Errata Sheet

For the document titled:
2008 Edition of SCDOT's *Access and Roadside Management Standards*

This errata sheet logs both content errors and minor implementation errors that have been identified since the release of the 2008 Edition of SCDOT's Access and Roadside Management Standards Manual. All page numbers refer to those indicated on the document pages and not the PDF formatted text. The corrected pages are included in this document.

If you downloaded or printed the document on or after the date of the latest erratum, the corrections have already been included in the main document.

Errata Posted: April 21, 2008

Subsection	Page	Description of Correction
4B	36	The title caption for Table 4-5 should read "Recommended On-Site Stacking Lengths"
7B-1.1	62	In the second paragraph, Equation 5.1 should be Equation 7.1
7B-1.1	62	Second bullet point under Medians, the font color for the beginning parenthesis for (Table 7-11 and Table 7-12) should be black.

Errata Posted: June 25, 2008

Subsection	Page	Description of Correction
Appendix A	A-6	Added *Algebraic Difference to the figure to define the maximum sag and crest break.
Appendix A	A-8	Corrected pavement markings for westbound approach.
Appendix B	B-1	The District 3 Office address should be 252 South Pleasantburg Drive, Greenville, SC 29607
Appendix F	F-1	The gross leasable area for the shopping center land use should be 3,000 sq. ft.
1A-3	6	Removed 57,500 Gallons fuel saved from Table 1-1
1B	7	Updated references to SC Code of Laws
3C-1	27	Figure 3-7 : Updated Middle Column title to read "Minimum Driveway Spacing (ft) on roadways with AADT $\geq$ 2000 or Driveways Generating more than 50 Peak Hour Trips"
5D-4	49	Added "Storage" to the title captions of Tables 5-8 and 5-9 and removed "deceleration length" from the 2nd sentence of the section
5D-5	51	First sentence – Changed "from 1 to 6 feet" to "to 1 to 6 feet" to match text found in the South Carolina Highway Design Manual
7B-1.1	64	Added "15 foot" to the title caption of Table 7-13
7C-5	69	The sight line (looking right) should be measured from the location of the driver's eye.
9E-3	80	Change barrier curb to "vertical face curb" in the first footnote to Table 9-18.

Errata Posted: July 28, 2008

Subsection	Page	Description of Correction
1D	8	Added definition for "Edge of Travel Way"
1D	11	Modified definition of design speed and posted speed limit
7B-1.1	62	Added table with AASHTO design vehicle lengths
7C-5	70	Added Intersection Sight Distance Quick Reference Table
9E-1	78	Section 3A-3 in the first sentence at the top of the page should read Figure 7-23
9E-1	79	First bullet point in Item "E" should read: Cabbage Plant – Tree is not suitable for planting throughout the state beyond the coast.
9E-3	79	First sentence of the section, edge of roadway should be changed to edge of travel way
9E-3	80	"Non-Interstate" should be removed from the title caption
9E-3	80	The title for the third column on the table should read "Offset from Edge of Travel way for Current Volume (ADT) of:
9E-3	80	End Parenthesis should be added to the offsets for "Without Guardrail" under "Interstate Routes"
9E-3	80	Removed "*** Measured from Edge of Travel way" and replaced **** with *** and modified table accordingly
10B	83, 84	Paragraph 2 in this section was modified to clarify when design for a 50-year storm is necessary

Errata Posted: August 18, 2008

Subsection	Page	Description of Correction
3C-2	28-29	Modified text and Figure 3-9 to clarify the spacing requirements for right-in, right-out access.

Errata Posted: November 16, 2009

Subsection	Page	Description of Correction
List of Tables	4	Modified typo in text in listing for Table 5-9.
2D-5	16	Revised first sentence to state "the owner shall be responsible for the maintenance of driveways and other access points…."
3B-2	22	Added third footnote to table to read "For one-way driveway use 14-24 feet depending on vehicle usage, widths should not encourage two-way movements
3B-2	23	Modified the last sentence in the next to last paragraph to state that "pavement markings may be required at the Department"s discretion."
3B-7	25	Added Section on Right-In, Right-Out Driveways
3B-7	26	Right-In, Right-Out Section carried over to this page.
4E	39	Modified sentence word order to read that "Turn lane lengths used should be in accordance with Figures A-9 and A-10 in Appendix A.
6B	56	In point #10, added "significant" between any and changes.
8B-1	72	Removed references to specific sections of the SCDOT Traffic Signal Design Guidelines and MUTCD.

12A	90	Modified the last sentence of the last paragraph to read "One copy shall be kept in the district and one copy forwarded to the as-built plans office in Preconstruction Support to be scanned and placed in the SCDOT Plan Library."
Page A-1		Added Figure A-11
Figure A-7.1		Added Right-In, Right-Out Figure
Figure A-11		Modified the distances for "B" in 30 and 45 degree parking to 11 feet and 14 feet, respectively. Added note to see SCHDM Figures 21.3A and 21.3C for parking lane widths.
Page B-4		Engineering District Map has changed.

Errata Posted: August 18, 2011

Subsection	Page	Description of Correction
2B	15	Added phrase "Plant Type Selection" to Table 2-2.
6A	54	Changed the word „pumps" to „positions" in Table 6-10.
9F	81	Added this sentence to first paragraph: Utility lines over bridge rights-of-way must be at a height sufficient to accommodate bridge maintenance, improvements and reconstruction.
9H	81	Added new section 9H "Historical Markers and Blue Star Memorial Highway Signs."
Page B-4		Engineering District Map has changed.
Page F-1		Changed the word „pumps" to „positions" in Table.

Errata Posted: Sept 26, 2012

Subsection	Page	Description of Correction
1E-2	12	Added paragraph on Access Waiver escalation.
2A-2	14	Added paragraph on Concurrence documentation.
2C	15	Added sentence on double bonding.

Errata Posted: April 27, 2015

Subsection	Page	Description of Correction
1E-2	12	Added sentence on Access Waiver Appeal Process Request.
1E-2	12	Deleted paragraph on Access Waiver escalation.
2E	19	Added section for Encroachment Permit Appeal Process Request.
9H	81-82	Modified entire section on Historical Markers.

Errata Posted: February 3, 2020

Subsection	Page	Description of Correction
9E	76-80	Deleted section on Landscaping Guidelines, see Chapter 14.
9E	76-79	Added section on Gateway Monuments for Interstate Highways.
Ch	81-82	Added Chapter 14 Landscaping Guidelines.

Subsection	Page	Description of Correction
1A-3	6	Updated Table 1-1.
1D	76-79	Updated definitions based on AASHTO and RDM.
1E-1	12	Revised Design Exceptions list.
1E-2	12	Added language to first paragraph of Access Waivers.
2A-1	13	Revised paragraph for encroachment permit applications.
2A-2	14	Removed “Traffic Study” from title and added to last sentence of first paragraph.
2B	14	Deleted Table 2-2.
2B	15	Added “letter of credit” to first sentence.
2D-2	16	Revised first sentence to add “redevelopment”.
2D-4	16	Added language to section.
2D-6	17	Included “restricted, relocated” to second sentence.
2D-9	17	Revised language in section.
2E	18	Deleted last paragraph.
3A	19	Changed AASHTO driveway definition to Green Book 2011.
3B-2	22	Changed one-way driveway width in footnote of Table 3-4.

Errata Posted: May 15, 2020

Subsection	Page	Description of Correction
3E-1	34	Revised Logging and Construction Driveways section.

Errata Posted: September 1, 2021

Subsection	Page	Description of Correction
2A	13	Referenced Appendix C “Directions for Completion of Permit Application”
2E	18	Added Flowchart outlining Permit Appeal Process found in Appendix C
Appendix	C	Changed title to Encroachment Permit Information
Appendix	C-7	Added Flowchart for Permit Appeal Process to Appendix C

Errata Posted: July 8, 2025

Subsection	Page	Description of Correction
4B	35-36	On-site stacking capacity revised; Table 4-5 removed

April 21, 2008

flow problems in loops intended for parents dropping-off and picking-up elementary students. Therefore, if a large kindergarten student population is anticipated, it is recommended that a separate loop be constructed for this operation. However, the loop's stacking capacity can be less than what is recommended for elementary students. Additionally, if a kindergarten loop cannot be constructed, then a separate parking area for these parents should be considered.

Table 4-5: Recommended On-Site Stacking Lengths

School Type	Student Population	Single Lane Loop Drive Stacking Length (Linear Ft.)
Elementary	Less than 600	1,200 – 1,500
	600 or more	1,500 – 2,000
Middle	Less than 600	1,200 – 1,500
	600 or more	1,500 – 2,000
High*	Less than 800	1,000 – 1,500
	800 – 2,500*	1,500 – 2,000

**For High school populations greater than 2,500 students, two separate student pick-up and drop-off loops should be considered.*

4C NUMBER OF SCHOOL DRIVEWAYS

The number of school driveways is important in assuring proper distribution of traffic along a site's frontage. Typically, elementary and middle schools function best when they are served by two separate access drives. One driveway is needed to serve the bus loop, while the other is necessary to serve the parent drop-off/pick-up loop (Note: If a school has an all-day kindergarten program, another access drive may be necessary). High schools should have at least three access drives. The first drive would serve the bus loop, parents would use the second drive for dropping-off and picking-up students, and the third drive would provide access to the student parking areas. For a high school with a large volume of student drivers, additional driveways may be needed for the student parking areas. The recommended number of drives is summarized in Table 4-6.

Consequently, there are circumstances when a new school has only one accessible driveway location. In these instances, it is essential that this access drive be designed to provide multiple lanes entering and exiting the site.

Table 4-6: Recommended Number of Drives

School Type	Number of Driveways
Elementary	2 – 3
Middle	2
High	3 – 4

7B-1 Case B – Intersections with Stop Control on the Minor Road

Where traffic on the minor road of an intersection is controlled by stop signs, the driver of the vehicle on the minor road should have sufficient sight distance for a safe departure from the stopped position assuming that the approaching vehicle comes into view as the stopped vehicle begins its departure. At a four-leg intersection, the designer should also check the sight distance across the intersection.

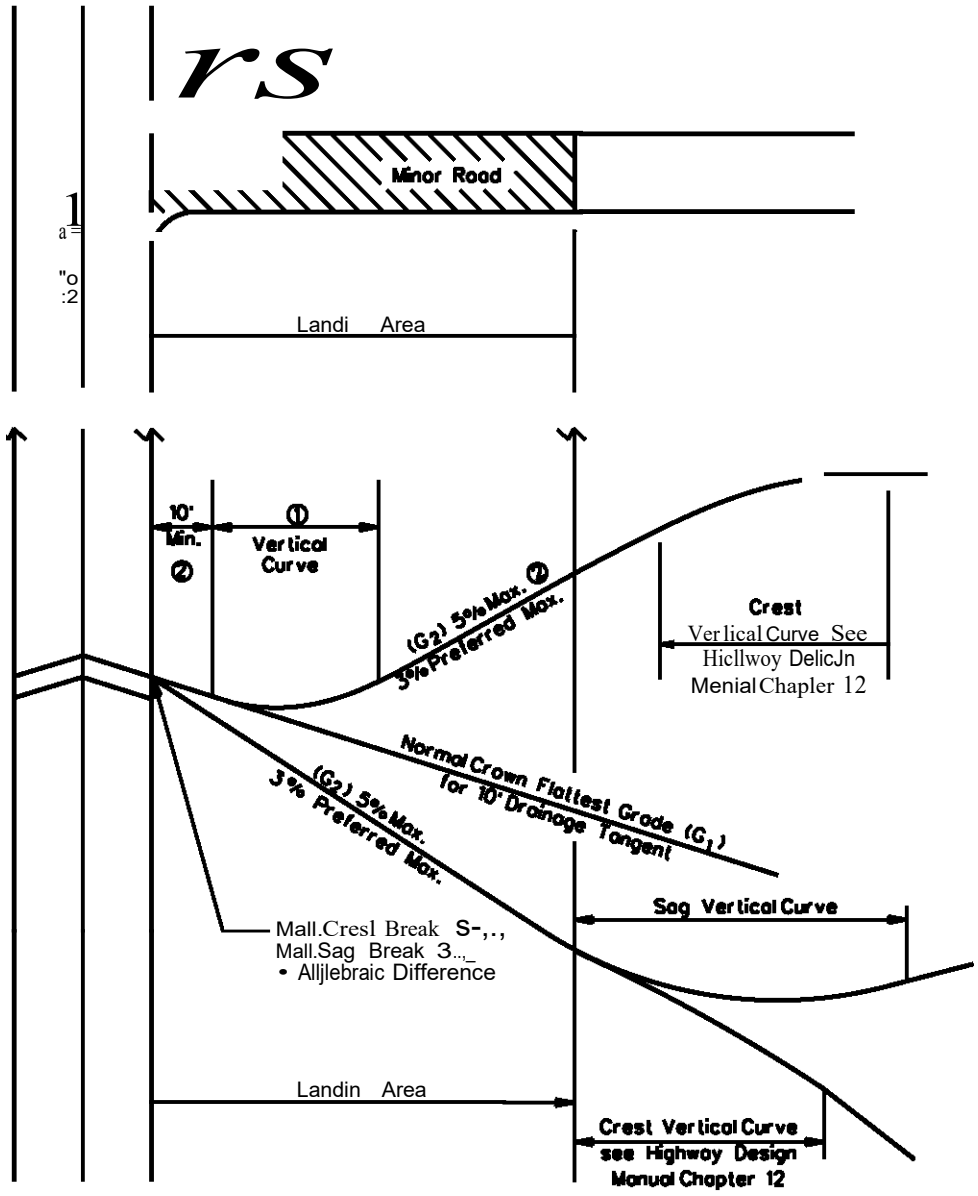
7B-1.1 Case B1– Left-Turn From the Minor Road

To determine the ISD for vehicles turning left onto the major road, the designer should use Equation 7.1 and the gap acceptance times (tg) presented in Table 7-11 for vehicles approaching from the left and right.

Table 7-12 and Table 7-13, which solve Equation 7.1, provide the ISD values for left-turning design vehicles onto a two-lane level facility and a four-lane with a two-way left-turn lane (TWLTL) level facility, respectively. The designer should also consider the following:

1) Multilane Facilities. For multilane facilities, the gap acceptance times presented in Table 7-11 should be adjusted (i.e., add 0.5 second for passenger cars or 0.7 second for trucks) to account for the additional distance required by the turning vehicle to cross the additional lanes or median.
2) Medians. The following will apply:
   - For a multilane facility which does not have a median wide enough to store a design vehicle, divide the median width by 12 feet to determine the lane value (e.g., for a 4-foot median use 0.33), and then use the criteria in Table 7-11 to determine the appropriate time factor.
   - On facilities with a median wide enough to store the design vehicle (e.g., 3 feet clearance at both ends of vehicle), the designer should evaluate the sight distance needed in two separate steps:
     - First, with the vehicle stopped on the side road (the bottom portion in Figure 7-24), use the gap acceptance times and distances for a vehicle turning right (Table 7-11 and Table 7-12) to determine the applicable ISD. Under some circumstances, it may be necessary to check the crossing maneuver to determine if it is the critical movement. Crossing criteria are discussed in 7C-1.3.
     - Second, with the vehicle stopped in the median (top portion in Figure 7-24), assume a two-lane roadway design and use the adjusted gap acceptance times and distances for vehicles turning left (Table 7-11 and Table 7-12) to determine the applicable ISD.
3) Approach Grades. If the approach grade on the minor road exceeds 3 percent, increase the level ISD value by 10 percent.
4) Design Vehicle. A passenger vehicle is used in most design ISD situations. However, at some intersections (e.g., near truck stops, interchange ramps, schools, grain elevators), the designer should use the design vehicle for determining the ISD. The gap acceptance times (tg) for passenger cars, single unit (SU) and tractor/semitrailer trucks are provided in Table 7-11. ISD values for level, two-lane roadways are presented in Table 7-12. The height of eye for these vehicles is discussed earlier in Section 7B.

