

RECONSIDERING THE CUL-DE-SAC

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For many, the cul-de-sac street represents the ultimate building block of suburban development, yet the pattern “of loops and lollipops” has negative connotations in environmental design. It represents the essence of suburbia today: the isolated, insular, private enclave, set in a formless sprawl of similar enclaves, separated socially and physically from the larger world, and dependent upon the automobile for its survival.

Despite the criticisms of many leading architects and planners, particularly New Urbanists who advocate the interconnected gridiron, the cul-de-sac pattern continues to be highly valued by suburban residents and developers. In fact, much can be said in favor of the cul-de-sac itself as a pattern for neighborhood space, and the form has deep historical roots. What is a cul-de-sac? A French term, it means literally, “bottom of the sack.” Commonly, it refers to a dead-end street, row, lane, or a square, quad, quadrangle, place, or yard. The *Oxford English Dictionary* defines it as “a street, lane, or passage closed at one end, a blind alley; a place having no outlet except by the entrance.”¹ Thus, the term actually refers to a variety of physical configurations.

The cul-de-sac pattern has been strongly encouraged by traffic engineering and subdivision standards. In its typical manifestation, the suburban cul-de-sac is a relatively short street, usually less than 1,000 feet, serving up to 20 dwellings. It is terminated by a circular space large enough in diameter for service and emergency vehicles to turn around in, with a typical radius of 35 to 40 feet. Single-family houses, each with its own garage and driveway, usually line it on both sides and continue around the circle. Sidewalks and street trees may or may not line it. The only way into and out of this cozy enclave is via the single cul-de-sac entrance, which joins onto a collector street that services other similar cul-de-sacs. In its ideal form, all houses in a subdivision are situated on cul-de-sacs, and none are placed on the busier and noisier collector streets. A close cousin of the cul-de-sac is the loop street, which is similar in that it discourages through traffic, since it goes nowhere other than to the homes along it. However, it has two access points, and thus is usually longer than the cul-de-sac. Both loops and cul-de-sacs are often found in the same development.

This “loops and lollipops” pattern of residential land development has been criticized on several grounds. Obviously, it lacks the interconnectedness of earlier development patterns like the gridiron. One must always leave the cul-de-sac and get onto a collector street to go somewhere. Route choices are minimal, so one is stuck using the same paths day after day. Also, since so much of the street infrastructure is devoted to semiprivate dead-end roads, a heavy load of connecting and through traffic is forced onto a relatively small collector and arterial system, the cause of much suburban gridlock during peak periods of travel. For the pedestrian, walks can be long and boring, with inefficient connections to nearby destinations. One lacks the sense of being part of a whole, of being in a neighborhood or town that is truly one’s own, with a sense of civic identity. The main streets and treed corridors that connect places and that could communicate the personality and structure of a community are absent. What is left is a string of dead-ends on faceless connectors that seem to weave aimlessly. The pattern as it has evolved is usually difficult to conceptualize because there is so little apparent structure, no unifying element, or clear describable pattern. Moreover, it is usually boring in its repetitiveness. Of course, grid pattern developments can suffer from monotony, as well, despite the clarity and connectedness of the pattern.

Conceptually the cul-de-sac pattern, however, has several advantages that are worth considering. From the point of view of cul-de-sac and loop residents, the pattern offers quiet and safe streets, where children can play with minimal fears of the hazards of fast-moving traffic. A discontinuous short street system, unlike the grid, may promote neighboring, familiarity, and interaction.²⁻⁵ Analysis of automobile accident data over several years supports the cul-de-sac and loop patterns as being more safe. Furthermore, a hierarchical discontinuous street system has been found to deter burglary rates compared with easily traveled street layouts, since criminals avoid street patterns where they might get trapped.⁶ The troubled Five Oaks district of Dayton, Ohio was restructured to create several smaller neighborhoods by converting many local streets to cul-de-sacs. Within a short time traffic declined 67 percent and traffic accidents fell 40 percent. Overall crime declined 26 percent, and violent crime 50 percent. At the same time home sales and values increased.⁷

