)	% Area Devoted to Center (Acres)		Number of Primary Dwellings	Number of Accessory Dwellings	Net Residential Density (DU/Acre) [2]	S.F. of Commercial Space	Net Commercial Area (S.F./Acre)
Historic city of Charleston	Charleston, SC	1,015	9%	(88 acres)	5,428 [1]	Unknown [4]	7.6	Unknown [4]	Unknown [4]
Four wards in historic Savannah [5]	Savannah, GA	50	9%	(4.5 acres)	320 [1]	Unknown [4]	9.1	180,200 [3]	3,604
Seaside (original 80 acres)	Seaside, FL	80	5%	(4.1 acres)	330 [1]	Unknown [4]	8.2	153,034 [3]	1,912
The North End Neighborhood	Boston, MA	148	7%	(10.3 acres)	6,600 [1]	Unknown [4]	82.6	708,319 [6]	4,785
Forest Hills Gardens	Queens, NY	142	2.8%	(4.1 acres)	800 [1]	Unknown [4]	7.2	7,500 [3]	52
Callery Judge Grove	Palm Beach County, FL	89	3%	(2.7 acres)	460	350 [7]	9.96	18,000	390
Pulelehua	Maui, HI	108	6.4%	(6.9 acres)	438	101 [7]	11	62,768	1,586
Juniper Point	Flagstaff, AZ	151	9.5%	(14.4 acres)	1739	342 [7]	20	116,200	1,417
Optimum range		40-200	3-10%		400 min [8]				100-400

1. *Source:* US Census, 2000

2. Residential Density = Dwelling Units - Acres (which do not include roads, parks, and public areas); Source: ArcGIS 9 ESRI Data and Maps

3. *Source:* ArcGIS Business Analyst

4. Data unavailable

5. The four wards chosen are bounded to the north by Rt. 25, to the east by Lincoln Street, to the the west by Whitaker Street, and to the south by Oglethorpe Avenue.

6. *Source:* Boston Redevelopment Authority

7. Potential number of units once completely built

8. This minimum is based on 2007 assumptions about conventional retail channels of distribution and per-household purchasing.
   The number will change as sustainable urbanism advances.