June 25, 2008



1 See Chapter 15 of the Highway Design Manual for vertical curve options.

2 If practical. the gradient of the Iandino area where vehicles may be stored should not exceed 3 percent.

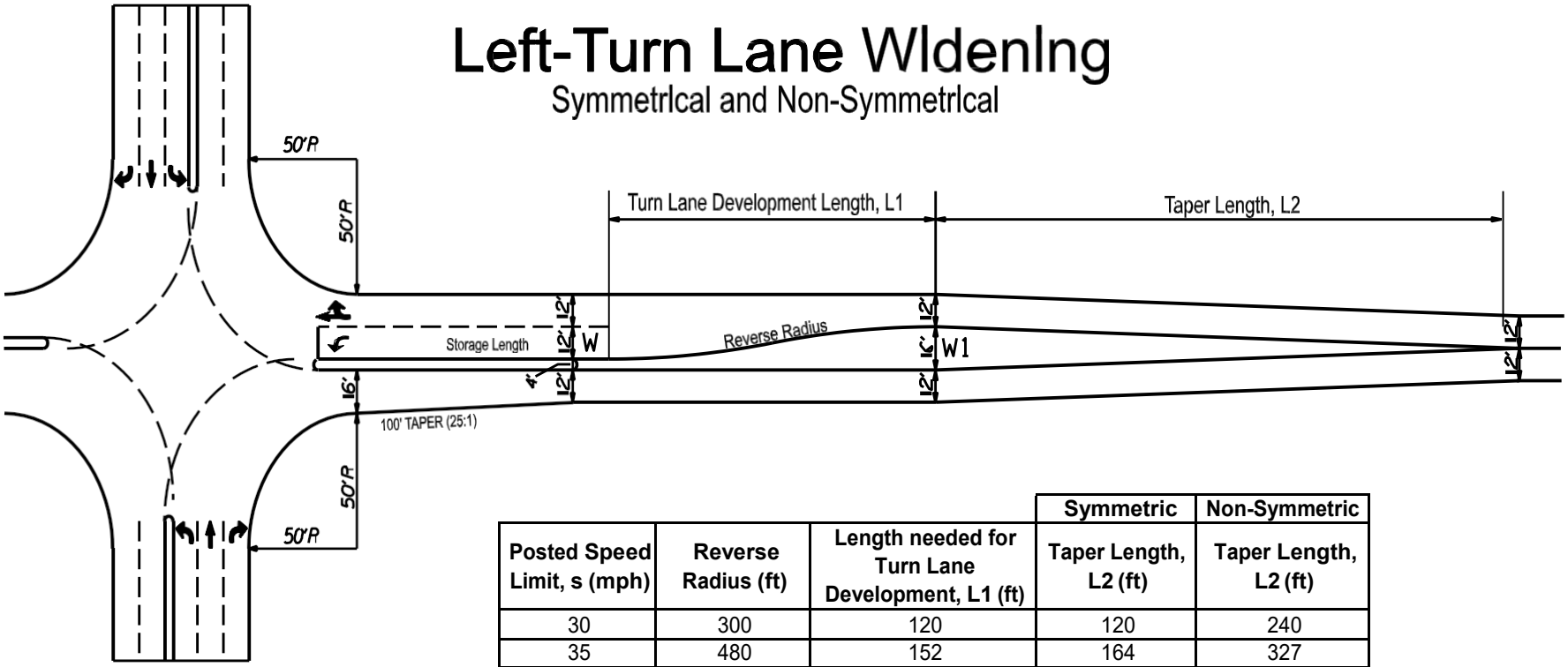
3 Actual field conditions wil l determine final desion •

VERTICAL PROFILE OF INTERSECTION OF STREET OR HIGH / MAJOR VOLUME DRIVEWAY

FIGUREA-6

Left-Turn Lane Wldenlng

Symmetrlcal and Non-Symmetrlcal



Posted Speed Limit, s (mph)	Reverse Radius (ft)	Length needed for Turn Lane Development, L1 (ft)	Symmetric Taper Length, L2 (ft)	Non-Symmetric Taper Length, L2 (ft)
30	300	120	120	240
35	480	152	164	327
40	480	152	213	427
45	670	179	360	720
50	670	179	400	800
55	840	201	440	880
60	840	201	480	960

Notes: Thls table provldes the deslgn values for the development of a 12 ft. left turn lane wlth 16 ft. of wldenlng. The formulas provlded can be used to determlne the deslgn values for other scenerlos.

Symmetrlcal Wldenlng

$$L1 = \sqrt{W(4R - W)}$$

$$L2 = \frac{W1 * s^2}{60} \quad S \leq 40 \text{ mph}$$

$$L2 = \frac{W1}{2} * s \quad S \geq 45 \text{ mph}$$

Non-symmetrlcal Wldenlng

$$L1 = \sqrt{W(4R - W)}$$

$$L2 = \frac{W1 * s^2}{60} \quad S \leq 40 \text{ mph}$$

$$L2 = W1 * s \quad S \geq 45 \text{ mph}$$

L1= Turn Lane Development Length
L2= Taper Length
W= Storage Lane Wldth
W1= Amount of Wldenlng
s= Speed Llmlt

SCDOT
South Carolina Department of Transportation
Access and Roadside Management Standards

FIGURE A-8

Appendix B

SCDOT Personnel Contact Information

HEADQUARTERS:

South Carolina Department of Transportation
955 Park Street
Post Office Box 191
Columbia, South Carolina 29202-0191

The following officials are located in the headquarters building:

Deputy Director for Construction, Engineering, and Planning.....(803) 737-7900
Director of Traffic Engineering .....(803) 737-1462
Director of Maintenance .....(803) 737-1290
Director of Construction .....(803) 737-1308
Director of Preconstruction.....(803) 737-1350
Utilities Engineer .....(803) 737-1293

DISTRICT ENGINEERING ADMINISTRATORS AND OTHER DISTRICT PERSONNEL:

District One	1400 Shop Road Columbia, SC 29201	(803) 737-6660
District Two	510 W. Alexander Avenue Greenwood, SC 29646	(864) 227-6971
District Three	252 South Pleasantburg Drive Greenville, SC 29607	(864) 241-1010
District Four	J. A. Cochran Bypass Post Office Box 130 Chester, SC 29706	(803) 377-4155
District Five	Post Office Box 1911 Florence, SC 29501	(843) 661-4710
District Six	6355 Fain Blvd. North Charleston, SC 29406-4989	(843) 740-1665
District Seven	US Route 178 East Bowman Road Drawer 1086 Orangeburg, SC 29116-1086	(803) 531-6850

2008 EDITION

Appendix F

Land Use	50 Peak Hour Directional Trips*
Single Family Home	45 units
Apartments	75 units
Condominiums/Townhouses	95 units
Mobile Home Park	85 units
Shopping Center – Gross Leasable Area (GLA)	3,000 sq. ft.
Fast Food Restaurant With drive-in – Gross Floor Area (GFA)	1,500 sq. ft.
Gas Station with Convenience Store	4 fueling pumps
Banks w/drive-in (GFA)	1,000 sq. ft.
General Office	33,500 sq. ft.
Medical/Dental Office	14,500 sq. ft.
Research & Development	35,500 sq. ft.
Light Industrial / Warehousing (GFA)	92,500 sq. ft.
Manufacturing Plant (GFA)	72,000 sq. ft.

*Rates/Equations used to calculate above thresholds are found in the 7th *Edition of the ITE Trip Generation Manual* for the P.M. Peak hour of the adjacent street.

increased pressure to allow a variety of additional activities to occupy the roadside. The Department's desire to satisfy the public's need for efficient and safe traffic movement has to be weighed against property owners' needs for adequate access while taking into consideration significant changes in traffic and roadside characteristics. Since the primary purpose of highways is to provide for the safe and efficient movement of traffic, control of access points on the roadside is paramount. Previous standards became inadequate for regulating the location, design, construction, operation, and maintenance of points of access to the State Highway System and other activities within highway rights-of-way. This necessitated the development of this revision to the ARMS Manual which contains more comprehensive standards in step with current highway and land development practices in the region and nation.

1A-3 Effects of Specific Access Management Techniques

Studies of the effects of access management on traffic operations have indicated that the techniques help increase safety, maintain desired speed, and reduce delays. Table 1-1 summarizes the general safety and operation effects of specific access management techniques based on research to date.

Table 1-1: Summary of Effects of Access Management

Treatment	Effects
Add continuous two-way left turn lane TWLTL	• 35% reduction in total crashes • 30% decrease in delay • 30% increase in capacity
Add nontraversable median	• 35% reduction in total crashes • 30% decrease in delay • 30% increase in capacity
Replace TWLTL with a nontraversable median	• 15%-57% reduction in crashes on 4-lane • 25%-50% reduction in crashes on 6-lane
Add a left-turn bay	• 25%-50% reduction in crashes on 4-lane • Up to 75% reduction in total crashes at unsignalized access • 25% increase in capacity
Painted left turn improvement	• 32% reduction in total crashes
Separator or raised divider for left turn	• 67% reduction in total crashes
Add right-turn bay	• 20% reduction in total crashes • Limit right-turn interference with platooned flow, increased capacity
Increased driveway speed from 5 to 10 mph	• 50% reduction in delay per maneuver; less exposure time to following vehicles
Visual cue at driveways, illumination	• 42% reduction in crashes
Prohibition of on-street parking	• 30% increase in traffic flow • 20%-40% reduction in crashes
Long signal spacing with limited access	• 42% reduction in total vehicle-hours of travel • 59% reduction in delay
Convert Stop controlled intersection to roundabout	• 47% reduction of all crashes • 72% reduction of injury crashes

1B AUTHORITY

These standards are enacted pursuant to Sections 57-3-110 and 57-5-1080 and 1090 of the *Code of Laws of South Carolina* (1976 as amended through the 2006 Session of the General Assembly) and with the approval of the South Carolina Department of Transportation Commission.

The SCDOT reserves the right to deny or revoke any encroachment that is deemed detrimental to the state highway system or public safety.

1C SEVERABILITY

If, for any reason, any phrase, clause, sentence, paragraph, section, subsection, figure, table, or other part of this manual of standards and guidelines should be decided by a court of competent jurisdiction to be invalid or unconstitutional, such judgment shall not affect the validity of these standards and guidelines as a whole, or any part thereof, other than the part so held to be invalid.

1D DEFINITIONS

Access – Entrance to and/or exit from land fronting on the public highway system.

Access Point – A location on a property frontage at which access is allowed by the Department.

Applicant – The owner of a property or his or her agent applying for an encroachment permit.

ADA or Americans with Disabilities Act of 1990 – Federal law prohibiting discrimination against people with disabilities. Requires public entities and public accommodations to provide accessible accommodations for people with disabilities.

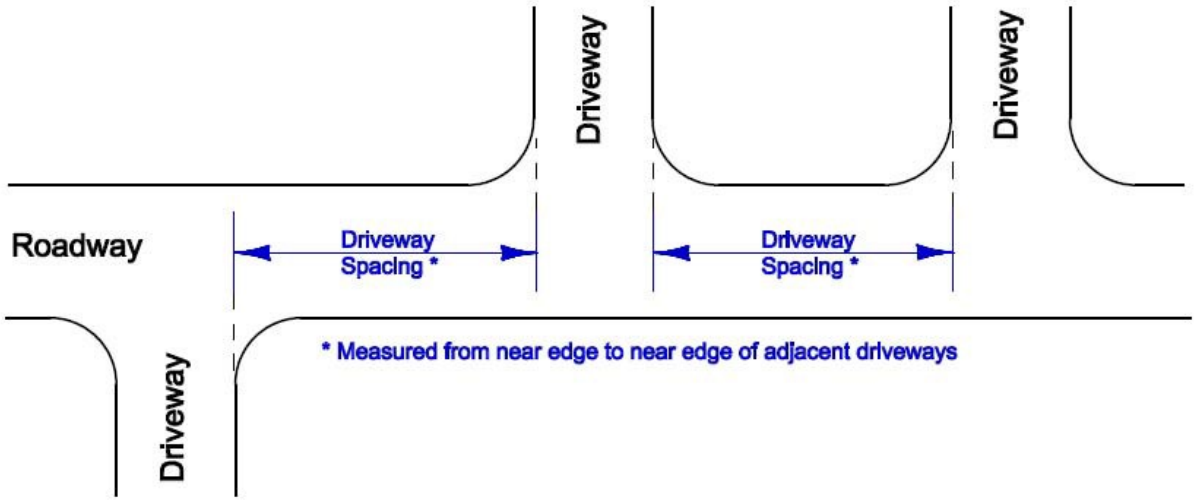
Americans with Disabilities Act Accessibility Guidelines (ADAAG) – Provides scoping and technical specifications for new construction and alterations undertaken by entities covered by the ADA.

Auxiliary Lane – The portion of the roadway adjoining the through traveled way for purposes supplementary to through traffic movement including parking, speed change, turning, storage for turning, weaving or truck climbing.

Average Annual Daily Traffic – The total volume of traffic passing a point or segment of a highway facility, in both directions, for one year, divided by the number of days in the year.

Average Daily Traffic – A general unit of measure for traffic expressed as the total volume during a given time period, greater than one day and less than one year, divided by the number of days in that time period.

Figure 3-7: Minimum Driveway Spacing



Posted Speed Limit (mph)	Minimum Driveway Spacing (ft) on roadways with AADT ≥ 2000 or Driveways Generating more than 50 Peak Hour Trips	Minimum Driveway Spacing (ft) on roadways with AADT < 2000
30	160	75
35	220	125
40	275	175
45	325	225
≥ 50	400	275

Exceptions to minimum driveway spacing include the following:

- The placement of residential (low volume) driveways. These drives should be placed in a reasonable location to avoid interference with adjacent drives as determined by the Resident Maintenance Engineer (RME).
- The replacement of a driveway to a property that may be lost or disrupted due to a SCDOT project.

In the case of large developments with outparcels, access for outparcels should be provided only internally; however, shared or individual driveways may be permitted provided that **twice the normal spacing** requirements are met. When direct access is approved, it may be limited to right-in, right out. Even when single or shared out-parcel driveways are allowed, additional access from the outparcels to the major development should be provided. Notation of access for outparcels shall be made on the plans for the development. Early coordination with the District Traffic Engineer is encouraged. For sample drawings of out-parcel access, see Figures A-2 and A-3 in Appendix A.

- Based on the capacity analysis, the necessary time for a protected left-turn phase becomes unattainable to meet the level-of-service criteria (average delay per vehicle); and/or
- There is insufficient space to provide the calculated length of a single-turn lane because of site restrictions (e.g., closely spaced intersections).

Dual right-turn lanes do not work as well as dual left-turn lanes because of the more restrictive space available for two-abreast right turns. If practical, the designer should find an alternative means to accommodate the high number of right-turning vehicles.

Triple left-turn lanes require more specific justification and detail in the design than dual left-turn lanes. Because triple left-turn lanes are not common in South Carolina, early coordination with the Traffic Engineering division is recommended.

5D-4 Auxiliary Lane Design

The length of a right-turn and left-turn lane at an intersection should allow for both safe vehicular deceleration and storage of turning vehicles outside of the through lanes. The length of auxiliary lanes will be determined by a combination of its taper length (Figure 5-21) and storage length (Table 5-8 and Table 5-9). When widening is necessary to accommodate a turn lane, the methods presented in Figure A-8 should be used.

