Rethinking Residential Streets

by Joseph R. Molinaro, AICP

In communities across the country, planners, engineers, developers, and local officials are trying to create more livable neighborhoods by taking a new look at design requirements for residential streets. Streets define the character of our communities and contribute to our sense of place — whether a quiet village, comfortable neighborhood, or bustling city street.

While interstate highways and arterial highways properly assign foremost priority to traffic needs, the residential environment must respond to many other concerns. Residential streets are more than just conduits for traffic; they form the setting for our homes and are where neighbors meet and talk and children play. In some ways, residential streets should be considered as extensions of our front yards, rather than as transportation facilities.

Unfortunately, outdated regulations in many communities require residential streets to be designed to standards that are suitable for major roadways. When the automobile began to dominate our landscape in the 1950s, transportation planners and engineers developed techniques for handling large volumes of traffic at higher speeds. This work, combined with substantial public funding, produced the modern, efficient highway network this nation enjoys today.

But many of the design standards developed for highways were incorporated into local subdivision regulations and inappropriately applied to residential streets. Too often, the result has been residential areas designed with streets that violate the sense of neighborhood and that encourage high-speed travel through our communities.

Inappropriate street standards also make our neighborhoods less attractive by requiring the paving of overly wide street surfaces. In addition to its unappealing aesthetic consequences, excessive pavement causes environmental problems — more stormwater runoff and heat buildup — and increases construction costs for the developer and maintenance costs for the community.

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STREET DESIGN PRINCIPLES

Street Hierarchy: Blanket standards for all streets ignore community needs and fail to recognize that different traffic characteristics demand different street design standards. For example, a cul-de-sac with 10 houses does not experience the volume and type of traffic carried by collector or arterial roads. Designing each street to match its function is at the heart of better street design standards.

While major roadways (arterials and collectors) are designed primarily for the smooth flow of traffic, local streets should be designed for much slower speeds. Traffic must be "kept in its place" if residential areas are to offer much-desired safety and low noise levels. The Boone County (Kentucky) Comprehensive Plan, for example, states that local streets should "[P]rovide the greatest degree of access to abutting property. Service of through traffic is clearly subordinate and even discouraged by low posted speeds and street design."

Street Width: Perhaps the most important design feature of any residential street is its width. Contrary to the common wisdom of earlier decades, engineers and planners now realize that in residential neighborhoods, wider streets are more dangerous than narrow streets because they encourage drivers to speed. Subcollector streets function well at 26-foot widths. Access streets, such as short lanes or cul-de-sacs, require widths of only 20 to 24 feet. The narrower widths assume that most resident parking is accommodated in garages or driveways.

Right-of-Way Width: The right of way need only be as wide as necessary to accommodate the street pavement, sidewalks, grass strip and street trees, and utilities. For a 26-foot wide subcollector street with sidewalks, a 42 to 46 foot right-of-way should be sufficient. A 22-foot wide cul-de-sac without sidewalks may need a right-of-way of only 24 feet.

Requiring excessive rights-of-way wastes land and places unnecessary restrictions on the layout of lots. Also, while rights-of-way for arterial roads may need to accommodate future widening, those for residential subdivision streets do not.

Street Geometry: Geometry is the

Streets serving only a few homes need only be twenty feet wide

term used by civil engineers to describe aspects of road design such as sharpness of curves and steepness of slopes. Obviously, the geometry required for a superhighway with a 65 m.p.h. speed limit is different than that needed for a residential street with a speed limit of 20 m.p.h. At high speeds, for example, safety requires more gradual curves; at low speeds, cars can easily negotiate the sharpest of curves.

Residential streets should be designed with tighter turns than major roads. These tighter turns force drivers to go slower, while also adding to the visual interest of the street. At intersections, the turn radius can be kept smaller, forcing cars to come to a full stop before turning rather than making a "rolling stop."

In determining geometry and street width, the need for providing emergency vehicle access must be addressed. But this does not mean that residential streets have to be oversized. Today's modern fire fighting vehicles are more maneuverable than earlier equipment, and oversized trucks such as hook and ladder typically do not respond to fire calls in single-family residential areas. If fire truck accessibility is a special concern in a community, it would be more economical to purchase trucks that fit local streets, rather than build all streets to meet the needs of the largest size fire trucks.

Working for Change

In Albuquerque, New Mexico, Larry Collins, the development director of Sivage Thomas Homes, suggested to the planning commission that the city amend its street standards in conjunction with its ongoing revision of Albuquerque's Development Process

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Defining Streets

Development codes or subdivision regulations can recognize variable street needs by specifying a hierarchy of streets. In *Residential Streets*, a joint publication of the American Society of Civil Engineers, the National Association of Home Builders, and the Urban Land Institute, the following four-tiered hierarchy is recommended:

