

CHAPTER 8

STREET DESIGN

8.0 GENERAL

A. Purpose

The purpose of this chapter is to define geometric design criteria for roadways within proposed and existing easements.

B. References

1. Unless otherwise noted, design City code and criteria for all roadways will conform to the applicable provisions in the Public Facilities Manual (PFM), Volume II.
2. The VDOT minimum design standards reference AASHTO “Green Book” policies and guidelines.

C. Variances

1. Deviations to City Code and PFM will be considered for innovative transportation approaches associated with land development proposals that are consistent with the geometric requirements in the VDOT Road Design Manual.

D. Definitions:

1. Minor streets - Streets which are used primarily for access to abutting property and not intended to provide through traffic movements (generally ADT <1000). Minor streets in new development shall have a minimum 50' right-of-way. (70-1, 70-95)
2. Collector streets - Streets which carry traffic from minor streets to the system of major streets (generally ADT >1000 but <5000). Collector streets in new development shall have a minimum 60' right-of-way. (70-1, 70-95)
3. Major or 'higher type' streets - Streets and highways which are used primarily for traffic movement. These streets shall have a minimum 90' right-of-way in new development. Existing higher type streets are characterized by traffic volumes of greater than or equal to 5000 vpd and/or posted speeds of at least 45 mph.

See PFM Chapter 16 Access Management for crossover spacing and sight distance.

8.1 GEOMETRIC STANDARDS

- A. Minimum street grade 0.2% regardless of the use of curb and gutter. (City Code Sec.70-97)
- B. Centerlines of all intersecting streets meet at a common point and shall intersect as near to a right angle as practical. (70-97)
- C. A barricaded stub street may be no more than one lot deep. If more than one lot, a City standard cul-de-sac is required. Cul-de-sacs are required for a permanent terminus of a dead-end street. All streets with a temporary cul-de-sac shall have a sign at the street's terminus stating the temporary nature of the cul-de-sac. (70-94c) (07/01)
- D. Improvements will be required along existing City streets in accordance with Section (70-167a) of the Chesapeake City Code.
- E. Street Width and Minimum Centerline Radius Requirements

RIGHT-OF-WAY	MAXIMUM ADT	MINIMUM CENTERLINE RADIUS
50'	ADT < 1000	125'
50' AND 60' CUL-DE-SACS	N/A	75' FOR LAST 600'
60'	$1000 \leq \text{ADT} < 5000$	650'
70' & 80'	ADT < 5000	650'
90' & GREATER	$\text{ADT} \geq 5000$	1,400'

*Minimum centerline for 70' and 80' right-of-way streets is 650' if the average daily traffic (ADT) is less than or equal to 5000 VPD. The minimum centerline radius for 90' right-of-way streets and higher is 1400'. Streets with rights- of-way 70' and greater and with ADT's higher than 5000 VPD shall design their centerline radii and provide super elevation in accordance with urban VDOT Road and Bridge Standards.

- F. In situations where roadside ditches are permitted along the frontage of a rural development; a shoulder shall be established in accordance with the table below.

Street Type Minimum Shoulder Width

Minor and Collector	10'
Higher Type Streets	12'

