CHAPTER 16

RESIDENTIAL STREET DESIGN

TABLES

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A INTRODUCTION

The street is a public way designed for the purposes of serving motor vehicles, bicycles, pedestrians, and transit vehicles. The primary function of residential streets is to provide access to homes that front those streets. The primary consideration, therefore, of residential street design should be to foster a safe and pleasant environment for the residents that live along the ~~street,~~street and safe traveling conditions for motorists, bicyclists and pedestrians. The convenience of motorists is a secondary consideration.

The street design should create an environment that cautions drivers that they are in a residential area where they must safely share the traveling space with pedestrians and bicyclists, both child and adult. Visual cues such as meandering streets, sidewalks, landscaping, signage, narrowed streets, changes in pavement texture (such as brick~~,~~ stamped, or textured surfaces), and raised crosswalks all serve to heighten drivers' awareness for the need to maintain lower speeds. Incorporating such features into residential street design at inception will reduce or eliminate the need for traffic calming retrofits.

Section B of this chapter discusses the primary objectives of Residential Street Design in more detail, to aid the designer in the selection of proper criteria. ***Section C*** sets forth specific design criteria for residential streets.

B OBJECTIVES

The basic principles of residential street design are based on four factors:

1. SAFETY
2. EFFICIENCY OF SERVICE
3. LIVABILITY AND AMENITIES
4. ECONOMY OF LAND USE, CONSTRUCTION, AND MAINTENANCE

The following 17 principles incorporate these factors. These principles are not intended as absolute criteria, since instances may occur where certain principles conflict. The principles should therefore be used as concepts for layout of proper street systems.

1. Adequate vehicular and pedestrian access should be provided to all parcels.

2. Local street systems should be designed to minimize through traffic movements unless it is specifically desired by the County or municipality to connect residential developments.

3. Street patterns should minimize excessive vehicular travel through connectivity between adjacent residential developments, and to larger street networks.

4. Local street systems should be logical and comprehensible, and systems of street names and house numbers should be simple, consistent, and understandable.

5. Local circulation systems and land-development patterns should not detract from the efficiency of adjacent~~bordering~~ major streets due to lack of connectivity.

6. Elements in the local circulation system should not have to rely on extensive traffic regulations and enforcement in order to function efficiently and safety.

7. Traffic generators within residential areas should be considered in the local circulation pattern.

8. The planning and construction of residential streets should clearly indicate their local function. The street's residential nature should be obvious to those driving on them.

9. The street system should be designed for a relatively uniform low volume of traffic.

10. Local streets should be designed to discourage excessive speeds.

11. Pedestrian-vehicular conflict points should be minimized.

12. The amount of space in the land development devoted to motor vehicle uses should be minimized.

13. ~~There should be a limited number of intersections.~~Smaller block sizes may be used to encourage walking or bicycling. See ***Chapter 19 – Traditional Neighborhood Development*** for more information.

14. The arrangement of local streets should permit economical and practical patterns, shapes, and sizes of development parcels and provide interconnectivity without using arterials or collectors.

15. Local streets should consider and utilize topography from the standpoint of both economics and amenities.

16. Appropriate provisions for transit service within residential areas should be included.

17. Street design should consider horizontal and vertical compatibility and connectivity with sidewalks, bicycle lanes, and pedestrian walkways.

C DESIGN ELEMENTS

C.1 Design Speed

For local residential streets, design speeds of 15~~20~~ to 30 mph are appropriate, depending on the adjacent development, terrain, available right of way, and other area controls. Alleys and narrow roadways intended to function as shared spaces (that is, could be used to access driveways, for garbage pickup, and travel by walking or bicycling) may have design speeds as low as 10 mph. Design speeds greater than 30 mph in residential areas require increased sight distances and radii which are contrary to the function of a local residential street.

C.2 Sight Distance

C.2.a Stopping Sight Distance

The minimum stopping sight distance is shown in Table 16 - 1.

TABLE 16 - 1
MINIMUM STOPPING SIGHT DISTANCE FOR RESIDENTIAL STREETS

Design Speed (MPH)	Stopping Sight Distance (FEET)
10	45
15	75
20	125
25	150
30	200

C.2.b Passing Sight Distance

Passing should not be encouraged on local residential streets, and design for passing sight distance is seldom applicable on these streets. If longer straight sections and higher design and posted speeds support passing,

the street shall be designed under the design criteria established in ***ChapterHAPTER 3 – GeometricEOMETRIC DesignESIGN***.

