



PB99-169781

**MANUAL**  
**ON**  
**RULES AND REGULATIONS**  
**FOR**  
**CONSTRUCTING DRIVEWAYS**  
**ON**  
**STATE HIGHWAY RIGHTS-OF-WAY**

**July, 1999**

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1. Report No.		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle UPDATING THE DOH DRIVEWAY MANUAL				5. Report Date July, 1999	
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9. Performing Organization Name and Address Department of Civil & Environmental Engineering West Virginia University P.O. Box 6103 Morgantown, WV 26506-6103				8. Performing Organization Report No.	
12. Sponsoring Agency Name and Address Division of Highways WV Department of Transportation Capitol Complex, Building Five Charleston, WV 25305				10. Work Unit No. (TRAIS)	
15. Supplementary Notes Performed in Cooperation with U.S. Department of Transportation Federal Highway Administration				11. Contract or Grant No. WVDOH RP-111	
16. Abstract <p>The current edition of the West Virginia DOT Division of Highways (DOH) "driveway manual" was published in 1970. The current manual does not address certain key issues such as the permitting process, zoning, and signalization policies. It was felt to be desirable to update and revise the manual so that it provides better guidance to developers and others and to bring it into better conformance with, not only the current AASHTO standards, but also with traffic engineering practice.</p> <p>By reviewing relevant traffic engineering literature, driveway manuals from other states, and applicable laws, proposed changes to the current DOH driveway manual were identified. An Advisory Committee reviewed various drafts of the revised manual and offered constructive suggestions. The full text of the proposed manual (including figures) is included as an appendix to the report.</p>				13. Type of Report and Period Covered  Final Report	
17. Key Words Access Management, Driveways, Geometric Design, Site Impact Assessment				14. Sponsoring Agency Code	
19. Security Classif. (of this report) Unclassified		18. Distribution Statement		15. Supplementary Notes	
20. Security Classif. (of this page) Unclassified		21. No. of Pages 50		22. Price	



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## 1. INTRODUCTION

The standards contained in this manual are designed to:

1. Afford maximum protection to the traveling public
2. Ensure a uniform system of construction on state highway rights-of-way
3. Afford easy, safe ingress and egress to roadside establishments adjacent to the state's highways

These standards are based on the experience of the West Virginia Division of Highways (DOH) and recommendations of the Standing Committee on Highways of the American Association of State Highway and Transportation Officials (AASHTO).

## 2. OBJECTIVES

The safety and efficiency of a highway that does not have full control of access depends to a large extent on the amount and type of roadside interference with the movement of traffic. Vehicles entering, leaving, crossing, or standing near the roadway cause most of the roadside interference. Uncontrolled and/or indiscriminate access to the highway from roadside establishments seriously reduces the capacity of the highway and creates unsafe conditions.

These rules and regulations for constructing entrances to highways have been developed to provide for the orderly and safe movement of traffic into and out of private properties adjacent to the highway, including residential, commercial, and industrial properties. They set forth, in broad terms, reasonable restrictions on the owners of private property.

The specifications and figures contained herein are guides to the proper design of driveways. Critical minimum and maximum dimensions and general design features are shown; however, the multiplicity of possible situations will require an individual design for each situation. All designs must have the final approval of the DOH.

Instances arise wherein it is necessary to redesign and/or reconstruct a driveway to an existing roadside establishment or residence. Examples are:

1. The owner desires to renovate the property.
2. The DOH or other governmental agency requires changes to be made in the approaches due to highway construction, maintenance, or other similar work.

In such cases, strict adherence to these standards may not be practical. If necessary, a plan deviating from these standards may be approved. Such situations are discussed in Section 9.



### 3. LEGAL PROVISIONS

The Commissioner of Highways is charged by law with exercising “general supervision over the state road program and the construction, reconstruction, repair, and maintenance of state roads and highways.”

Specific laws contained in the Road and Motor Vehicle Laws of West Virginia (hereinafter referred to as “the Code”) provide authority for granting permission to enter upon or use the state highway for the purpose of constructing or reconstructing driveway approaches as follows:

1. **Chapter 17, Article 2A, Section 12**, pertains to promulgating and enforcing reasonable rules and regulations relating to setback lines, islands, curb separations, entrance approaches, walks, and parking.
2. **Chapter 17, Article 4, Sections 47-52 (inclusive)**, pertains to the location, design, and construction of access facilities to state highways from and to real property used or to be used for commercial, industrial, or mercantile purposes or from and to real property that is subdivided into lots.
3. **Chapter 17, Article 16, Section 6**, requires that a permit be obtained from the DOH for any work performed on state highway rights-of-way, including construction or reconstruction of any other driveway approaches not covered in Chapter 17, Article 4, Sections 47-52, cited above.