- G. Street and Roadside Ditch Requirements for Subdivisions with a Curb and Gutter Variance. (Granted by the Planning Commission or approved Rural Cluster Development).
1. Ditches shall have 0.5% minimum longitudinal slope.
 2. Ditches shall have a 2.5' maximum depth and a 0.5' minimum depth.
 3. 2:1 side slopes.
 4. Pavement width shall be no less than 26 feet.
 5. The shoulder shall be 6' or greater with geometry as specified by VDOT Standard Highway Geometry. (VDOT Road and Bridge Standards) (07/01)
 6. A minimum 50' right-of-way and drainage easements shall be dedicated to the outside top of the ditch banks are required.
 7. Deed restrictions in accordance with Appendix 7.
- H. In accordance with State Code 15.2-2021, curb ramps for use by persons with mobility impairments shall be constructed at intersections and crosswalks on all new curbed streets where there exists sufficient room for sidewalks. Ramps shall be constructed in accordance with Chesapeake City Standard found in PFM, Volume II.
1. Sidewalks are required on both sides of all new streets in accordance with Section 70-167b of the City Code. In new subdivisions sidewalks will be installed by the developer of the subdivision as part of the physical improvements required.
- I. Future road requirements and improvements to existing roads shall be considered in development plan design. Right-of-way dedication and reservation shall be made in accordance with City Code Sections 70-95 and 70-99. Future road requirements include but are not limited to the specifications made in the council adopted 2050 Master Transportation Plan. A grid of connecting streets at 1 mile intervals is necessary for proper local traffic circulation. The City shall be consulted to determine the exact location of future highways and connecting streets. Stub streets shall also be provided to serve as circulation points with the development of adjacent parcels.
- J. Vertical curves are required in accordance with Appendix 15 when the algebraic difference in the street grades is greater than or equal to 1% over a distance of 50'.

On proposed low speed local streets with less than 400 ADT and no future increase in traffic volume, minimum grade changes in vertical curves may be increased or eliminated when requested by the design engineer of record.

- K. Streets shall be located to align with existing or proposed streets in the adjacent subdivision. Stub streets shall be provided for connectivity to adjacent undeveloped or under developed property.
- L. Valley gutters - The use of valley gutters is permissible only when the cost of extending drainage to eliminate the valley gutter exceeds twice the cost of the valley gutter. Under no circumstances are valley gutters permissible on through streets. Cost calculations must be submitted substantiating the use of valley gutter at each intersection.
- M. Intersecting street crowns shall be designed to maintain the typical section of the most heavily traveled through street. A minimum 1% intersection cross-slope shall be maintained.
- N. Proposed street system or entrance shall tie into an existing paved, accepted street or one improved and bonded pending acceptance.
- O. Street improvements are required along all proposed streets adjacent to lots being recorded. Stub streets are to be constructed to limits of subdivision.
- P. No more than one alternate pavement section is to be shown. It shall be noted that only one section shall be used on that portion of the roadway to be constructed.
- Q. Subdivision access - Not less than two public street access points shall be provided when the number of lots in a subdivision exceed 30 lots. See Fire Department Access criteria PFM Chapter 13. Regardless of number of unites, development must address connectivity with adjacent property to create a more efficient transportation network.
- R. Minimum Curb Return Radii At Intersections

1. Intersection curb radius table:

	MINOR STREET	COLLECTOR STREET
Minor Street	25'	40'
Collector Street	40'	40'

2. Any intersection involving a street with greater than a 60' right-of-way shall be designed to accommodate an AASHTO type WB-50 semitrailer

combination without entering opposing lane.

- S. The maximum block length within a new subdivision is 1400 feet.
- T. At least a 100 foot tangent length, or as prescribed by The City, shall be provided between all reverse curves. Tangent lengths less than 100' on minor streets will be considered with proper supporting documentation on a case-by-case basis.
- U. Minimum transition lengths for traffic lanes shall be determined by the following formulas:

40 MPH and below

Above 40 MPH

$$L = \frac{WS^2}{60}$$

$$L = WS$$

Where: L is transition length (FT).

W is width of lateral shift for the centerline of the vehicle (FT)

S is the speed (MPH)

- V. Tidal flooding shall be considered in site/subdivision street design. The entire length of every new street shall have some portion (or point) of the pavement riding surface above the Flood Insurance Study for 100 year storm (1% percent see table below). The 10-year tidal elevation must be below the gutter flow line or manhole rim in public facilities. Tidal elevation frequencies are to be based on Flood Insurance Study for the City of Chesapeake by the Federal Emergency Management Agency.