Table 5-8: Right-Turn Lane Storage Lengths

Turning Volume (vph)	Percent of Trucks in Turning Volume				
	0% to 10%	20%	40%	60%	100%
50	Minimum length of 100 ft				
100					125 ft
150		125 ft	175 ft	175 ft	175 ft
200	150 ft	175 ft	225 ft	225 ft	250 ft
250	200 ft	225 ft	275 ft	275 ft	325 ft
300	250 ft	275 ft	325 ft	350 ft	400 ft
350	300 ft	325 ft	375 ft	425 ft	475 ft
400	350 ft	375 ft	425 ft	500 ft	550 ft

Table 5-9: Left-Turn Lane Storage Lengths

Turning Volume (vph)	Percent of Trucks in Turning Volume				
	0% to 10%	20%	40%	60%	100%
50	Minimum length of 150 ft. in Urban Areas Minimum length of 200 ft. in Rural Areas				
100					
150			175 ft	175 ft	175 ft
200		175 ft	225 ft	225 ft	250 ft
250	200 ft	225 ft	275 ft	275 ft	325 ft
300	250 ft	275 ft	325 ft	350 ft	400 ft
350	300 ft	325 ft	375 ft	425 ft	475 ft
400	350 ft	375 ft	425 ft	500 ft	550 ft

NOTES: 1) SCDOT Traffic Engineering should review the design to determine if longer turn lane lengths are required. 2) Consider providing dual turn lanes if volumes are greater than 300 vph.

5D-5 Offset Left-Turn Lanes

On medians wider than 17 feet, it is desirable to align the left-turn lane so that it will reduce the width of the median nose to 1 to 6 feet. This alignment will place the vehicle waiting to make the turn as far to the left as practical, maximize the offset between the opposing left-turn lanes, and provide improved visibility to the opposing through traffic. The advantages of offsetting the left-turn lanes are:

- better visibility of opposing through traffic and decreased probability of a conflict between opposing left-turn movements within the intersection; and
- more left-turn vehicles can be served in a given period of time, especially at signalized intersections.

Offset designs may be either the parallel or taper design; see Figure 5-22. The parallel design may be used at signalized and unsignalized intersections. However, the taper design is primarily only used at signalized intersections. Offset turn left-lanes should be separated from the adjacent through traveled way by painted or raised channelization.

Figure 5-22: Offset Left-turn Lanes

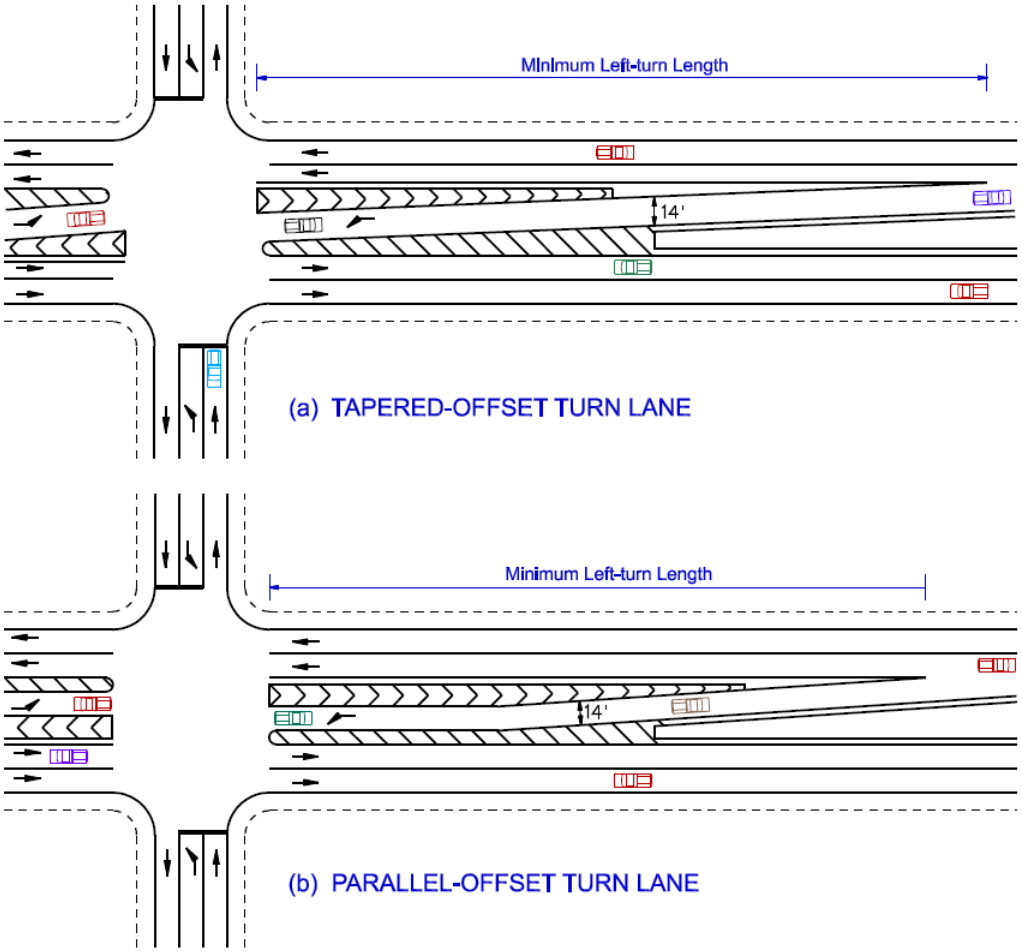


Table 7-13: Intersection Sight Distance For Vehicles Approaching from the Right on a Four-Lane Highway with a 15 Foot TWLTL Only

Design Speed (Vmajor) (mph)	Intersection Sight Distance (Feet)		
	Passenger Car	Single-Unit Truck	Tractor/Semitrailers
30	385	490	580
35	445	570	675
40	510	655	770
45	575	735	865
50	635	815	965
55	700	900	1060
60	765	980	1155

1. Calculated ISD is not shown. Values in the figure have been rounded up to the next highest 5-foot increment.

2. These ISD values assume a minor road approach grade less than or equal to 3 percent. For grades greater than 3 percent, increase the ISD value by 10 percent.

3. These ISD values assume the left-turning vehicle will enter the inside travel lane on the far side of the major road.

4. For a right turn from a minor road (i.e., ISD to the left), use the ISD values presented in Table 7-12.

5. Gap acceptance time (tg) adjustment factors have been used for each additional lane from the left, in excess of one, to be crossed by the turning vehicle (i.e., additional 0.5 second for passenger cars, additional 0.7 second for trucks).

Table 7-16: Gap Acceptance Times for Left Turns on a Major Road

Design Vehicle	Gap Acceptance Time (tg) (sec)
Passenger Car	5.5
Single Unit Truck (SU)	6.5
Tractor/Semitrailer	7.5

Adjustments: Where left-turning vehicles cross more than one opposing lane, add 0.5 second for passenger cars or 0.7 second for trucks for each additional lane in excess of one. See Section 10.4.5 of the SCDOT Highway Design Manual for additional guidance on median widths.

Table 7-17: Intersection Sight Distances, Left Turns from Major Road

Design Speed (Vmajor) (mph)	Intersection Sight Distance (Feet)					
	Passenger Car		Single-Unit Truck		Tractor/Semitrailers	
	Crossing 1 Lane	Crossing 2 Lanes	Crossing 1 Lane	Crossing 2 Lanes	Crossing 1 Lane	Crossing 2 Lanes
30	245	265	290	320	335	365
35	285	310	335	370	390	425
40	325	355	385	425	445	485
45	365	400	430	480	500	545
50	405	445	480	530	555	605
55	445	490	530	585	610	665
60	485	530	575	640	665	725

Figure 7-26: Sight Distance at Skewed Intersection

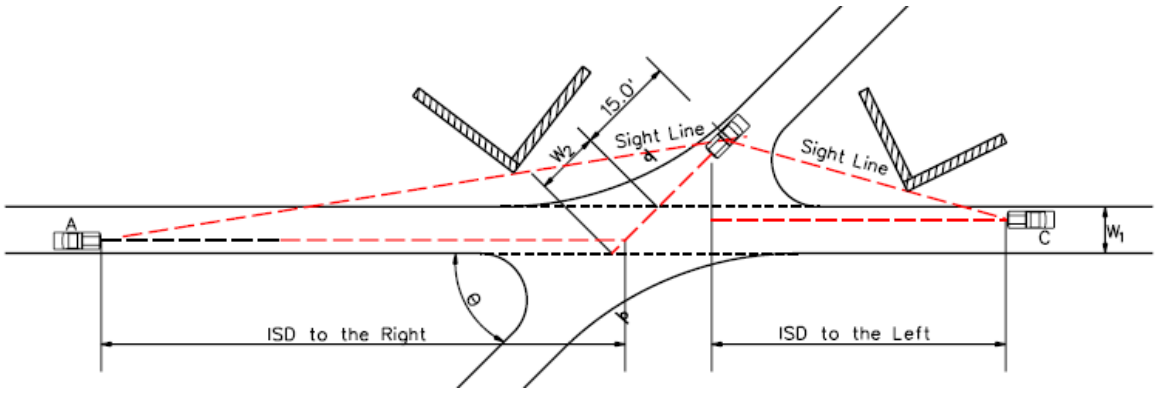


Table 9-18: Minimum Offset of Trees and Shrubs at Maturity (Non Interstate)

Roadside Feature	Roadway Design Speed	Offset from Roadway for Current Volume (ADT) of:	
		≤ 1,500	> 1,500
		ft.	ft.
Non-Interstate Routes			
Guardrail *	All speeds	4	4
Vertical face curb and gutter*	40 mph (60 km/hr) and less	1.5	1.5
	45 and 50 mph (70 and 80 km/h)	6	8
	55 mph (90 km/h)	10	12
6:1 or flatter cut slope ** (Metric 1:6)	40 mph (60 km/hr) and less	10	14
	45 and 50 mph (70 and 80 km/h)	14	18
	55 mph (90 km/h)	16	22
6:1 or flatter fill slope (Metric 1:6)	40 mph (60 km/hr) and less	10	14
	45 and 50 mph (70 and 80 km/h)	14	18
	55 mph (90 km/h)	16	22
4:1 to 5:1 cut slope (Metric 1:4 to 1:5)	40 mph (60 km/hr) and less	10	14
	45 and 50 mph (70 and 80 km/h)	12	18
	55 mph (90 km/h)	14	20
4:1 to 5:1 fill slope (Metric 1:4 to 1:5)	40 mph (60 km/hr) and less	12	16
	45 and 50 mph (70 and 80 km/h)	16	24
	55 mph (90 km/h)	20	26
3:1 cut slope (Metric 1:3)	40 mph (60 km/hr) and less	10	14
	45 and 50 mph (70 and 80 km/h)	10	14
	55 mph (90 km/h)	10	16
3:1 fill slope**** (Metric 1:3)	40 mph (60 km/hr) and less	12	16
	45 and 50 mph (70 and 80 km/h)	16	24
	55 mph (90 km/h)	20	26
Interstate Routes			
Without Guardrail***	All speeds	45 (for trees ≥ 4" caliper at maturity	
	All Speeds	30 (for trees ≤ 4" caliper at maturity	
With Guardrail***	All speeds	4	

* Where vertical face curb or guardrail exists, offset is measured from face of curb or guardrail. Please note that a vertical face curb and gutter in the median does not allow a 4" or greater diameter tree to be planted

**Use for all medians with curbing.

*** Measured from edge of travelway

**** The 3:1 fill slope is not to be used as part of the offset distance. Proper offset should be achieved by utilizing the distances specified as a total offset measured before and after the 3:1 fill slope. Fixed objects should not be present in the vicinity of the toe of these slopes.

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Bicycle lane or bike lane – A portion of a roadway which has been designated by striping, signing and pavement markings for the preferential or exclusive use of bicyclists. (AASHTO *Guide to the Development of Bicycle Facilities*, 1999)

Collector Road – Functionally classified highway that is characterized by a roughly even distribution of their access and mobility functions.

Controlled-Access Highway – A highway over, from, or to which owners or occupants of abutting properties or others have no legal right of access except at such points and in such manner as determined by the Department.

Corner Clearance – The minimum distance, measured parallel to a highway, between the nearest curb, pavement or shoulder line of an intersecting public way and the nearest edge of a driveway excluding its radii.

Crossover – A paved or graded area in the highway median designed specifically for vehicles to cross the median of a divided highway.

Cross Slope – The slope measured perpendicular to the direction of (pedestrian) travel.

Crosswalk – (a) That part of a roadway at an intersection included within the connections of the lateral lines of the sidewalks on opposite sides of the highway measured from the curbs or in the absence of curbs, from the edges of the traversable roadway, and in the absence of a sidewalk on one side of the roadway, the part of a roadway included within the extension of the lateral lines of the sidewalk at right angles to the centerline; (b) any portion of a roadway at an intersection or elsewhere distinctly indicated as a pedestrian crossing by lines on the surface, which may be supplemented by contrasting pavement texture, style, or color.

Directional Median Opening – An opening in a restrictive median which provides for U-turns and or left-turn ingress and egress movements.

Divided Highway – A roadway that has separate traveled ways, usually with a depressed or CMB median, for traffic in opposite directions.

Department (SCDOT) – The South Carolina Department of Transportation.

Driveway – An access point that is not a public street, road, or highway.

Driveway Crossing – Extension of sidewalk across a driveway that meets the requirements of ADAAG.

Encroachment – Items placed within the existing right of way by persons other than the Department's staff or authorized agents.

Edge of Travel Way – Roadway location on the outside edge of the edge line pavement marking. If an edge line is not marked, this location would be the edge of pavement.

Flag Lot – A large lot not meeting minimum frontage requirements and where access to a public road is by a narrow, private right-of-way or driveway.

Freeway – The highest level of arterial. This facility is characterized by full control of access, high design speeds and a high level of driver comfort and safety.

Frontage – The length of that portion of a property which directly adjoins a highway.

Frontage Road – A roadway used to control access to an arterial, function as an access facility to adjoining property and to maintain circulation of traffic on each side of the arterial.

Full Median Opening – An opening in a restrictive median that allows all turning and through movements to be made.

Functional Area of an Intersection – The area beyond the physical intersection of two roadways that comprises decision and maneuvering distance, plus any required vehicle storage length. It includes the length of road upstream from an oncoming intersection needed by motorists to perceive the intersection and begin maneuvers to negotiate it. The upstream area consists of distance for travel during a perception-reaction time, travel for maneuvering and deceleration, and queue storage. The functional area also includes the length of road downstream from the intersection needed to reduce conflicts between through traffic and vehicles entering and exiting a property.

Highway, Street, or Road – A general term denoting a public way for purposes of vehicular travel, including the entire area within the right of way. (Recommended usage: in urban areas – highway or street, in rural areas - highway or road).

Intersection Sight Distance – The sight distance required within the corners of intersections to safely allow a variety of vehicular access or crossing maneuvers based on the type of traffic control at the intersection.

ITE – Institute of Transportation Engineers (www.ite.org)

Local Roads and Street – All public roads and streets classified below the collector level.

"May" – see *"Shall," "Should," and "May."*

Median – The portion of a divided highway which separates opposing traffic flow.

Minor Arterial – A roadway that carries a mix of local and through traffic. It links Collectors, and sometimes Local Streets, with Principal Arterials.

MUTCD – Manual on Uniform Traffic Control Devices.