C.2.c Intersection Sight Distance

Intersections shall be designed with adequate corner sight distance as set forth in Table 16 - 2. Intersection design should take into consideration growth of landscaping and other amenities. Where a local residential street intersects a higher-order street, the design criteria of the higher-order street shall control within the right of way of the higher-order street. Where the right of way of the higher-order street is indistinguishable from that of the lower street, the right of way for this purpose may be determined by connecting the points where the two rights of way intersect.

TABLE 16 - 2
MINIMUM CORNER INTERSECTION SIGHT DISTANCE
FOR RESIDENTIAL STREETS

Design Speed (MPH)	Corner Intersection Sight Distance * (FEET)
10	110
15	160
20	210
25	260
30	310

* Corner sight distance measured from a point on the minor road at least 14.5 feet from the edge of the major road pavement and measured from a height of eye at 3.50 feet on the minor road to a height of object at 3.5 feet on the major road.

Where stop or yield control is not used, the corner sight distance should be a minimum of 3200 feet. If restrictions are unavoidable, a minimum of , and desirably 2300 feet is allowed with proper warning signage found in the ***MUTCD***, such as an intersection warning sign (W2 series) or cross traffic does not stop here plaque (W4-4P)or more. To maintain the minimum sight distance, restrictions on height of embankments, locations of buildings, and screening fences may be necessary. Any landscaping in the sight distance triangle should be low growing, and should not be

higher than 3 feet above the level of the intersecting street pavements. Tree overhangs should be trimmed to at least 8 feet above the level of the intersections.

Intersecting streets should meet at approximately right angles. Angles of less than 60 degrees should be avoided.

C.3 Horizontal Alignment

C.3.a Minimum Centerline Radius

The minimum radii for horizontal curves are given in Table 16 - 3. Typically, superelevation should not be utilized on local residential streets. Where superelevation is appropriate or required, the street shall be designed under the design criteria established in ***Chapter~~HAPTER 3~~ – Geometric~~EOMETRIC D~~Design~~ESIGN~~***.

TABLE 16 - 3
MINIMUM CENTERLINE RADII FOR RESIDENTIAL STREETS

Design Speed (MPH)	Min. Centerline Radius (FEET)
10	25
15	50
20	89
25	166
30	275

C.3.b Minimum Curb Return Radius

Where there are substantial pedestrian movements, the minimum radius of curb return where curbs are used, or the outside edge of pavement where curbs are not used shall be 15 feet. A minimum radius of 25 feet is desirable to accommodate turning movements of service vehicles.

C.4 Vertical Alignment

C.4.a Vertical Curves

Vertical curves shall be designed for a minimum stopping sight distance using the design criteria of 30 mph established in ***Chapter 3~~HAPTER 3~~ – Geometric~~EOMETRIC~~ Design~~ESIGN~~.***

C.5 Cross Section Elements

C.5.a Width of Roadway

The minimum width of a two-way residential roadway shall be 20~~18~~ feet from edge-of-pavement to edge-of-pavement (excluding curbs and gutters). Travel lanes should be a minimum of 10 feet wide, and wider where practicable. Under constrained conditions or in some very rural areas, lanes 9 feet or narrower may be used. Refer to ***Chapter 4*** of the ***AASHTO Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT ≤ 400)***. Lanes narrower than 9 feet are prohibited in the absence of a Design Exception as provided for in ***Chapter~~HAPTER 14~~ – Design~~ESIGN~~ Exceptions~~XCEPTIONS~~***.

When parking lanes are provided on one or both sides of the roadway, they shall be at least 7 feet wide including the gutter section where applicable.

Where curb and gutter sections are used, the roadway may be narrowed to the travel lane width (plus bike lane if present) at intersections. This will prevent parking close to the intersection, reduce crossing distances for pedestrians, provide space for curb ramps, and reduce turning speeds. By providing ~~occasional midblock curb extensions, as well as~~ intersection curb extensions, the visual width of the roadway can be reduced.