#### 4. APPLICABLE RULES AND REGULATIONS ADOPTED BY THE WEST VIRGINIA DIVISION OF HIGHWAYS

It is the policy of the DOH to permit, except on controlled access highways, access to state highways from all property abutting the highway right-of-way. The following conditions must be met for approval:

1. Provide reasonably efficient, rapid and safe movement of traffic.
2. Ensure appropriate public use of the highway.
3. Ensure proper drainage, maintenance, and repair.
4. Hold the state harmless and absorb all costs, liabilities, and damages that may occur as a result of work performed under an approved permit.
5. Abide by all laws, rules, regulations, and construction specifications pertaining to such work.

Rules and regulations promulgated by the Commissioner of Highways pertinent to the development of driveway approaches to property are contained in Appendix A. These should be reviewed and understood by the applicant.

## 5. INSTRUCTIONS FOR SECURING A DRIVEWAY PERMIT

Any applicant desiring to construct or reconstruct one or more driveways connecting with any state highway shall apply for a permit for such driveway(s) to the Office of the District Engineer with jurisdiction over the county where the property is located.

Application forms can be secured from DOH District Headquarters offices (listed in Appendix B), District Area Offices, County Maintenance Headquarters, or from the Director of the Maintenance Division in Charleston.

Five copies of the application form, with required drawings and/or plans attached, shall be submitted to the appropriate District Engineer. The proposed design will be reviewed for compliance and, if satisfactory, the application will be approved. One executed copy of the permit will be returned to the applicant.

If the design or location is not satisfactory, the applicant will be notified in writing of the objection(s). If agreement cannot be reached, the applicant has the right to a hearing.

Construction of a driveway which involves establishing a new railroad grade crossing or upgrading of an existing crossing will require that the applicant have an appropriate agreement with the railroad company involved. It will be necessary for the applicant to supply documentation of the legal status of the crossing, with the entrance permit application.

Applicants for commercial and industrial driveway permits shall submit, when requested, a performance bond in a form acceptable to the DOH. The amount of the bond shall be the next highest thousand dollars above 150% of the cost estimate for all construction within the highway right-of-way. If a bond is submitted, the DOH will be designated as the obligee and the permittee as principal. In instances where a certified check is submitted, the check shall be made payable to the Division of Highways.

## 6. DEFINITION OF TERMS

The definitions which follow are illustrated in Figures 1 - 3, inclusive. The illustrations are included only for this purpose.

### 1. Frontage

The length along the highway right-of-way line of a single property tract or roadside development area between the edges of the property; distance between (1) and (2) in Figures 1 and 2. Corner property at a highway intersection has a separate frontage along each highway.

### 2. Frontage Boundary Line (FB line)

A line, perpendicular to the highway centerline, at each end of the frontage, extending from the right-of-way line to the edge of through-traffic lane; line (1) - (4) or (2) - (3) in Figures 1 and 2.

### 3. Traveled Way

Normally considered as the paved portion of the highway, exclusive of paved shoulders.

### 4. Buffer Area

The area along the frontage between the back edge of shoulder or curb and the right-of-way line and within the frontage boundary line; area (1) - (2) - (3) - (4) in Figures 1 and 2.

### 5. Driveway Width (W)

Narrowest width of driveway measured parallel with the edge of traveled way; W in Figures 1 and 2.

### 6. Driveway Angle (Y)

The angle of  $90^\circ$  or less between the driveway centerline and the edge of the traveled way; Y in Figures 2 and 3.

**7. Edge Clearance (E)**

The distance measured along the edge of the traveled way, between the frontage boundary line and tangent projection of the nearest edge of driveway; E in Figures 1 and 2.

**8. Corner Clearance (C)**

At an intersecting street or highway, the dimension measured along the edge of the traveled way between the frontage boundary line opposite the intersection of the two right-of-way lines and the tangent projection of the nearest edge of driveway; C in Figure 3.

**9. Setback (G)**

The lateral distance between the right-of-way line and the roadside business building, gasoline pump curb base, display stand, or other object. The use of this will result in space for vehicles to stop or park between such facilities and the right-of-way line; G in Figure 2.

**10. Outside Radius (R)**

The outside or larger curve radius on edge of driveway; R in Figures 1, 2, and 3.

**11. Inside Radius (U)**

The inside or smaller curve radius on edge of driveway, used when Y is substantially less than 90°; U in Figures 2 and 3.

**12. Distance Between Double Driveways (D)**

The distance measured along the right-of-way line between the tangent projections of the inside edges of two adjacent driveways to the same frontage; D in Figure 2.

**13. Urban Cross Section**

Generally construed to mean areas within a municipality where the roadway is curbed. May also be applied to curbed locations outside municipalities.

**14. Rural Cross Section**

Areas where the traveled way is not curbed.