Outparcel – Any lot created from an overall tract wherein the remaining tract is larger than any single lot created and wherein the conditions and locations of access to such lot from a public highway or street may be restricted and/or provided through easements granted by the larger tract holder.

Speed: Operating – Operating speed is the highest overall speed at which a driver can travel on a given highway under favorable weather conditions and under prevailing traffic conditions without at any time exceeding the safe speed as determined by the design speed on a section-by-section basis.

Design Speed - Design speed is a selected speed used to determine various geometric design features of the highway. Generally, the design speed is 5 MPH greater than the posted speed limit of a roadway. Section 9.5.2 of the SCHDM discusses the selection of a design speed in general and Chapters 19 through 22 present specific design speed criteria for various conditions.

Posted Speed Limit **-** The posted speed corresponds to the value shown on regulatory signs as specified and described in the Manual on Uniform Traffic Control Devices. The posted speed is typically based on traffic and engineering investigations where statutory requirements do not apply. The selection of a posted speed is based on many factors including but not limited to: the 85th percentile speed, roadside development, curb and gutter, crash data, highway functional class, and median type.

Advisory Speed Limit – Speed advised to motorists for a comfortable speed to navigate a certain situation.

Street – See *Highway, Street, or Road*.

Traffic Control Device – A sign, signal, marking, or other device used to regulate, warn, or guide traffic, placed on, over, or adjacent to a street, highway, pedestrian facility, or shared-use path by authority of a public agency having jurisdiction

TRB – Transportation Research Board.

Two-Way, Left-Turn Lane (TWLTL) – *A* lane in the median area that extends continuously along a street or highway and is marked to provide a deceleration and storage area, out of the through traffic stream, for vehicles traveling in either direction to use in making left turns.

1E DESIGN EXCEPTIONS AND ACCESS WAIVERS

Recognizing that meeting the minimum criteria may not always be practical, the Department has established a process to identify and evaluate exceptions to geometric design criteria and access guidelines.

1E-1 Design Exceptions

An applicant can request a design exception when a proposed design does not meet AASHTO standards or the applicable criteria as given in the *SCDOT Highway Design Manual* (SCHDM). The “controlling” design criteria are highway elements that are judged to be the most critical indicators of a highway’s overall safety and serviceability. The designer must seek SCDOT design exception when the proposed design includes any of the following elements that do not meet the following criteria:

- Design speeds

- Horizontal alignment elements:
  - Minimum radii, and
  - Sight distance at curves based on level stopping sight distance (SSD)
- Vertical alignment elements:
  - K-values based on level SSD for crest and sag vertical curves
  - Maximum grades
  - Vertical clearances (without clearance for future overlay)
- Travel lane and shoulder widths
- Cross slopes for travel lanes and shoulders and Superelevation rates
- Clear roadway bridge widths
- Structural capacity of bridges
- Horizontal clearances to obstructions; and
- Stopping sight distances.

The standard form for Design Exception Requests can be downloaded from the SCDOT website at http://www.scdot.org/doing/pdfs/DsgExpReq.pdf .

1E-2 Access Waivers

If an applicant for an encroachment permit seeks a waiver from **access guidelines** provided in this manual, the request form contained in Appendix C shall be filled out and attached to the permit application. The request should provide justification and describe the undue hardship that will be placed on the applicant if a waiver is not granted. The Resident Maintenance Engineer (RME) should coordinate the waiver request with the District Engineering Administrator (DEA) and the appropriate office at Headquarters. A waiver will only be granted if it is determined that:

1. Denial of the waiver will result in loss of reasonable access to the site.
2. The waiver is reasonably necessary for the convenience and welfare of the public.
3. All reasonable alternatives that meet the access requirements have been evaluated and determined to be infeasible.
4. Reasonable alternative access cannot be provided.
5. The waiver will not result in any violations of pedestrian accessibility in accordance with the ADAAG

If a waiver is approved, the reasons for granting the waiver and any recommendations given by the Department shall be clearly stated and included in the Department files. Restrictions and conditions on the scope of the permit should be imposed as required in order to keep potential safety hazards to a minimum. The encroachment permit may contain specific terms and conditions providing for the expiration of the waiver if in the future the grounds for the waiver no longer exist.

7B-1 Case B – Intersections with Stop Control on the Minor Road

Where traffic on the minor road of an intersection is controlled by stop signs, the driver of the vehicle on the minor road should have sufficient sight distance for a safe departure from the stopped position assuming that the approaching vehicle comes into view as the stopped vehicle begins its departure. At a four-leg intersection, the designer should also check the sight distance across the intersection.

7B-1.1 Case B1– Left-Turn From the Minor Road

To determine the ISD for vehicles turning left onto the major road, the designer should use Equation 7.1 and the gap acceptance times (tg) presented in Table 7-11 for vehicles approaching from the left and right.

Table 7-12 and Table 7-13, which solve Equation 7.1, provide the ISD values for left-turning design vehicles onto a two-lane level facility and a four-lane with a two-way left-turn lane (TWLTL) level facility, respectively. The designer should also consider the following:

1) Multilane Facilities. For multilane facilities, the gap acceptance times presented in Table 7-11 should be adjusted (i.e., add 0.5 second for passenger cars or 0.7 second for trucks) to account for the additional distance required by the turning vehicle to cross the additional lanes or median.
2) Medians. The following will apply:
   - For a multilane facility which does not have a median wide enough to store a design vehicle, divide the median width by 12 feet to determine the lane value (e.g., for a 4-foot median use 0.33), and then use the criteria in Table 7-11 to determine the appropriate time factor.
   - On facilities with a median wide enough to store the design vehicle (e.g., 3 feet clearance at both ends of vehicle, see table with AASHTO design vehicle lengths below), the designer should evaluate the sight distance needed in two separate steps:

Design Vehicle Type	Overall Vehicle Length
Passenger Car	19 feet
Single-Unit Truck (SU)	30 feet
School Bus (S-BUS 40)	40 feet
Semitrailer (WB-62)	68.5 feet

     - First, with the vehicle stopped on the side road (the bottom portion in Figure 7-24), use the gap acceptance times and distances for a vehicle turning right (Table 7-11 and Table 7-12) to determine the applicable ISD. Under some circumstances, it may be necessary to check the crossing maneuver to determine if it is the critical movement. Crossing criteria are discussed in 7C-1.3.
     - Second, with the vehicle stopped in the median (top portion in Figure 7-24), assume a two-lane roadway design and use the adjusted gap acceptance times and distances for vehicles turning left (Table 7-11, Table 7-11, and Table 7-12) to determine the applicable ISD.

3) Approach Grades. If the approach grade on the minor road exceeds 3 percent, increase the level ISD value by 10 percent.

4) Design Vehicle. A passenger vehicle is used in most design ISD situations. However, at some intersections (e.g., near truck stops, interchange ramps, schools, grain elevators), the designer should use the design vehicle for determining the ISD. The gap acceptance times (tg) for passenger cars, single unit (SU) and tractor/semitrailer trucks are provided in Table 7-11. ISD values for level, two-lane roadways are presented in Table 7-12. The height of eye for these vehicles is discussed earlier in Section 7B.

Table 7-11: Gap Acceptance Times, Left Turns from Minor Road

Design Vehicle	Gap Acceptance Time (tg) (sec)
Passenger Car	7.5
Single Unit Truck (SU)	9.5
Tractor/Semitrailer	11.5

1. Multilane Highways. For left turns onto two-way multilane highways, add 0.5 second for passenger cars or 0.7 second for trucks for each additional lane from the left, in excess of one, to be crossed by the turning vehicle. Assume that the left-turning driver will enter the left-travel lane on the far side of the major road.
2. Minor Road Approach Grades. If the approach grade on the minor road exceeds 3 percent, increase the level ISD value by 10 percent.
3. Major Road Approach Grade. Major road grade does not affect calculations.

Table 7-12: Intersection Sight Distance, Vehicles Approaching from the Left and For Vehicles Approaching from the Right on a Two-Lane Highway or Street Only

Design Speed (Vmajor) (mph)	Intersection Sight Distance (Feet)		
	Passenger Car	Single-Unit Truck	Tractor/Semitrailers
30	335	420	510
35	390	490	595
40	445	560	680
45	500	630	765
50	555	700	850
55	610	770	930
60	665	840	1015

Note: These ISD values assume a minor road approach grade less than or equal to 3 percent. For grades greater than 3 percent, increase the ISD value by 10 percent.

INTERSECTION SIGHT DISTANCE QUICK REFERENCE TABLE

	Type of Turn from Minor Road		
Type of Roadway	**Right Turn**	**Thru Movement**	**Left Turn**
Two - Lane Highway *	Table 7-12	Table 7-15	Table 7-12
Three - Lane Highway * ^	Table 7-12	Equation 7.1 with Table 7-14 for t_g	Equation 7.1 with Table 7-11 for t_g
Four - Lane Highway *	Table 7-12	Equation 7.1 with Table 7-14 for t_g	Equation 7.1 with Table 7-11 for t_g
Five - Lane Highway * ^	Table 7-12	Equation 7.1 with Table 7-14 for t_g	Table 7-13
Six or More Lanes	Table 7-12	Equation 7.1 with Table 7-14 for t_g	Equation 7.1 with Table 7-11 for t_g

* - Assumed 12' Lanes

^ - Assumed 15' Median

If assumptions listed above are not correct - Equation 7.1 is to be used.

bounded by the sight area formed as shown in Figure 7-23. This information shall be determined on a local level by the Resident Maintenance Engineer or his designee.

I) Landscape lighting on the right-of-way shall be flush with the ground.

J) If in the future a plant's growth obstructs the view of signs or interferes with the sight distances of approaching traffic, the Department will require the applicant to remove, relocate, or prune the plants to eliminate this obstruction at his expense.

K) On a case-by-case basis, plantings may be allowed in sight triangle areas, but in these cases the plants must be kept to a maximum height of 2½ feet. Generally, all grass should be removed in these triangles and groundcovers planted.

L) All trees shall be de-limbed and kept limbless for the first 6 feet in height and up to 7 feet in height where trees are near pedestrian walkways.

M) Trees shall be selected and placed so that, even when they are fully matured, their limbs shall not overhang into the roadway and block vehicles. The applicant agrees that the trees shall be kept trimmed (not by or at the expense of the SCDOT), if this is required to keep limbs from overhanging into the road.

N) Crape Myrtles-The department recommends the planting of hybrid-type crape myrtles over the older indica-type. Many, but not all hybrid crape myrtles can be identified by indian-tribe names. We consider crape myrtles and fringetree to have a smaller than 4-inch diameter at maturity.

There are several trees available for planting on the right-of-way that we know will cause future problems. A complete list of trees not recommended for planting on SCDOT rights-of-way is provided on the SCDOT website. (See Appendix E for details). Some common examples are listed below:

A) Trees with weak wood. The tree's limbs break during storms. Examples:
- Silver Maple
- Bradford Flowering Pear-poor branching during life cycle
- Minosa
- Most pine tree types

B) Trees with forms that are unsuitable for many street tree-planting situations.
- Live Oak- form of tree (low limbs) may cause problems with vehicular and pedestrian traffic in rural planting situations and is a poor choice in urban street tree situations. The SCDOT usually request a setback distance in excess of minimum setback in this manual.
- Pin Oak-form of tree (low limbs that hang down at 45 degree angle) may cause problems with vehicular and pedestrian traffic. Also, note that this type of tree is pH sensitive.

C) Messy trees.
- Ginkgo trees - Avoid planting the female forms because the fruit is a nuisance.
- Sweetgum – The fruit is a nuisance and the tree is over planted; the new fruitless varieties haven't grown well in South Carolina.
- Tulip Poplar – Trees are huge and weak and leaves are a nuisance.

- Sycamore – Trees are enormous and overplanted. The leaves, fruit, and bark are messy and a nuisance.

D) Trees that decline and die after planting.

- Thornless Honeylocust- Poor choice for South Carolina's climate.
- Red Maples - Have a problem with the heat in this state; the named varieties are a little better but thought should be given to selection and placement

E) Some trees are planted where they should not be planted.

- Cabbage Palmetto- Tree is not suitable for planting throughout the state beyond the coast.
- In general, evergreen trees, such as Southern Magnolias, tree Hollies, Live Oaks, are not approved in urban street tree situations.
- Both Dogwoods and Redbuds are poor choices for urban street trees.

Additional information on landscaping is provided in Appendix E.

9E-2 Irrigation Systems

Irrigation systems for landscaping should be designed so that irrigation can be achieved without any system components encroaching on the right-of-way. When encroachment is unavoidable, details of the irrigation system shall be included in the landscaping plan. In any case, the landscaping plan shall detail provisions for the drainage of water used to irrigate the right-of-way. In no case shall water used to irrigate the right-of-way drain or be sprayed onto the roadway. The correction of any problem involving irrigation water draining or spraying onto the roadway will be the responsibility of the permittee, regardless of the Department's approval of the permit and landscaping plan.

9E-3 Offset of Trees and Shrubs

A tree or shrub that will attain a 4-inch or greater diameter at maturity (measured 4 inches above grade) shall have the edge of its trunk offset from the edge of the travel way a minimum distance as specified in Table 9-18. When a tree or shrub with multiple trunks or a group of small trees close together will have at maturity a combined cross-sectional area equivalent to that of a 4-inch diameter tree, it shall be offset likewise.

Landscaping work may be allowed on the Interstate system on a case-by-case basis. The FHWA's guidance on placement of landscaping features on the Interstates is as follows:

- Brick construction, fountains and ponds: 45 feet from edge of travel way
- Fencing (Breakaway PVC construction): 40 feet from edge of travel way
- Trees (ultimate trunk diameter over 4 inches in diameter): 45 feet from edge of travel way
- Small plants/shrubs: 30 feet from edge of travel way

For plantings on ramps, FHWA accepts a 5 feet reduction in the above listed dimensions for trees with an ultimate trunk diameter over 4 inches in diameter.

Table 9-18: Minimum Offset of Trees and Shrubs at Maturity

Roadside Feature	Roadway Design Speed	Offset from Edge of Travel way for Current Volume (ADT) of:	
		< 1,500	> 1,500
		ft.	ft.
Non-Interstate Routes			
Guardrail *	All speeds	4	4
Vertical face curb and gutter*	40 mph (60 km/hr) and less	1.5	1.5
	45 and 50 mph (70 and 80 km/h)	6	8
	55 mph (90 km/h)	10	12
6:1 or flatter cut slope ** (Metric 1:6)	40 mph (60 km/hr) and less	10	14
	45 and 50 mph (70 and 80 km/h)	14	18
	55 mph (90 km/h)	16	22
6:1 or flatter fill slope (Metric 1:6)	40 mph (60 km/hr) and less	10	14
	45 and 50 mph (70 and 80 km/h)	14	18
	55 mph (90 km/h)	16	22
4:1 to 5:1 cut slope (Metric 1:4 to 1:5)	40 mph (60 km/hr) and less	10	14
	45 and 50 mph (70 and 80 km/h)	12	18
	55 mph (90 km/h)	14	20
4:1 to 5:1 fill slope (Metric 1:4 to 1:5)	40 mph (60 km/hr) and less	12	16
	45 and 50 mph (70 and 80 km/h)	16	24
	55 mph (90 km/h)	20	26
3:1 cutnslope (Metric 1:3)	40 ph (60 km/hr) and less	10	14
	45 and 50 mph (70 and 80 km/h)	10	14
	55 mph (90 km/h)	10	16
3:1 fill slope*** (Metric 1:3)	40 mph (60 km/hr) and less	12	16
	45 and 50 mph (70 and 80 km/h)	16	24
	55 mph (90 km/h)	20	26
Interstate Routes			
Without Guardrail	All speeds	45 (for trees ≥ 4" caliper at maturity)	
	All Speeds	30 (for trees ≤ 4" caliper at maturity)	
With Guardrail	All speeds	4	

* Where vertical face curb or guardrail exists, offset is measured from face of curb or guardrail. Please note that a vertical face curb and gutter in the median does not allow a 4" or greater diameter tree to be planted

**Use for all medians with curbing.

*** The 3:1 fill slope is not to be used as part of the offset distance. Proper offset should be achieved by utilizing the distances specified as a total offset measured before and after the 3:1 fill

CHAPTER 10 — DRAINAGE

10A GENERAL REQUIREMENTS

Each access point shall be constructed in a manner that prevents water from flowing onto the roadway and from adversely affecting the existing storm drainage system. For example, driveways and paved areas sloping down toward the roadway should have provisions for water to be intercepted off the right-of-way and shall not have a low point within the shoulder break line. The driveway's slope between the shoulder break line and roadway edge shall be the same as the slope of the shoulder as specified in Chapter 3 subsection 3G-3.