A comparative study of street patterns indicates significant user preference for the cul-de-sac and loop patterns for these reasons. Nine carefully selected California neighborhoods were examined in terms of safety performance and residents' perception of their street's livability.⁸ The study neighborhoods represented different street layouts—grid, loop, and cul-de-sac—but were matched demographically. The findings suggest that cul-de-sac streets, and especially the lots at the end, perform better than grid or loop patterns in terms of traffic safety, privacy, and safety for play. Residents also preferred the cul-de-sac as a place to live, even if they actually lived on a through or loop street. People said they felt cul-de-sac streets were safer and quieter because there was no through traffic and it moved more slowly. They also felt they were more likely to know who lived on the street. One resident's comment was typical: "Our pets and kids are safer when there is a no-outlet street; you feel kidnapping is less likely—there is more of a sense of neighborhood." Thus, the study generally corroborated earlier transportation research on the values of a hierarchical discontinuous street pattern to residential areas. It also supported claims that cul-de-sacs are more frequently and more safely used by children.^{9, 10} However, the cul-de-sac pattern was less preferred as an overall neighborhood pattern, and social interaction and neighborhood sense were not necessarily stronger on the cul-de-sacs. At the neighborhood scale, problems associated with cul-de-sac neighborhoods may stem more from land use issues than the street pattern itself. The single use zoning of most cul-de-sac neighborhoods results in poor access to schools, recreation, commercial centers, and jobs. Only rarely is there an interconnected pedestrian pathway system linking cul-de-sacs with adjacent streets, open spaces, and other neighborhoods.

The discontinuous street pattern is supported by market demand. Home buyers often pay premium prices for the most isolated cul-de-sac lots.^{11, 12} From the developer's perspective, the cul-de-sac pattern is popular, not only because it sells well, but also because the infrastructure costs are significantly lower than for the traditional interconnected grid pattern, which requires up to 50 percent more road construction.

This is a dilemma for the designer committed to a more structured design like the geometric grid. Might it be possible to satisfy both sets of needs: privacy, safety, and quiet, as well as connectedness, identity, and structure? The cul-de-sac certainly need not

be an amorphous blob. The same benefits could be achieved with more architecturally defined and ordered patterns such as the courts, closes, and quadrangles found in English, French, and German towns of the Middle Ages. The residential court is also found in many early American towns, from Philadelphia to Boston. Today such spaces are usually prized locations for their sense of privacy, their intimate scale and charm. [Figure 1]

A century ago, Raymond Unwin and Barry Parker consciously emulated such patterns, in their designs for Hampstead Garden Suburb in 1904. Unwin declared: “. . . for residential purposes, particularly since the development of the motor-car, the cul-de-sac roads, far from being undesirable, are especially to be desired for those who like quiet for their dwellings.”¹³ An act of Parliament was required to allow the use of cul-de-sacs in new development. For the first time a planned development systematically used the cul-de-sac and open court throughout. In the court and close arrangements, two- to three-story blocks of rowhouses or apartments define a central green space and are usually accessed by a narrow service road. This arrangement creates a relatively quiet, pedestrian-oriented environment that is removed from the public street, a semiprivate milieu of some architectural distinction. The cul-de-sacs achieve similar residential neighborhood values. Unlike the amorphous American postwar cul-de-sac, these are short and narrow, with no circular turn-around at the end. Typically, midblock pedestrian walks connect from the end of the cul-de-sac to another street or cul-de-sac beyond, making a well-connected and interesting path network for the pedestrian. Road types are hierarchical and are designed to discourage through traffic; they vary in both layout and cross-section according to function. Sidewalks are always present and are made interesting by the adjacent planting of trees and shrubs, as well as architectural details such as walls, fences, and gates that make each street a unique and interesting pedestrian path. Hampstead Garden Suburb thus became a major prototype for residential subdivision street design and road planning in Britain and North America. Sadly, the urban design qualities of the original have been lost in the offspring. [Figures 2, 3]

Imagine a suburban residential environment based on such courts and closes, each a defined space with its own special character, and with limited automobile access, yet situated within an overall structure of boulevards and public spaces that contribute to the sense of being part of a larger community. While automobile movement would be

controlled and limited to collector and arterial streets, pedestrian and bicycle circulation could have the kind of interconnectedness of the classic gridiron. The pedestrian network can parallel the vehicular ways, but can also connect cul-de-sacs and loops with each other, as well as with destinations such as parks, schools, and shops, creating a completely interconnected and efficient system. [Figure 4]

The scheme used in Radburn, New Jersey, designed by Clarence Stein and Henry Wright in 1928, is in fact a variant of this. Houses are clustered about automobile accessible cul-de-sacs. The pedestrian path system is expanded into greenways and parks, with paths connecting to each home, as well as the school. Pedestrian connectedness is offered with minimal interference from the automobile. Although the open spaces of Radburn are rather lavish, the idea could be achieved with much less open space focusing primarily on the pedestrian pathway system. [Figure 5]