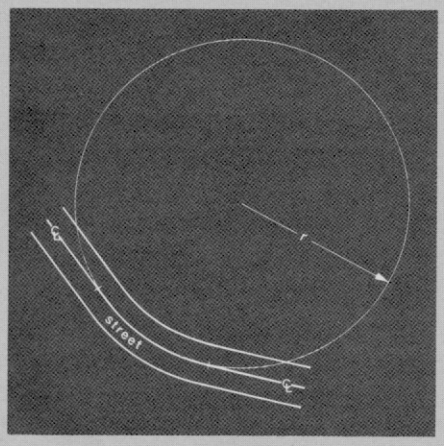
- *Arterial streets* are high-volume streets that conduct traffic between towns and activity centers and connect communities to major state and interstate highways. Typically, residences are not located on arterials.
- *Collector streets* are the principal traffic arteries within residential or commercial areas. They carry relatively high traffic volumes and should be designed to promote the free flow of traffic, including public transit buses and school buses. Some residences may front on these streets.
- *Subcollector streets* are relatively low-volume streets that provide access to residential lots and serve some through traffic to lower-order (access) streets.
- *Access streets* are the lowest-volume streets. Their purpose is to handle traffic between dwelling units and higher-order streets. They usually carry no through traffic and include short streets, cul-de-sacs, and courts. Access streets serve only a few dwelling units.

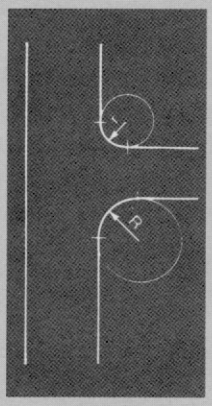
Resources

Residential Streets can be purchased from the National Association of Home Builders Bookstore, 1-800-223-2665.

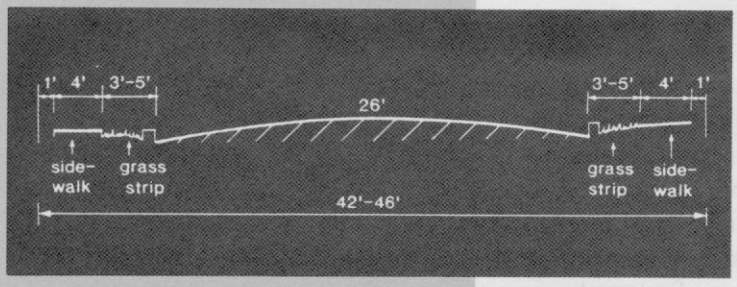
Street-Wise Glossary:

Horizontal curves are described by the radius of the circle formed by the centerline of that curve.





Intersection radius (or curb return) is the radius of the circle formed by the intersecting streets at the corner.



Right-of-way is the total width dedicated to public use, which may include, in addition to the street pavement, the areas for sidewalks, street trees, utilities, and maintenance.

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Manual (DPM). With the commission's encouragement, Collins convened a committee of private sector engineers and design professionals, which reviewed various published recommendations of national engineering and planning organizations.

The planning commission was impressed with the committee's effort and decided to establish a task force chaired by the former city traffic engineer. The task force included Collins, two planning commissioners, the city traffic engineer, and representatives of the fire chief and several other departments. It spent several months meeting with interested parties, discussing alternatives, and developing new standards.

While existing standards require all streets to be 32 feet wide, the task force recognized different types of streets. Its recommendations call for street widths ranging from 22 to 32 feet, with most falling between 24 to 28 feet. The recommendations would also reduce right-of way widths, and scale back on required horizontal curvatures. Further, they would reduce the intersection radius and the radius of cul-de-sac turnarounds.

In Livingston County, Michigan, a fast-growing county north of Ann Arbor, the county road commission's existing regulations do not differentiate subdivision streets from arterial roads. Rather, all streets must be designed to the county's standards for rural highways. This has resulted in excessive pavement and right-of-way widths for neighborhood streets. For example, all streets must have a right-of-way of 66 feet. Recently, however, many commissioners, planners, and builders have worked to evaluate these street standards and develop alternatives.

One alternative to meeting county road standards is for townships to adopt their own standards. But townships in Livingston County are not willing to accept dedication of streets. "Liability and maintenance are the two issues the townships are concerned about," says George Bacalis, president of Artisan Builders and chairperson of the County HomeBuilders' Public Policy Committee.

To develop more reasonable standards, the home builders are working with townships to develop mutually acceptable specifications for private streets, as well as legal language that will ensure that homeowners associations will assume responsibility for maintenance and liability. In addition, the county road commission has agreed to consider changes in its roadway specifications. An interdisciplinary committee formed by the county planning director will make recommendations to the road commission.

SUMMING UP:

Several decades of experience have demonstrated that residential street standards based on highway engineering concepts intended to move high-speed traffic do not produce the intimate scale, tranquility, and safety neighborhood residents want.

Planning for more livable streets has many constituencies: citizen groups, environmentalists, home builders, and planning and design professionals. As a result, an increasing number of communities have begun to rethink their street standards.

Joseph R. Molinaro, AICP, is Director of Land Development Services for the National Association of Home Builders in Washington, D.C., and is a coauthor of Residential Streets. *He holds a Masters of Urban and Regional Planning from Virginia Polytechnic Institute and State University.*