STILLWATER ELEVATION TABLE NAVD-88

EASTERN BRANCH ELIZABETH RIVER All areas	8.0
INDIAN RIVER All areas	8.0
INTRACOASTAL WATERWAY/ALBEMARLE CANAL All areas	7.0
SOUTHERN BRANCH ELIZABETH RIVER All areas	8.0
WESTERN BRANCH ELIZABETH RIVER All areas	9.0
NORTHWEST RIVER All areas	7.0

Deviation from these elevations shall be based on current FIRM maps.

- W. The entire length of every new street (including private streets) shall have some portion or point of the pavement riding surface above the 100 year static elevation of the detention facility serving that roadway
- X. All private streets (excluding alleys) within a multifamily development shall have a minimum street width of 30 feet measured face of curb to face of curb, except in the following circumstances:
1. Where 40 or fewer attached multifamily dwelling units, or 24 or fewer detached condominium units, front or have direct access to a private street, the minimum pavement width (excluding curb and/or gutter) of such street shall be 24 feet of pavement. In calculating the number of units that front or have direct access to a private street, the term "street" shall be construed to include the full length of a continuous privately owned road, without regard to intersecting streets, alleys, drive aisles, lanes and other rights-of-way, whether public or privately owned.
 2. Where a private alley, lane or drive aisle is designed to provide access to the side or rear of a dwelling unit in a multifamily district for use by the residents of such unit, the minimum width of such alley, lane or drive aisle shall be 20 feet of pavement. Greater minimum widths may be required in accordance with the Public Facilities Manual as necessary to accommodate parking or other needs of the development.
 3. Notwithstanding the foregoing, any private street on which public school buses will travel shall have a minimum width of 30 feet, face of curb to face of curb.
- Y. Additional Private street criteria per Zoning Ordinance 6-1602.
1. All streets shall have a minimum centerline radius of 75 feet for streets 30 feet in width, and 50 feet for streets 24 feet in width, with no minimum tangent line. The director of development and permits, or designee, may adjust these standards were deemed necessary to accommodate unique design conditions.
 2. Minimum pavement design shall meet the specifications applied to public streets as set forth in the Public Facilities Manual.
 3. Minimum lighting standards shall meet the specifications applied to public streets as set forth in the Public Facilities Manual, provided that the director of development and permits, or designee, may approve alternate standards of lighting
 4. Curb and guttering shall be required on private streets in accordance with the specifications set out in the Public Facilities Manual, except that curb and guttering may be waived by the director of development and permits, or designee, for private alleys, lanes and drive aisles, not exceeding twenty-four (24) feet in width, where designed to provide access by residents to the side or rear of a dwelling unit in a multi-family zoning district. No rolled curbs shall be permitted on private streets, except as allowed by the director of development and permits, or designee, for such private alleys,

lanes, and drive aisles described above.

8.2 PAVEMENT CUTS & PAVEMENT WIDENING

- A. No pavement cuts will be permitted on streets with traffic counts greater than 7500 vpd, recently (within the last 24 months) overlaid streets or new streets without prior approval from the City. Lines must be jacked or bored under these streets. Plans must state "bore" or "jack" at each required pavement crossing. Pavement patches will be permitted on streets with traffic counts less than 7500 vpd. Plans must provide a detail in accordance with City Standard PC-1. Surface tolerance shall not exceed 1/4 inch. Valve boxes must be flush with the pavement. (Test per PFM, Vol. III) Traffic control plans must be submitted where open cuts have been permitted. No open cuts will be permitted for individual water laterals or franchise utility service lines unless the main line is located beneath the pavement and cutting is necessary to make the service connection.
1. Complete overlays are required under the following utility installations:
 - a. Projects which install utility lines down the centerline of the street.
 - b. Projects which have three or more utility cuts within a 500' interval.
 2. A complete overlay is not required with the addition of a complete new lane as long as the seam between the old and new pavement is not located in a travel lane and a consistent cross slope has been maintained from the centerline of the road to the new edge of pavement.
 3. Milling and overlays will be required to the centerline of the street under the following circumstances:
 - a. Projects where pavement cuts are limited to 1/2 of the street and there are more than 3 cuts in a 500' interval.
 - b. When necessary to ensure a consistent cross slope from the centerline of the street to the edge of pavement.
 - c. Pavement widening of existing streets requires mill & overlay to the adjacent lane line.
 - d. When eradication of lane lines would create unclear traffic canalization, pavement must be completely overlaid and re-stripped to the nearest lane line.
- B. Plans must indicate Pavement Cut standards PC 1 through PC-3 from PFM Vol. II.