Another example to consider is the retrofitting of traditional neighborhoods based on the interconnected grid found in most American small towns and streetcar suburbs built before the 1920s. These neighborhoods possess the connectedness, structure, walkability, and accessible land use patterns that many planners are seeking today in new residential developments. They are, however, subject to invasion by the automobile and often suffer from the noise and hazards that come with excessive traffic on local residential streets. Today there is a surge of interest in traffic calming measures across the country and many communities are taking steps to make streets more pedestrian and bicycle friendly. Berkeley, California is one community that has attempted to deal with the problem. In effect, the grid system has been converted into cul-de-sacs and loops as far as vehicular circulation is concerned by placing traffic barriers in the form of planted areas or large concrete planters across the street at selected points. Pedestrians and bicyclists, however, can continue to enjoy the interconnected grid. Originally an experiment, the scheme was strongly advocated by residents of participating neighborhoods, but was disliked by outsiders who lost their through vehicular access. Nevertheless, support was broad enough to make it a permanent program. [Figure 6]

Retrofitting an existing suburban cul-de-sac development to provide pedestrian connectedness would be more difficult. New pathways could be designed to interconnect

cul-de-sacs, but in most cases they would have to be built on private rights-of-way along lot lines. To acquire such easements would probably be difficult, since residents are unlikely to give up a portion of their land and privacy, even though the sacrifice would be small. Moreover, in most suburban developments of this type, the land use patterns do not support connectedness—typically there is very little to connect besides houses.

[Figure 7]

Are walkable suburbs possible today? New Urbanist advocates have kindled an important debate on the future of residential development patterns. By addressing and challenging established street design standards and regulations, their concepts provide a platform for discussion between designers, planners, engineers, and residents. Traffic engineers, in particular, need to review existing standards and to establish new frameworks that accommodate these trends. Perhaps the greatest need today is to develop patterns for new developments to support the pedestrian and bicyclist and to tame and confine the automobile.

FOOTNOTES

- 1 *Oxford English Dictionary* (New York: Oxford University Press, 1989).
- 2 H. Sanoff and J. Dickerson, "Mapping Children's Behavior in a Residential Setting," *Journal of Architectural Education*, 25:4 (1971).
- 3 Barry Smith, "Cul-de-Sac Means Safety, Privacy for Home Buyer," *The Atlanta Journal and Constitution* (January 14, 1973, Section H).
- 4 Donald Appleyard, *Livable Streets* (Berkeley, CA: University of California, 1981).
- 5 Hae-Seong Je, "Urban Residential Streets: A Study of Street Types and Their Territorial Performances," diss., University of Pennsylvania (1986).
- 6 J. Mayo, "Suburban Neighboring and the Cul-de-Sac Street," *Journal of Architectural Research*, 7:1 (1979).
- 7 Oscar Newman, "Defensible Space—A New Physical Planning Tool for Urban Revitalization," *Journal of the American Planning Association*, 61:2 (Spring 1995) 149–155.
- 8 Eran Ben-Joseph, *Livability and Safety of Suburban Street Patterns: A Comparative Study* (Berkeley, CA: Institute of Urban and Regional Development, University of California, Working Paper 641, 1995).
- 9 Sanoff and Dickerson.
- 10 Brenda Eubank, "A Closer Look at the Users of Woonerven," in *Public Streets for Public Use*, ed. Ann Vernez Moudon (New York: Van Nostrand, 1987) 63-93..
- 11 Smith.
- 12 Lloyd W. Bookout, "Neotraditional Town Planning: Bucking Conventional Codes and Standards," *Urban Land* (April 1992) 18–25; "Neotraditional Town Planning: The Test of the Marketplace," *Urban Land* (June 1992) 12–17.
- 13 Raymond Unwin, *Town Planning in Practice* (London: Fisher Unwin, 1909) 393.

ILLUSTRATIONS

1. Historic precedents: the court, the close, the lane.
2. Hampstead Garden Suburb closes and cul-de-sacs, plans.
3. Hampstead Garden Suburb closes and cul-de-sacs, views.
4. Designs for pedestrian connectivity with limited vehicular access.
5. Radburn cul-de-sacs.
6. Berkeley barriers.
7. Cul-de-sac vs. grid patterns.
8. Retrofitting suburban cul-de-sacs.