10B DESIGN AND DISCHARGE

Drainage collected from off the right-of-way shall not be discharged onto the highway right-of-way unless discharge is approved by the Department's issuance of an encroachment permit. The applicant shall submit a drainage study that details the existing and proposed drainage for the site and compares the pre and post discharges at the point of release onto Department right-of-way. The applicant must follow the drainage design requirements as given in the latest edition of the SCDOT *Hydraulic Design Requirements*, which can be found on the SCDOT website at http://www.scdot.org/doing/pdfs/requirements.pdf.

Post-development release rates to the highway right-of-way for the 2-year, 10-year, and 25-year storm events shall be equal to or less than those calculated for the pre-development condition for the 2-year, 10-year, and 25-year storm events, respectively, as determined in accordance with Department design policy for the given site conditions. If the post-development discharges for the 2-year, 10-year, and 25-year

storm events exceed the pre-development discharges for the given storm event to the Department right-of-way, the applicant will be required to provide flow detention on site so that the pre-developed discharge condition is met. When the proposal is to connect directly to a SCDOT crossline pipe, the applicant will be required to meet the pre- and post-development rates for the 50-year storm if the roadway is a Primary (SC, US) or Interstate route. Details for detention structures and means of discharge, as well as design calculations, shall be approved by a registered professional engineer in compliance with Sections 40-21-10 and 40-21-30 of the Code of Laws of South Carolina (1976 as amended).

For cases where a driveway or new road intersects the state highway system, sag and catch basins will be required prior to the intersection to collect the water from the new road prior to the highway right-of-way in order to prevent flooding of the state highway system.

All of the aforementioned items shall be submitted with the Application for Encroachment Permit. Approval by a professional engineer or the Department does not preclude the need for compliance with any applicable federal, state, or local regulations or ordinances.

10C MAINTENANCE AND SAFETY CONSIDERATIONS

Pipes or ditches discharging into the highway drainage system shall join the system at an appropriate angle and have other provisions as necessary to prevent scour, erosion, or blockage of the existing drainage components.

The design of drainage structures shall be in conformance with the latest edition of the SCDOT *Standard Drawings*. New drainage components that would create maintenance problems or compromise safety shall not be permitted. These may include, but are not limited to, vertical wingwalls/headwalls, grates, pipes, and aboveground catch basin covers which are within 30 feet of the roadway. Curbing on driveways or streets shall not extend beyond the right-of-way line or ditch line when the driveway or street connects to a roadway not having curbing. Culverts shall extend at least the full distance from the toe of one side of a fill to the toe of the opposite side.

All drainage components shall conform to the existing roadway cross-section and profile. All structures shall be brought to a final grade flush with the existing profile and cross section. Catch basins are strongly discouraged in curved sections and within intersection radii.

Sediment and erosion control measures shall be shown on the application and constructed as the first phase of construction to prevent any sediment from reaching the highway right-of-way or drainage system.

10D NPDES CONSIDERATIONS

With the implementation of the Municipal Separate Storm Sewer System (MS4) permit, the Department is now responsible for the water quality of its storm water discharges. Therefore, the applicant will be required to be responsible for the water quality of their discharges if their encroachment permit is approved. The permittee must evaluate the SCDOT system they intend to discharge to and document whether or not that system discharges to a water body listed on the 303(d) Impaired water bodies list which can be found at www.scdhec.net/environment/water/docs/06_303d.pdf. If so, the applicant must determine what pollutant(s) the water body is/are impaired for. In

addition, the permittee must establish whether or not the system discharges to a body of water with a Total Maximum Daily Load (TMDL). If so, the permittee must ascertain what the pollutant(s) of concern is/are for that TMDL. South Carolina Total Daily Maximum Loads can be found at www.scdhec.net/environment/water/tmdl/tmdlsc.htm.

These analyses must be performed for both the construction and the post-construction phases of the project and the impacts to water quality of the impaired waters from the SCDOT system must be documented. The permittee must implement Best Management Practices (BMPs) if it is determined that the discharges will have adverse impacts to the impaired water body during either the construction or post-construction phases. The water quality analysis for the system in question must demonstrate that the selected BMPs meet the requirements of the TMDL. In addition, stormwater management devices and BMPs placed within SCDOT right-of-way should conform to SCDOT requirements. Applicants must also comply with all applicable federal and state storm water management and sediment and erosion control guidelines.

10E PERMIT APPLICATION REQUIREMENTS

The applicant's encroachment permit package for the hydraulic engineering reviews should include the following as a minimum:

- A statement by applicant that no work will begin until concurrence letter from DHEC or OCRM and any other governmental agency whose concurrence is required is received, if applicable,
- A set of detailed engineer's pre- and post-development drawings of the site that includes grading and drainage,
- Detailed hydraulic and stormwater management design studies that show the calculations, including a well-written narrative that explains existing conditions, they study, and what is to be done,
- A CD with the computer input and output files used by the engineer,
- A determination of whether of not the proposed construction causes any impacts to downstream roads, buildings, bridges, etc.,

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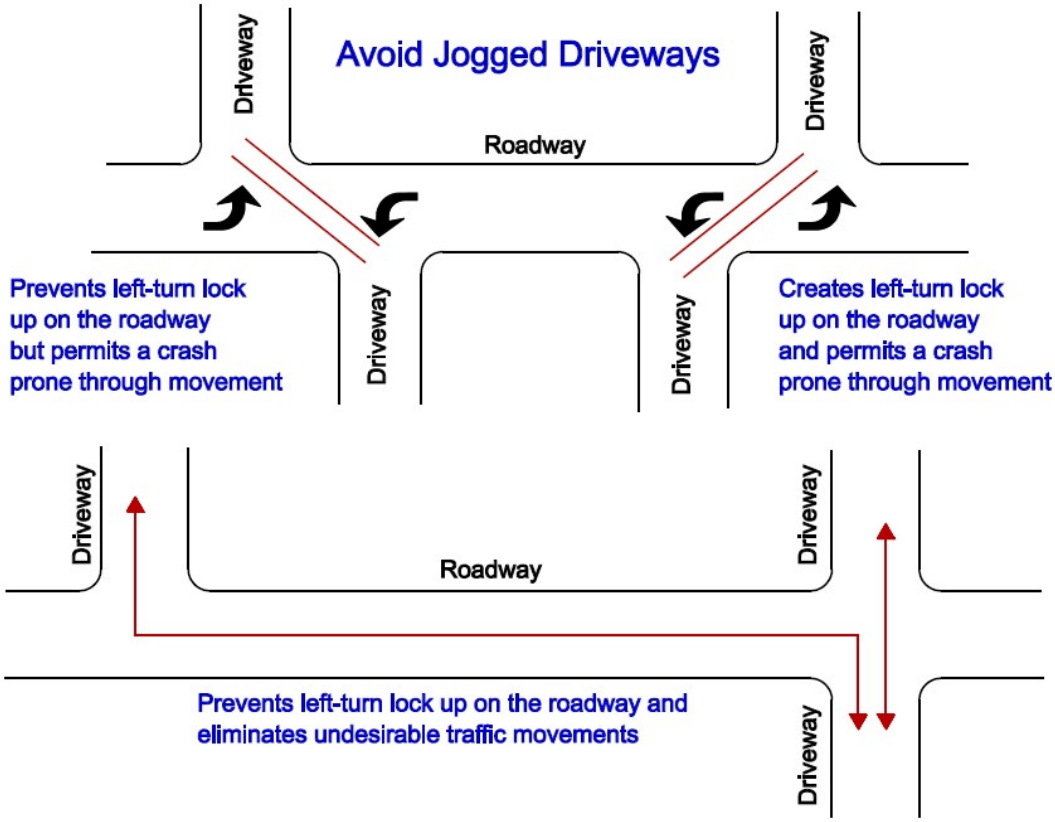
Avoid closely spaced driveways on opposite sides of an undivided roadway or roadway with a two-way left-turn lane (TWLTL) as they can allow undesirable traffic movements and turning conflicts (See Figure 3-8). The spacing of these drives should also follow the requirements set forth in Figure 3-7.

Figure 3-8: Driveway Connections on Opposite Sides of the Roadway



3C-2 Driveway Radius and Corner Clearances

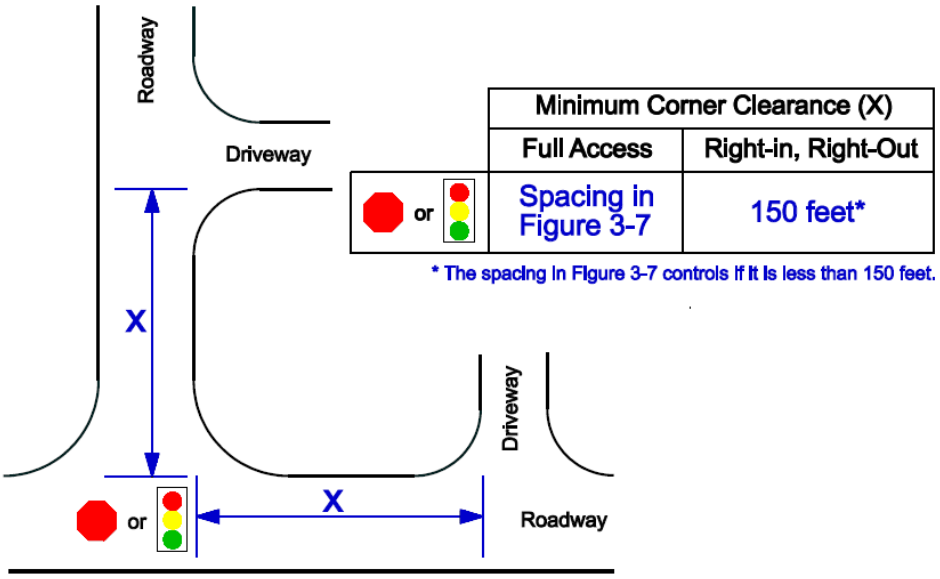
Corner clearance is the distance between a roadway intersection and the nearest driveway. The purpose of corner clearance is to remove conflicting movements from the functional area of intersections and provide sufficient stacking space for queued vehicles at intersections so that the driveways are not blocked. These requirements may limit or exclude driveways on some corner lot frontages. The minimum corner clearance for full access unsignalized as well as signalized intersections is the standard spacing from Figure 3-7. For right-in, right-out access, use a minimum of 150 feet or the value given in Figure 3-7if it is less than 150 feet.

Under no circumstances will a driveway connection be permitted within the corner radius of the intersection. In situations were large turn radii exist, the beginning of the radius of a driveway shall be at least 10 feet from the point of tangency of the intersecting roadway's radius.

In locations where left-turn lanes exist, these corner clearance distances may need to be increased as driveways should not be located where it is necessary for left turning vehicles to cross an intersection's left-turn lane. In situations where right turn

lanes exist at an intersection, driveways should not be located where exiting vehicles will enter the right turn lane.

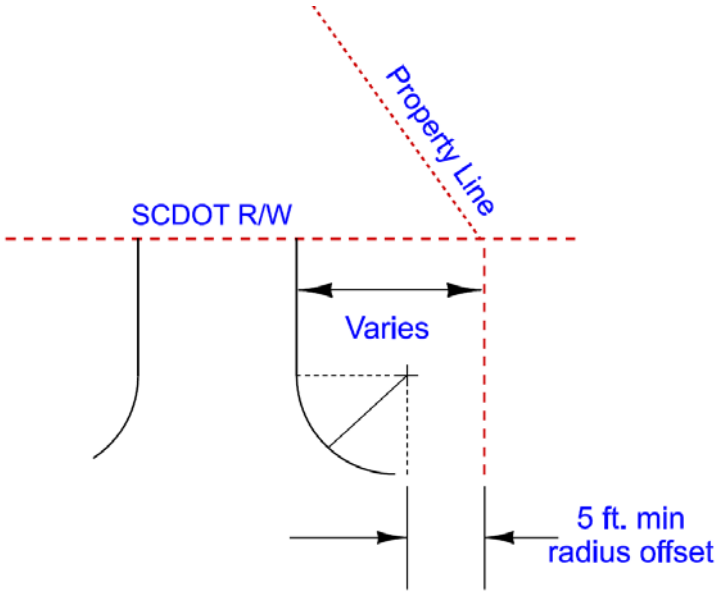
Figure 3-9: Corner Clearances



3C-3 Driveway Radius Offset

With the exception of residential driveways, driveways shall have a minimum radius offset of 5 feet, as measured parallel to the driveway, from the intersection of the right-of-way and property lines (Shown in Figure 3-10). If this is not feasible and the radius encroaches into the adjacent property's frontage located along the roadway, then it will be necessary for the permit applicant to obtain a letter of permission from the adjacent property owner(s).

Figure 3-10: Minimum Radius Offset Requirements



November 16, 2009

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2D-2 Land Use Changes and Redevelopment

When there is a change in land use that will affect the amount, type, or intensity of traffic activity to a site, the Department reserves the right to require submission of a new Application for Encroachment Permit. For example, a residential lot may be rezoned to allow for a professional office that will generate commercial traffic. In this case, the Department may require the existing access to be revised to better accommodate the expected traffic even if no significant building renovations are planned. In some cases, the number and/or width of driveways allowed may change depending upon the land use change and the current standards. The Department shall require that driveway locations being retained be rebuilt if the existing driveway violates ADAAAG. The Department shall require that driveways taken out of service be removed as a condition of granting access for a new land use. This provision will also apply to existing accesses when a property is redeveloped with the same general land use.

2D-3 Subdividing Large Parcels

Access to future subdivided parcels shall be considered in the initial Application for Encroachment Permit's review process. The Department will not be obligated to allow direct access for any parcels that may be subdivided from a larger overall development at a later date.

2D-4 Setback

The area to which the driveway provides access shall be sufficiently large for stopping, parking, and maneuvering of vehicles completely off the right-of-way.

2D-5 Maintenance Responsibilities

The owner shall be responsible for the maintenance of driveways and other access points, including any drainage structures, for areas within the rights-of-way of State maintained facilities. An encroachment permit is not required for routine maintenance such as mowing, patching potholes, clearing pipes and ditches, applying seal coating, and repairing minor erosion damage. The Department shall be responsible for the maintenance of permittee-provided crossovers, auxiliary lanes, and right-of-way.