8.3 STREET MAINTENANCE DEFINITIONS

- A. Public Street - A strip of land reserved as a right-of-way for public use and accepted into the City's street system for maintenance purposes and one which shall include those streets accepted by the Virginia Department of Highways for maintenance under the terms of the "Byrd Act" of 1932.
- B. Paper Street - A dedicated right-of-way, which has not been accepted for maintenance purposes by the City.
- C. Private Street - A right-of-way which has been recorded in the Clerk of the Circuit Court's office as being for ingress and egress to specific properties, or as an easement for ingress and egress to specific property.

8.4 PAPER STREETS

- A. No maintenance shall be provided for paper streets by the City. Before the City shall accept a paper street into the City's street system for maintenance purposes it shall be improved so as to be made eligible for state maintenance payments in accordance with the standards listed in Section 8.4.D.
- B. Proposed developments which include and/or are adjacent to substandard or unimproved right-of-way must make necessary improvements for acceptance into the public street system. The legal status of an apparently existing right-of-way must be determined first. Required road improvements can then be determined as a condition of development.
- C. Paper streets can be improved by a private homeowner, as a private access, to gain access to their parcel without bringing the street up to City standards for the following conditions:
 - 1. City will not provide maintenance of the private access within the paper street.
 - 2. Private access shall be limited to 500' and shall not be extended without improving the paper street to a public street standard acceptable for street maintenance.
 - 3. Private access can be used to serve up to a maximum of 5 properties.
 - 4. Wetlands investigation must be performed to determine the presence of wetlands. Any disturbance of wetlands shall be approved by the Army Corps of Engineers and DEQ, prior to disturbance.
 - 5. A construction plan is required for all proposed work within the right-of-way. No permits shall be issued prior to plan approval.

6. Drainage analysis shall be performed to determine the need for culvert crossings under the access to accommodate the upstream drainage area.
 7. Private accesses shall be for private use only. Mail delivery and garbage collection will be limited to the closest accepted and maintained public street.
 8. Right-of-Way Permit must be secured from the City prior to any construction in the right-of-way.
- D. Proposed improvements must comply with the minimum standards referenced in Section 8.0 B of this chapter.
1. Prior to acceptance for maintenance on a paved status by the City, paper streets shall be improved in accordance with the following standards as prescribed by the Virginia Department of Highways and the City of Chesapeake:
 - a. Paper streets recorded prior to July 1, 1950, shall have at least 40 feet of right-of-way and a pavement width of 20 feet. Pavement and base shall conform to current subdivision requirements. Proper drainage shall be provided for such streets.
 - b. Paper streets recorded after July 1, 1950, shall have at least 50 feet of dedicated right-of-way and a pavement width of 30 feet. Pavement and base shall conform to current subdivision requirements. Proper drainage shall be provided for such streets.
- E. Prior to approval of construction plans for improvements to paper streets, the responsible party shall enter into an agreement and post surety in accordance with subdivision ordinance.

8.5 RAILROAD CROSSINGS

- A. New streets that propose crossings of existing rail roads shall provide a rail crossing traffic control system. The minimum requirement is flashing lights and gates. In the case of existing public rail crossings, the City will accept responsibility for a reasonable annual maintenance and operations cost.
- B. The City of Chesapeake traffic control system requirements for rail crossings are as follows:
 1. Undivided Roadways - Flashing light signals and gates.
 2. Divided Roadways - Cantilever flashing lights and gates at all four quadrants.