C.5.b Medians

The minimum width for a median is 4 feet (6 feet if it is to serve as a pedestrian refuge). When median openings are provided to allow turns across the roadway, median opening length shall be adequate to accommodate the design vehicle's turning radius requirements.

C.6 Cul-de-sacs and Turnarounds

C.6.a Turning Area

~~A residential street open at one end only should have a special turning area at the closed end, and~~ A~~a~~ residential street more than 100 feet long and open at one end only shall have a special turning area at the closed end. This turning area should be circular and have a radius appropriate to the types of vehicle expected. The minimum outside radius of a cul-de-sac shall be 30 feet. In constrained circumstances, other turning configurations such as a "hammerhead" may be considered. Cul-de-sacs can detract from connectivity if used excessively or inappropriately.

C.7 Pedestrian Considerations

C.7.a Sidewalks

In residential areas, sidewalks should be provided on both sides of the street. The sidewalks should be located as far as practicable from the travel~~ffic~~ lanes and usually close to the right of way line. In certain circumstances, such as where ~~the adjacent~~ lots are very large or there are environmental limitations, sidewalk on only one side may be considered. Along collector roadways shared use paths may be provided in lieu of sidewalks. Connectivity to and between existing public sidewalk or shared use path facilities is desired.

Pedestrian access should be provided to schools, day care facilities, parks, churches, shopping areas, and transit stops within or adjacent to the residential development. Pedestrian access to these destinations and throughout the neighborhood shall be designed to for safe and convenient pedestrian circulation.~~from each house in the development should be as direct as practicable. With careful design, direct pedestrian access can be~~

~~provided to these destinations without requiring pedestrians to walk along high volume, high speed roadways. Mid-block crossings between houses, for~~ Ssidewalks or shared use paths between houses or to connect cul-de-sacs~~,~~ may be used where necessary to provide direct access.

Sidewalks, crosswalks and mid-block crossings shall be constructed under the criteria set forth in ***Section C.7.d*** of ***Chapter ~~HAPTER~~ 3 – Geometric~~EOMETRIC~~ Design~~ESIGN~~***, and ***Chapter~~HAPTER~~ 8 – Pedestrian~~EDESTRIAN~~ Facilities~~ACILITIES~~***.

C.8 Bicyclist Considerations

C.8.a Bicycle Facilities

Residential roadways are generally sufficient to accommodate bicycle traffic. ~~; however,~~ W~~w~~hen specific~~cial~~ bicycle facilities are desired~~,~~ they should connect to existing facilities and be designed in accordance with ***Chapter~~HAPTER~~ 3 – Geometric~~EOMETRIC~~ Design~~ESIGN~~*** and ***Chapter~~HAPTER~~ 9 – Bicycle~~ICYCLE~~ Facilities~~ACILITIES~~***.

C.9~~8.b~~ Shared Use Paths

~~Connections to schools, parks, shopping areas, and transit stops within or adjacent to the residential development should be provided. Bike lanes along collector and arterial roadways may be used to provide these connections. However, when designated bike lanes are not available, shared use paths may be utilized to provide direct access. A shared use path is a hard-surfaced pathway physically separated from motorized vehicular traffic by an open space or barrier. Shared use paths may be used by bicyclists, pedestrians, skaters, wheelchair users, and joggers.~~

Shared use paths may be provided in lieu of sidewalks along collector roads in accordance with Section C.7.a. When shared use paths are desired, they should connect to other pedestrian and bicycle facilities within or adjacent to the residential area, and connect to schools, day care facilities, parks, churches, shopping areas, and transit stops. Shared use paths shall be designed in accordance with ***Section C*** of ***Chapter~~HAPTER~~ 9 – Bicycle~~ICYCLE~~ Facilities~~ACILITIES~~***. Shared use paths may be used by golf carts in certain areas, in accordance with

Sections 316.212, 316.2125 and 316.2126, F.S.

C.10~~9~~ Clear Zone

Clear zone requirements for residential streets shall be based on ***Chapter~~HAPTER~~ 3 - Geometric~~EOMETRIC~~ Design~~ESIGN~~***, Table 3 - 13~~2~~. Clear zones should be provided along sidewalks and shared use paths to assure users are visible to vehicular traffic.

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