2D-6 Retrofitting by the Department

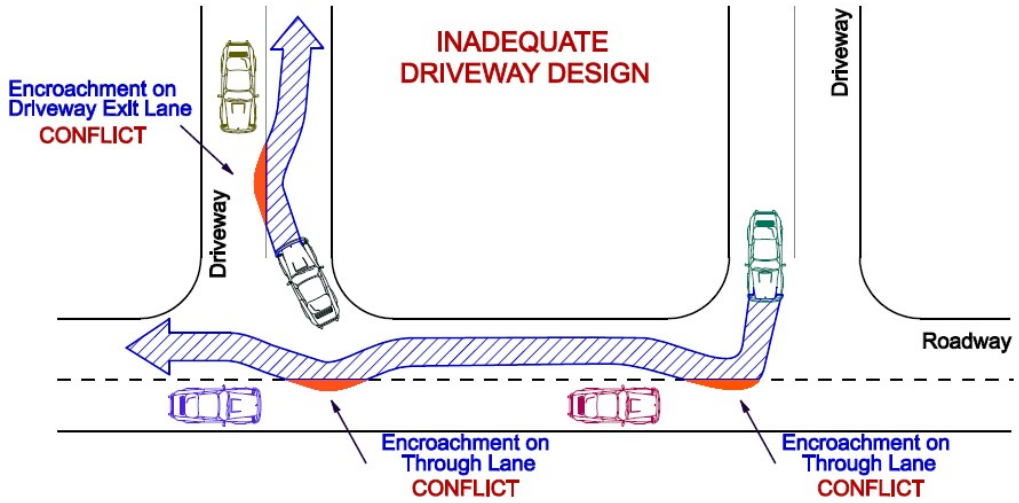
The Department may require driveway accesses to be modified to conform to these standards. This may require that some driveways be narrowed, widened, or removed in order to correct safety and operational problems. Preferably, such actions should be considered during the preconstruction phase. When this is required as part of a road improvement project, it will be done by the Department as part of the construction contract.

2D-7 Private or Commercial Use of Right-of-Way

Pursuant to Sections 57-7-210 and 57-25-10 of the *Code of Laws of South Carolina* (1976 as amended), erecting fruit and vegetable stands on the right-of-way, displaying automobiles for sale on the right-of-way, or any other private or commercial uses of the right-of-way are prohibited. Some exceptions, such as placing banners across the roadway, for which encroachment permits or letters of authorization have been issued in accordance with these standards are allowed. Businesses seeking to operate on sidewalk areas (e.g. sidewalk cafes, etc.) shall demonstrate that sufficient

One important goal of driveway design is adequately serving the entering and exiting maneuvers without encroachment into an opposing lane. The entry width is the most critical because it has to serve right turning and left turning vehicles and should be sufficient to allow a vehicle to enter without having to slow down nearly to a stop and allow a vehicles to enter and exit simultaneously. Inadequate driveway design creates conflicts that can be detrimental to safety and operations on the mainline (see Figure 3-3).

Figure 3-3: Inadequate Driveway Design



The width of driveways, exclusive of any shoulder, should be based on various conditions including the type of highway facility, the driveway volumes, the driveway alignment angle, and the turning radii. Driveway radii should be designed to provide safety and ease of vehicle movement for the largest vehicle that will regularly use the driveway. Table 3-4 indicates recommended driveway widths and minimum radii for various types of driveways based on the driveway class. For low to medium volume driveways in curb and gutter or sidewalk sections, drop curb driveways are typically used.

Table 3-4: Driveway Widths and Radii

Driveway Class	Driveway Width (feet)	Minimum Radius Returns (feet)
Low Volume	10 – 24	15
Medium Volume	24 – 40*	30 (40 Recommended)
High Volume	40**	**
Major Volume	**	**

* A 40 ft. driveway is usually marked with two exit lanes of 12 ft. width, with the balance of 16 ft. used for a single, wide entry lane. When a median divider is used, the throat width should be increased to maintain the same lane widths.
**Driveway widths, radii, and lane requirements are determined by a traffic study.
*** For one-way drives, use 14 to 24 feet depending on vehicle usage, width should not encourage two-way movement.

Without guidance, typical drivers will position themselves in the center of the drive, which causes conflicts with entering vehicles. The SCDOT recommends that all two-way driveways be marked to guide the driver to the correct portion of the drive, however; if the width of a driveway is 24 feet or larger pavement markings may be required at the Department's discretion. Driveways 36 feet or larger may require channelization.

Detailed design drawings for driveways with drop curb and for driveways with curb returns are given in *SCDOT Standard Drawings* Numbers 720-405-00, 720-410-00, and 720-415-00. These drawings can be accessed via the SCDOT website at the following address: http://www.scdot.org/doing/sddisclaimer.asp.

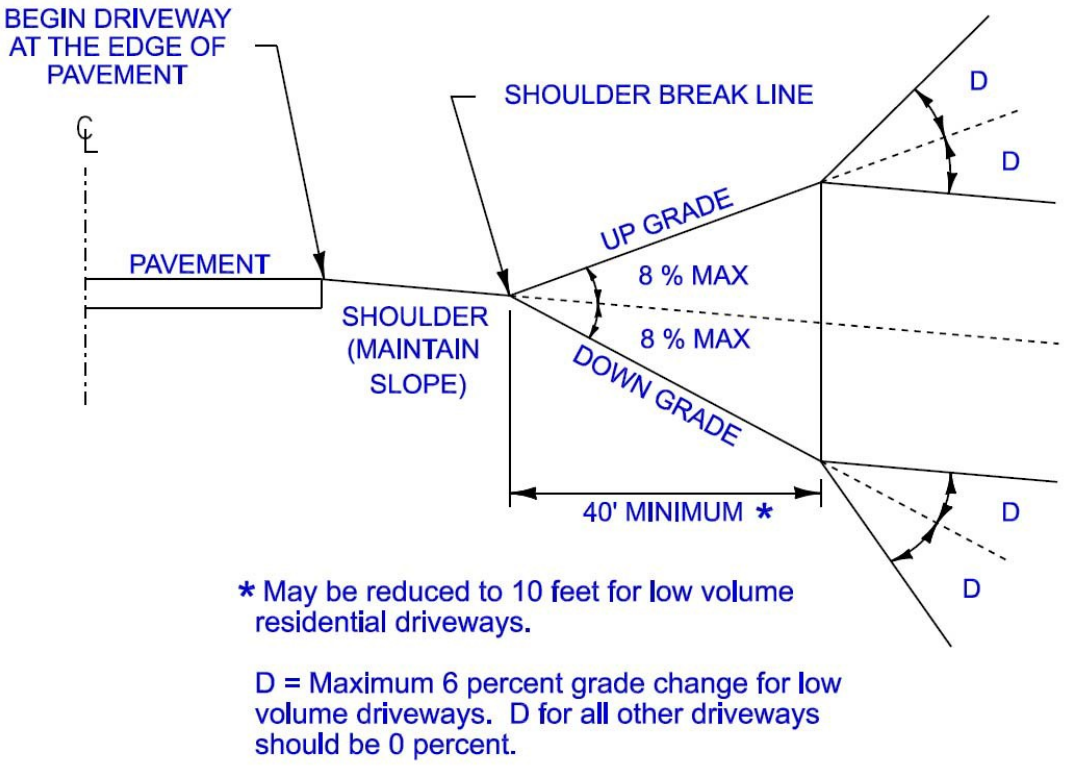
3B-3 Approach Grade and Side Slope for Low/Medium Volume Drives

Where a shoulder exists, the profile grade of the approach from the edge of the pavement shall slope at the same rate as the highway shoulder for the full width of the shoulder. As shown in

Figure 3-4, a difference in grade, not to exceed plus or minus 8 percent, shall be maintained from the edge of the shoulder for a minimum distance of 40 feet. Low-volume drives can have an additional grade change at this point not to exceed 14 percent total grade change from the shoulder grade. Also, driveways shall have a maximum side slope ratio of 4:1. These items should be clearly labeled on the driveway profile in the encroachment permit application.

High and major volume drives should be designed in accordance with Chapter 5 of this manual and Chapter 15 of the *SCHDM*.

Figure 3-4: Medium Volume Driveway Approach Grade



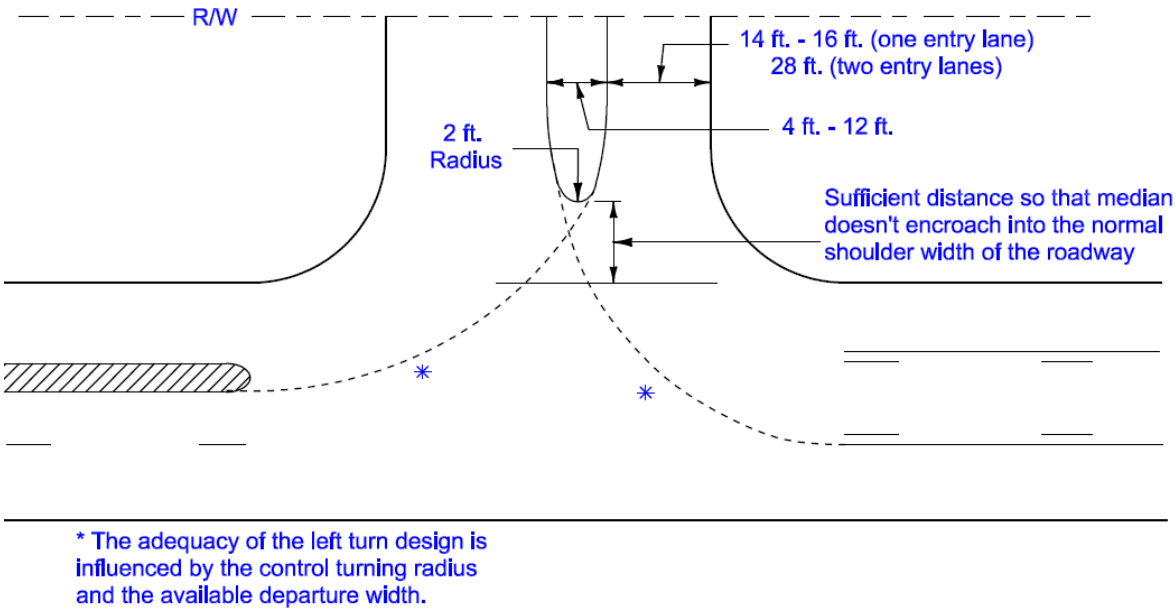
3B-5 Islands

Traffic islands are used to guide motorists into proper lanes and can be used for pedestrian access. They shall be used when the driveway characteristics or complexity is of such a nature that their use is needed to eliminate conflicts. They should be constructed with a mountable curb and should be offset from the traffic lanes. The minimum size of a raised concrete island is 100 square feet. Island used for pedestrian refuge should be at least 150 square feet. A diagram displaying the design requirement for triangular islands is given in Figure A-7 in Appendix A.

3B-6 Driveway Medians

When a median is used to separate opposing traffic on a driveway, the part of the median within the right-of-way shall have a minimum width of 4 feet and a maximum width of 12 feet. The median nose shall be offset a sufficient distance so that the median does not encroach into the normal shoulder width of the roadway. Landscape plants on the median and within 25 feet of the roadways should be limited to low growing plants not exceeding 2½ feet in height. These plants shall not negatively effect sight distance. When the median width is larger than 4 feet, the nose shall be defined with a 2-foot radius and the control turning radius. See Figure 3-6 below.

Figure 3-6: Driveway Median Design



3B-7 Right-in, Right-out Driveways

Right-in, right-out driveways are necessary in some locations in accordance with Section 3C. A right-in, right-out driveway should incorporate a triangular (pork chop) raised concrete island no smaller than 100 square feet with sides a minimum of 12 feet in length after rounding of the corners. A recommended typical design is shown in Figure A-7.1 in Appendix A. To determine if this design is adequate based on the type of vehicles the drive will serve, refer to Table 3-3, Table 3-4, and Figure 3-5 and adjust the design accordingly.

When a right-in, right-out driveway is implemented on an undivided roadway, the use of a restrictive median in concurrence with the "pork chop" island is preferred; however, adjacent impacts must be evaluated prior to implementing restrictive medians. A 4 foot wide raised concrete median is recommended. However, if a concrete median cannot be provided, consider the use of a Department-approved surface-mounted curbing system with flexible delineator posts as an alternative.

3C DRIVEWAY SPACING AND LOCATION

Driveways should be located to avoid undue interference with or hazard to traffic on the roadway. They should be located where there are no sharp curves or steep grades and where the provisions outlined in the following subsections are met. Driveways should not be located on auxiliary lanes or their tapers.

In the interest of public safety and convenience, the Department may restrict a point of access to a particular location along the frontage. On properties where driveways would not otherwise be clearly defined, a physical barrier such as curbing may be required along the frontage.

Generally, one driveway to a given property will be allowed, situated in a safe location and in accordance with the provisions of this manual. However, additional driveways may be allowed provided the spacing requirements in Figure 3-7 are met. Driveways will be limited to the number needed to provide adequate and reasonable access to a property. Factors such as alignment with opposing driveways and minimum spacing requirements will have a bearing on the number of driveways approved. A residential property with a frontage of less than 50 feet or a commercial property with a frontage of less than 64 feet will be permitted a point of access only upon special consideration by the Department. A property with more than one frontage may have the frontages considered separately.

3C-1 Driveway Spacing

Separating driveways can reduce the potential for conflict and minimize collisions. Figure 3-7 provides the minimum driveway spacing based on the speed and AADT of the adjacent roadway and is measured from near edge to near edge of adjacent driveways as shown in the figure. **Driveways generating more than 50 peak hour trips based on the most recent version of the *ITE Trip Generation Manual* shall use the larger of the two spacing requirements regardless of the adjacent roadway AADT**. Examples of facilities generating greater than 50 peak hour trips are provided in Appendix F. Driveway spacing should reflect the future AADT if a significant change will result from the development as determined by the District Traffic Engineer. High and major volume driveways that act as local streets should align with driveways on the opposite side of the street or should be offset in the same manner as streets as governed by Chapter 5 of this manual and the *SCHDM*. Minimum spacing will be increased if right-turn deceleration lanes are required and shall equal the length of the turning lane and taper plus 50 feet.

A pair of one-way driveways may be substituted only if the internal circulation on the site is compatible with the one-way driveways and wrong-way movements on the driveways are rendered impossible or extremely difficult for motorists. Nowhere shall a distance of less than 40 feet between edges of one-way driveways be permitted. (See Figure A-1 in Appendix A).

4E ROADWAY WIDENING IMPROVEMENTS

Implementing roadway improvements at and adjacent to new schools is an essential part of the overall site design. Since schools generate high traffic volumes during take-in and dismissal times, they often create heavy congestion at their drives and adjacent intersections (especially when these times coincide with peak traffic demands of non-school traffic along the highway). Additionally, school driveways generate high volumes of turning traffic, which can interfere with the safe and efficient movement of traffic along a roadway. In most cases, the SCDOT recommends construction of turning lanes at new school sites on a statewide basis. Turn lane lengths and taper lengths used should be in accordance with Figures A-9 and A-10 in Appendix A. Widening may also be recommended at adjacent intersections if the traffic introduced by a new school, or school addition, creates a more hazardous condition or is projected to cause a failure in the safe and efficient traffic operation of that intersection. When widening is necessary, the methods presented in Figures A-9 and A-10 in Appendix A should be used.

4F MISCELLANEOUS RECOMMENDATIONS

- The area where students are dropped-off and picked-up should be located separately from bus loading/unloading operations. This is accomplished by constructing loops and driveways that function separately.
- Automobile and bus loop traffic should circulate in a counterclockwise direction so that student loading and unloading occurs from a vehicle's passenger side next to the curb.
- Parking stalls placed along loop drives should be constructed in an angle type fashion to facilitate a one-way traffic flow pattern and discourage wrong way use.
- School buildings should be set back on a site a sufficient distance from the adjacent roadway to insure safe and adequate on-site storage for the stacking of loading and unloading vehicles.
- Pedestrians and bicyclists shall have a designated safe path between any road and the school building.
- The layout of the bus circulation and parking areas shall be designed to prohibit the backing-up of buses on a school site.
- Parking stalls for a full-size bus shall be a minimum of 15 feet wide. Smaller spaces may be provided for mini-buses and other specifically sized vehicles used to transport students.
- Student parking areas shall be separated from staff/visitor/bus parking and student loading/unloading areas.

capture and pass-by trips, transit use, and transportation demand management should be justified and documented. All trip generation and trip reduction calculations and supporting documentation shall be included in the report appendix.

6. **Trip Distribution and Traffic Assignment -** The distribution (inbound versus outbound, left turn versus right turn) of the estimated trip generation to the adjacent street network and nearby intersections shall be included in the report and the basis should be explained. The distribution percentages with the corresponding volumes should be provided in a graphical format.
7. **Analysis and Estimate of Impact -** A capacity analysis should be performed at each of the study intersections and access intersection locations (signalized and unsignalized) in the vicinity of the development. Intersection analysis shall include LOS determination for all approaches and movements. The levels of service will be based on the procedures in the latest edition of Transportation Research Board's *Highway Capacity Manual*. Coordination analysis will be required for the signal systems or portion of the signal systems analyzed.
8. **Access Management Standards -** The report shall include a map and description of the proposed access including any sight distance limitations, adjacent driveways and intersections, and a demonstration that the number of driveways proposed is the fewest necessary and that they provide safe and efficient traffic operations.
9. **Traffic signalization**: If a traffic signal is being proposed, a signal warrant analysis shall be included in the study. The approval of a traffic signal on projected volumes may be deferred until volumes meet warrants given in the MUTCD. The developer should make any laneage improvements during construction so that if in the horizon year a signal is warranted, one may be installed with little impact to the intersection.
10. **Mitigation and alternatives -** The traffic impact study should include proposed improvements or access management techniques that will mitigate any significant changes in the levels of service. The DTE will be responsible for final determination of mitigation improvements required to be constructed by the applicant.

The applicant shall provide all supporting information to the department. Electronic copies of supporting data may be submitted along with printed documents and could expedite the review process. This information may include traffic volumes, capacity analysis, and signal warrant analysis files from software packages. The electronic files that are submitted should be named to identify the contents.

When conditions indicate that there is no need to prepare a TIS, the developer may submit a waiver request to the DTE explaining the purpose of the waiver and providing the necessary supporting information.

The following checklist is used by the SCDOT in the review process and can aid in the preparation of a traffic impact study. This checklist shows the minimum requirements for a traffic impact study to be complete and does not certify or guarantee adequacy or approval. The DTE may require additional requirements during the review process, or during the initial meeting with the developer. Incomplete traffic studies will not be reviewed and will be immediately returned to the permittee.

8B-1 Traffic Signal Requests

If a permittee is requesting a signal as part of their access, a study should be prepared by their traffic engineer at the permittee's cost and submitted to the SCDOT for review. An engineering study of traffic conditions, pedestrian characteristics, and physical characteristics of the location shall be performed to determine whether installation of a traffic signal is justified at a particular location. The study should follow the guidelines outlined in the *SCDOT Traffic Signal Design Guidelines* and the *MUTCD*. Any trip generation should also be in conformance with the *ITE Trip Generation Manual* or other accepted standard. Engineering judgment and rationale should also be applied to indicate that installing a traffic control signal would improve the overall safety and/or operation of the intersection.

The decision of whether a signal is approved is under the District Engineering Administrator's (DEA) authority.

8B-3 Design and Installation of Traffic Signals

Signal Plans shall be prepared under the supervision of a professional engineer registered in South Carolina. The signal plan shall be signed and sealed under the same engineer. They should include accurate depictions of pavement markings, signal head placement, span wires, right-of-ways, driveways, sidewalks, control of access, and also should indicate signal timings, speed limits, grades, route names and numbers, adjacent development, coordination details, etc. Plans and specifications should be made part of the driveway encroachment permit and submitted to the SCDOT for review. All costs associated with the design and installation shall be the responsibility of the developer unless otherwise specified by SCDOT Engineering Directive #2 which is provided in Appendix D.

SCDOT's Traffic Signal Shop shall inspect all traffic signal work and shall be notified before any traffic control signal is placed in operation. SCDOT's Traffic Signal Shop should also be included in any preconstruction conferences. Electronic cadd files of the signal plans shall be provided to the respective District Traffic Engineer (DTE).

8B-4 Traffic Signal Maintenance

Fiscal and maintenance responsibilities for traffic signal installations on the State Highway System are outlined in SCDOT Engineering Directive #2. This directive has been provided in Appendix D. The developer will be responsible for the recurring electric costs at the signal if it serves a private driveway.

8B-5 Mast Arms

The SCDOT's *Traffic Signal Design Guidelines* and SCDOT Engineering Directives #2 and #33 has established a policy indicating that SCDOT does not install or maintain mast arms for traffic signals, as indicated below:

> "Special equipment such as decorative poles or mast arms are not considered to be standard equipment and are to be paid for by the permittee or agent. If replacement for any reason is required, the Department will replace with standard equipment unless the requesting agency agrees to provide funding for special equipment."

Five copies of the following shall be included along with the application:

- Geotechnical Report
- Hydrology Report (required for structures crossing or conveying water)
- Construction Plans (22" x 36") including Traffic Control Plans and Contract Special Provisions
- Structural Design Calculations

The Geotechnical Report, Hydrology Report, Structural Design Calculations, Construction Plans, and Special Provisions shall be signed and sealed by a registered professional engineer, registered in the State of South Carolina. The title sheet of the construction plans must include a location map and state the firm or persons that will perform the construction inspection and certification to ensure that the Contractor's work is performed in accordance with the contract plans, special provisions, and the current edition of the *SCDOT Standard Specifications for Highway Construction*. The title sheet must also include any necessary municipality and/or county approval including any state or federal permits when applicable.

The application shall also include a letter indicating that maintenance of the structure is the responsibility of the Permittee, unless there is a signed agreement between the SCDOT and the Permittee stating otherwise.

After the completion of the construction, the Permittee shall provide the Department two copies (22" x 36") of the as-built construction plans. One copy shall be kept in the District and one copy forwarded to the As-Built Plans Office in Preconstruction Support to be scanned and placed in the SCDOT Plan Library.

12B PRELIMINARY COORDINATION

Prior to submitting a permit application that involves construction of significant sized or complex bridges, culverts, or retaining walls, it is recommended that the applicant contact the Structural Design Support Engineer at (803) 737-4814 to arrange a meeting to discuss the scope of the structural work. It is also recommended that the Applicant, prior to finalizing the required attachments for the permit application, provide preliminary plans and 95% Plans to the Structural Design Support Engineer for review and comment.

Appendix A

Drawings

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2008 EDITION

NOTES

1. 100 S.F. MINIMUM AREA OF CONCRETE ISLAND. 150 S.F. MINIMUM AREA OF CONCRETE ISLAND WHERE PEDESTRIAN ACCOMMODATIONS ARE REQUIRED. MINIMUM 12' SIDES AFTER ROUNDING OF CORNERS.
2. ON A ROAD WITH CURB AND GUTTER, OFFSET THE CONCRETE ISLAND A MINIMUM OF 4' FROM THE EDGE OF TRAVELWAY. ON A ROAD WITH SHOUUDERS, PROVIDE A MINIMUM OFFSET EQUAL TO THE SHOUUDER WIDTH.
3. CONSTRUCT THE CONCRETE ISLAND AND MEDIAN IN ACCORDANCE WITH SCOOT STANDARD DRAWINGS. ON CURB AND GUTTER ROADWAYS, ALL ADA-REQUIRED DESIGN ELEMENTS SHOULD BE INCLUDED IN ACCORDANCE WITH SCOOT STANDARD DRAWINGS.
4. THIS DESIGN MAY BE ADJUSTED AT THE DISCRETION OF THE DISTRICT TRAFFIC ENGINEER DEPENDING ON VARYING CIRCUMSTANCES AT INDIVIDUAL LOCATIONS SUCH AS WHEN ACCEUDECEL LANES ARE REQUIRED IN ACCORDANCE WITH THE SC HIGHWAY DESIGN MANUAL.

WHEN CURB IS DROPPED, REFER TO SCOOT STANDARD DRAWINGS FOR CURB TRANSITION DETAILS.

108'

PAINT EDGES OF CONCRETE ISLAND IN ACCORDANCE WITH STD. DWG. 630-215-00

28'

4" SOLID YELLOW LINE

40'

R3-2-24 AT 45 DEGREE ANGLE (REQUIRED WHEN RESTRICTIVE MEDIAN CANNOT BE USED)

4-6'

'Z BROKEN WHITE SKIP LINES WITH 5' GAP

25'

4'

25'

RAISED CONCRETE MEDIAN

&'

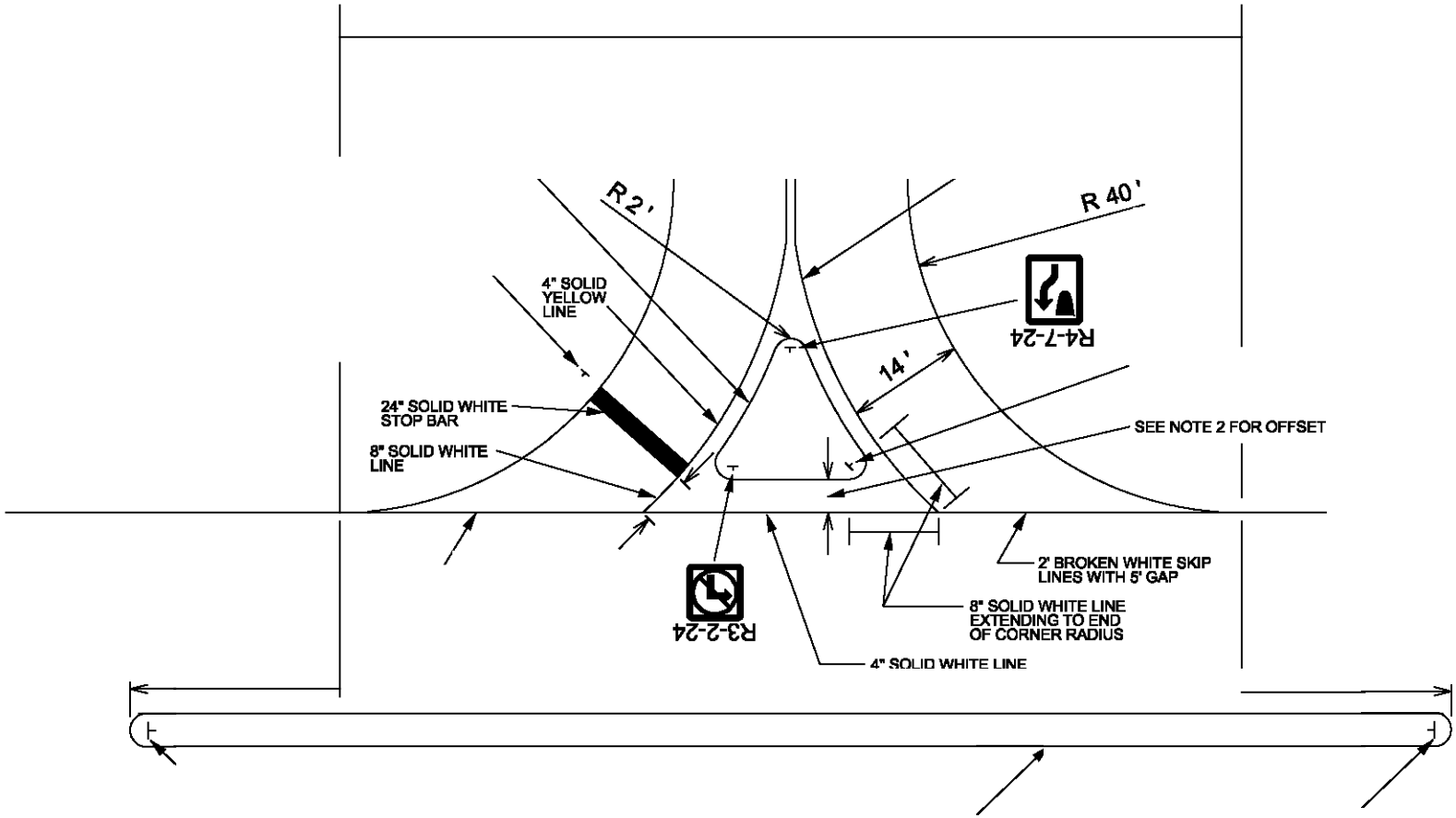
BLACK AND YELLOW STRIPED VERTICAL PANEL MOUNTED ON A FLEXIBLE DELINEATOR POST

PAINT EDGES OF CONCRETE MEDIAN IN ACCORDANCE WITH STD. DWG. 630-215-00

BLACK AND YELLOW STRIPED VERTICAL PANEL MOUNTED ON A FLEXIBLE DELINEATOR POST

UI

TYPICA L RIGHT-IN RIGHT-OUT DRIVEWAY DESIGN



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22-26 ft

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-C

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1 19 ft

L

17 ft 17 ft 17 ft 17 ft

9=30° 2.8 ft

A = 16.4 ft N = L - 2.8 / 17

27.4 't.toneuvei"'Jng space

ETW

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ft ft ft ft

θ = 45°

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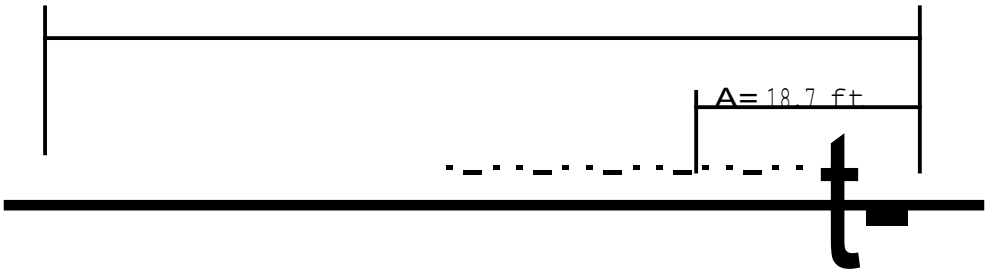
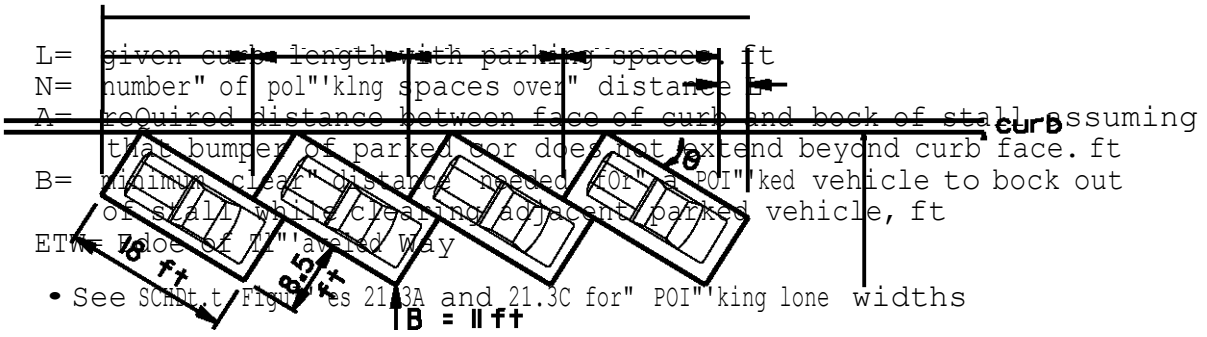
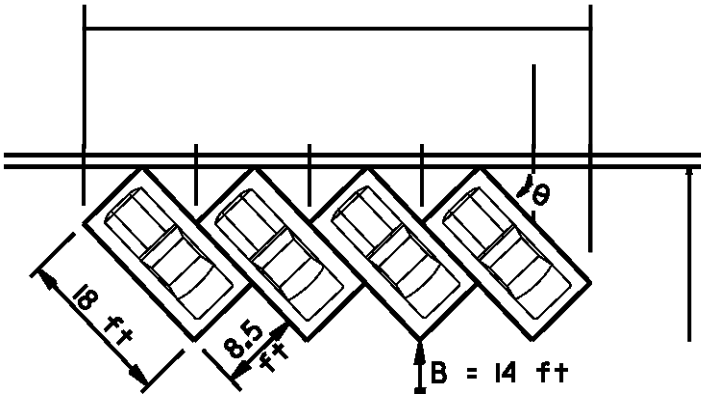




ON-STREET PARKING CONFIGURATIONS

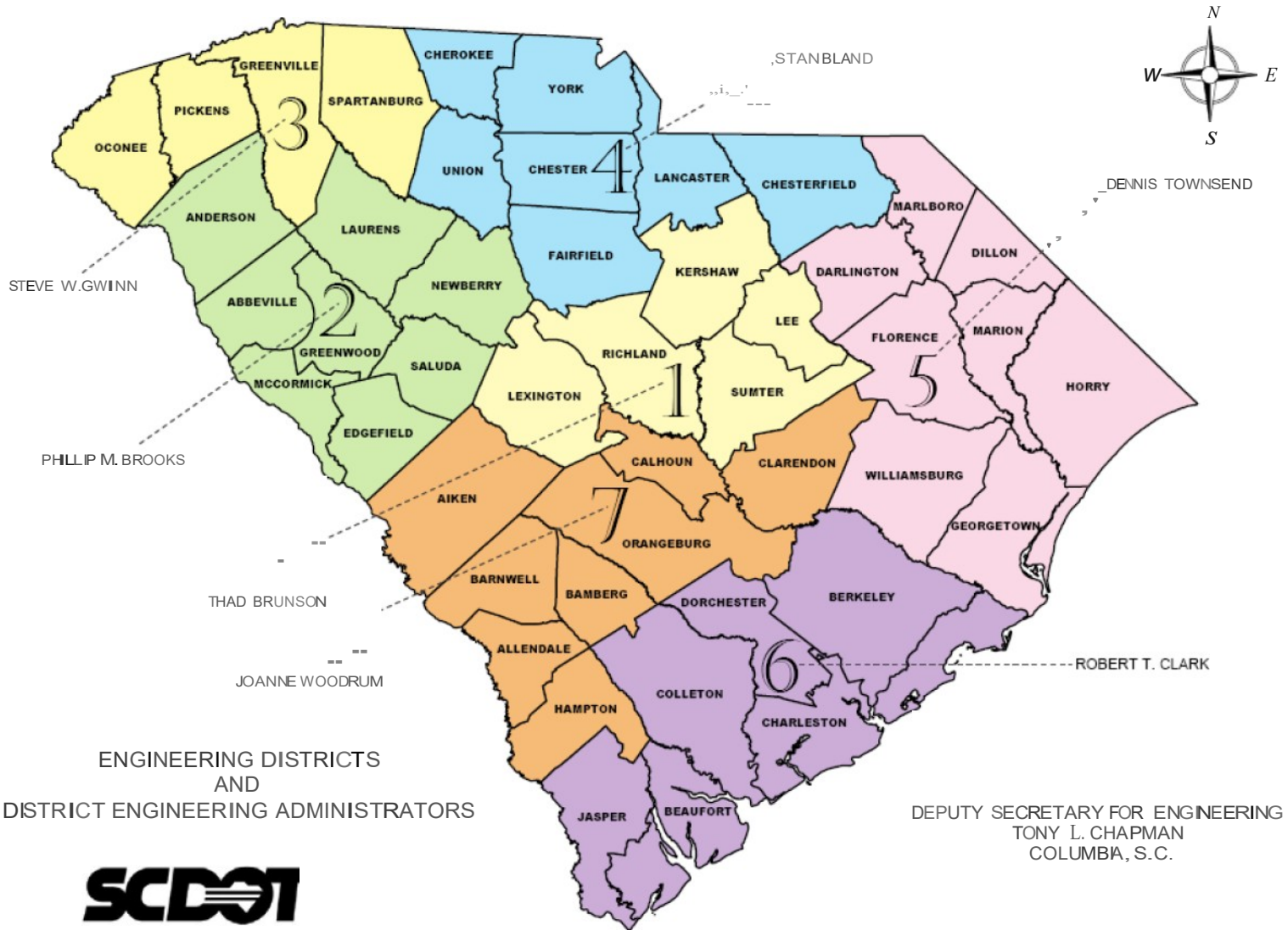
FIGUREA-11



SCI81 curb

South Carolina Department of Tnlnspoitetlon

Access and Roadside Management Standards



ENGINEERING DISTRICTS
AND
DISTRICT ENGINEERING ADMINISTRATORS

DEPUTY SECRETARY FOR ENGINEERING
TONY L. CHAPMAN
COLUMBIA, S.C.

August 18, 2011

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APPENDICES

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Table 2-2: Review of Applications

Permit	Recommendation From
Longitudinal utility encroachments on controlled access facilities	Preconstruction Support Office (HQ)
Railroad crossings	Preconstruction Support Office (HQ)
Bridge attachments	Maintenance Office (HQ)
Major reconstruction or relocation of state-maintained roads, including storm drainage, curb, gutter, and paving	Preconstruction Support Office (HQ)
School site plans or renovations	Traffic Engineering (HQ)
Interstate Commerce/Visibility Enhancement	Maintenance Office (HQ)
Within construction project limits	Resident Construction Engineer
Within project under development	Preconstruction Support Office (HQ)
Sidewalks/ Shared use paths/ ped crossings	Preconstruction Support Office (HQ)
Landscaping (Plant Type Selection)	Preconstruction Support Office (HQ)

2C PERFORMANCE BONDS

The Department may require a performance bond before issuance of an encroachment permit. Any such requirement shall be included in the special provisions of the permit, and evidence of the bond shall be attached to the permit. Coordination with the county or local government to determine the extent of their involvement may be necessary. The amount of the bond shall be equal to 1.5 times the estimated construction cost, or $5,000, whichever is greater. The purpose of such a bond is to ensure compliance with all terms of the permit by providing, in cases of noncompliance, for any and all damages and costs incurred in collecting damages through legal or other appropriate means. A bond shall be released only when the work described on the permit has been completed to the satisfaction of the Department.

2D CONDITIONS AND LIMITATIONS

2D-1 Traffic Safety and Operational Restraints

Safety, efficient traffic operations, and pedestrian accessibility are important considerations in the review of Application for Encroachment Permits. In some cases, it may be necessary to restrict access because of safety concerns or issues or operational restraints due to geometry, vertical grades, horizontal curves, or other conditions. Access at points within or near acceleration lanes or channelization may be restricted, limited, or prohibited. If operational or safety concerns exist, the application may be forwarded to the Director of Traffic Engineering for review.

Table 6-10: Guidelines for Determining the Need for an Impact Study

Land Use	100 Peak Hour Trips*
Single Family Home	90 units
Apartments	150 units
Condominiums/Townhouses	190 units
Mobile Home Park	170 units
Shopping Center – Gross Leasable Area (GLA)	6,000 sq. ft.
Fast Food Restaurant With drive-in – Gross Floor Area (GFA)	3,000 sq. ft.
Gas Station with Convenience Store	7 fueling positions
Banks w/drive-in (GFA)	2,000 sq. ft.
General Office	67,000 sq. ft.
Medical/Dental Office	29,000 sq. ft.
Research & Development	71,000 sq. ft.
Light Industrial / Warehousing (GFA)	185,000 sq. ft.
Manufacturing Plant (GFA)	144,000 sq. ft.

*Rates/Equations used to calculate above thresholds are for the P.M. Peak hour of the adjacent street.

A TIS shall be under the direct charge of and sealed by a registered South Carolina Professional Engineer with expertise in traffic engineering. An impact study shall analyze traffic conditions for the existing year conditions, build-out year background "no build" conditions, and build-out year "build" conditions. The study will be used to assess the need for changes in traffic control devices and roadway improvements necessary to accommodate the new development traffic. The study must also justify the proposed access plan and demonstrate the effects of the development on public roadways. The developer of a site will be responsible for making roadway improvements and installing traffic control devices that may be necessary due to the impacts of the new development. These include impacts through the influence area of the development and not limited to those in front of the development. The Department may also require road improvements by the developer without a TIS.

9F UTILITIES

Public Utility lines may be located within the highway right-of-way provided they are constructed so as not to endanger the safety of persons or to interfere with the use of the highway. Utility lines over bridge rights-of-way must be at a height sufficient to accommodate bridge maintenance, improvements and reconstruction. The Department must approve such an encroachment. Applications from the utility companies are reviewed for acceptance using the latest edition of the Department's "A Policy for Accommodating Utilities on Highway Rights-of-Way" as a guide. A copy of this document is available from the SCDOT Utilities Office or online at http://www.scdot.org/doing/ua_policy.shtml.

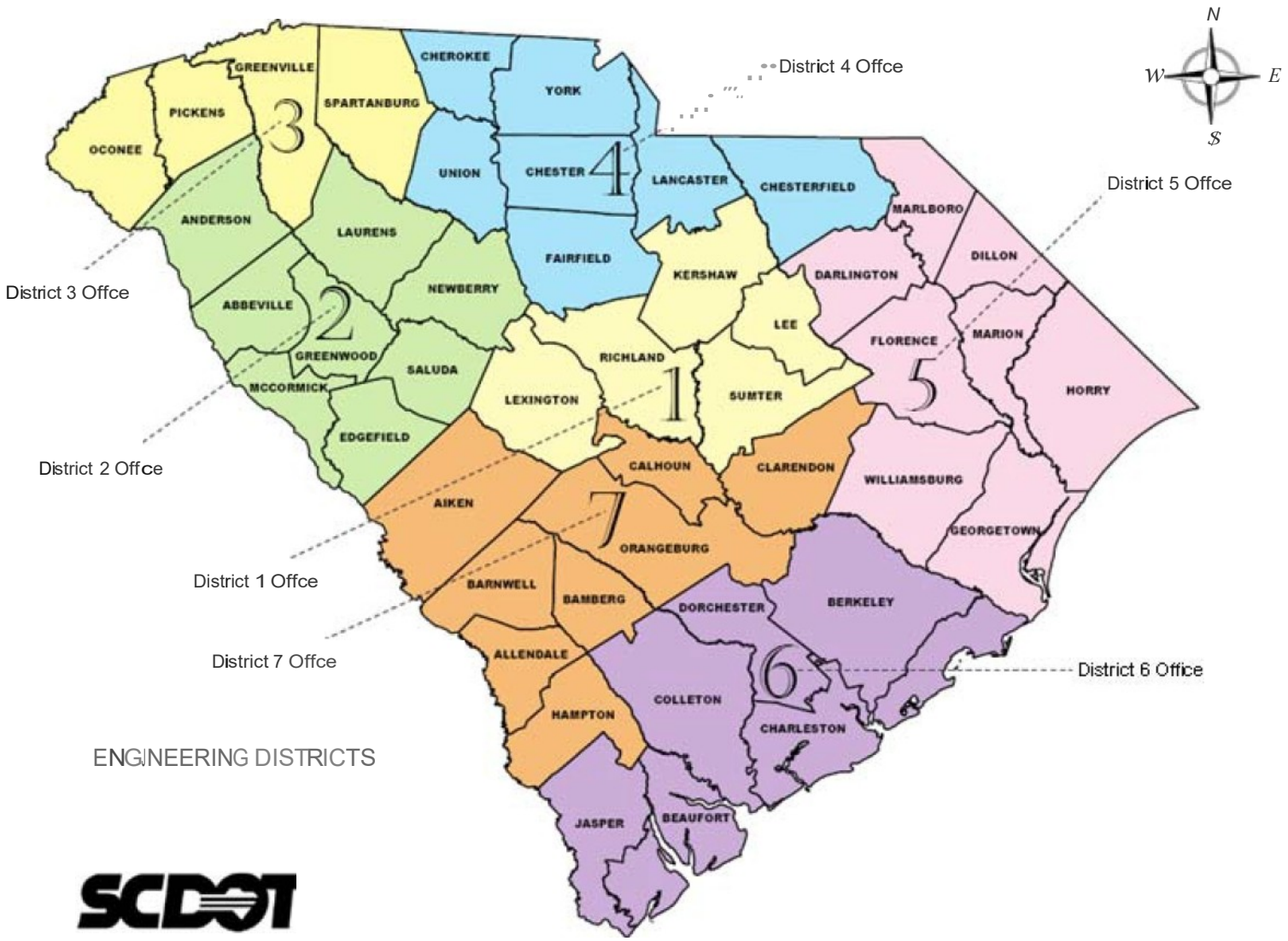
A permit will not be required for aerial service connections from an existing distribution line on Department Rights-of-way unless it is anticipated that there will be an interference with the normal flow of vehicular traffic on or along the highway or a new pole is to be placed on the Department's rights-of-way. Also, a permit will not be required for normal maintenance such as replacing existing poles, cables, pedestals, marker, etc. unless such repairs will entail alterations of normal traffic flow, or the maintenance activities require the relocation of the existing utility.

9G VISIBILITY ENHANCEMENT

Selective removal of vegetation for the purpose of making commercial and industrial sites more visible is governed by the Department's Engineering Directive 29. (See Appendix D)

9H HISTORICAL MARKERS AND BLUE STAR MEMORIAL HIGHWAY SIGNS

To install Historical Markers or Blue Star Memorial Highway signs on SCDOT right-of-way, an encroachment permit must be approved. The permit should indicate the location of the sign and include a copy of the sign approval letter from the South Carolina Department of Archives and History. SCDOT will not install the signs or take delivery of the signs from the manufacturer. Install the signs on single breakaway post or post/breakaway slip base coupling that has been tested and certified as meeting the requirements of NCHRP 350. Submit certifications for the breakaway post or post system as part of the encroachment permit. In urban areas or areas with curb and sidewalk, coordination with the District Traffic Engineer is required. If these signs are installed off SCDOT right-of-way, no permit is required.



ENGINEERING DISTRICTS

SCDOT

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Appendix F

Land Use	50 Peak Hour Directional Trips*
Single Family Home	45 units
Apartments	75 units
Condominiums/Townhouses	95 units
Mobile Home Park	85 units
Shopping Center – Gross Leasable Area (GLA)	3,000 sq. ft.
Fast Food Restaurant With drive-in – Gross Floor Area (GFA)	1,500 sq. ft.
Gas Station with Convenience Store	4 fueling positions
Banks w/drive-in (GFA)	1,000 sq. ft.
General Office	33,500 sq. ft.
Medical/Dental Office	14,500 sq. ft.
Research & Development	35,500 sq. ft.
Light Industrial / Warehousing (GFA)	92,500 sq. ft.
Manufacturing Plant (GFA)	72,000 sq. ft.

*Rates/Equations used to calculate above thresholds are found in the 7th *Edition of the ITE Trip Generation Manual* for the P.M. Peak hour of the adjacent street.