## 15. Sight Distance

Sight distance is defined as the distance measured between the height of a driver's eye and the height of an object without horizontal or vertical obstruction to the line of sight. For the purpose of measuring sight distance, the driver's eye height shall be 1070 mm (3.50 feet) above the proposed driveway surface and highway pavement surface and the vehicle's height shall be 1300 mm (4.25 feet) above the proposed driveway surface and highway pavement surface. The lateral placement of vehicles at the driveway and on the roadway shall be consistent with the operation of the driveway and roadway.

**Stopping Sight Distance:** This is the distance required by a driver traveling at a given speed to stop the vehicle after an object on the roadway becomes visible to the driver. For each direction along the highway, the shortest of the following lengths shall be measured sight distance for that direction along the highway as shown in Figures 4A, 4B, and 4C.

- (a) The maximum length of roadway along which a driver at a driveway location can continuously see another vehicle approaching on the roadway. The driver's eyes at a driveway location shall be 3.0 m (10 feet) back from the pavement edge (curb or edge of shoulder).
- (b) The maximum length of the roadway along which a driver on the roadway can continuously see a vehicle which is located in the driver's travel lane and which is intending to make a left turn into a driveway.
- (c) The maximum length of roadway along which a driver of a vehicle intending to make a left turn into a driveway can continuously see vehicles approaching from the opposite direction. This distance is measured from the location of the approaching vehicle to a point on the roadway where the left turning vehicle crosses the path of the approaching vehicle.

## 16. Median

That portion of a highway separating opposing traffic flows.

## 17. Acceleration Lane

A speed-change lane, including full-width auxiliary lane and tapered area, for purpose of enabling a vehicle entering a roadway to increase its speed to a rate at which it can safely merge with through traffic.

**18. Deceleration Lane**

A speed-change lane, including full-width auxiliary lane and tapered area, for purpose of enabling a vehicle leaving a roadway to decrease its speed to a rate at which it can safely diverge from through traffic.

**19. Right-of-Way**

A general term denoting land, property, or an interest therein, usually in a strip, acquired for or devoted to construction, drainage, operation, and maintenance of the roadway.

**20. Residential Driveway**

One providing access to a single-family residence, a duplex, or an apartment building having four or fewer units.

**21. Commercial Driveway**

One providing access to an office, retail, or institutional building, or an apartment building having five or more units. Truck traffic is an incidental rather than a principal driveway use.

**22. Industrial Driveway**

One directly serving a substantial number of truck movements to and from loading docks of an industrial or institutional facility, warehouse, or truck terminal. A centralized retail development, such as a community or regional shopping center, may have one or more driveways specially designed, signed, and located to provide access for trucks. These are classified as industrial driveways. Administrative or employee parking lots at industrial or institutional sites are considered as commercial driveways.

**23. Farm-Field Entrance**

One providing access to a field used for agricultural purposes.

**24. Temporary Driveway**

One used for a specific purpose for a limited period of time. Such driveways must conform to the standards and meet the practices contained in this manual. Temporary driveways must be removed after a specified time and the land restored to its original condition.

## **25. Island**

An island is a defined area between traffic lanes for control of vehicle movements. Islands also provide an area for pedestrian refuge and traffic control devices. It may range from an area delineated by a curb to a pavement area marked by paint.

## **26. Channelization**

The separation or regulation of conflicting traffic movements into definite paths of travel by traffic islands or pavement marking to facilitate the safe and orderly movements of vehicles and pedestrians.



## 7. GENERAL REGULATIONS

Any person or corporation desiring to construct a driveway or other access within the state highway right-of-way shall, before beginning any construction, have an approved permit from the DOH, authorizing construction on the right-of-way.

Failure to secure a permit prior to construction shall result in the removal of the driveway and/or denial of access at that location.

The driveway permit belongs to the occupant of the land. Any change in ownership or change in use of the property requires a new permit.

The applicant should note that the permit issued by the DOH in no way supersedes local zoning, building, or other permits or ordinances.

Approval of the application shall be subject to the following restrictions:

1. The applicant must represent all parties in interest. The permit shall be signed and issued **only** in the name of the owner(s).
2. Any driveway constructed by the applicant must be for the purpose of securing access to the property and not for the purpose of servicing, parking, or storing vehicles on the highway right-of-way.
3. No revisions or additions shall be made to the driveway(s) or its appurtenances on the right-of-way without the written permission of the DOH. These changes will be made at the applicant's expense.
4. Any changes, additions, repairs, and/or relocation of the driveway(s) or its appurtenances considered necessary because of, or to permit, the relocation, reconstruction, widening, or maintaining of the roadway shall be made by the DOH at its own expense.
5. The person, firm or corporation to whom a permit is issued agrees to hold the state harmless on account of any damages to person or property which may arise during the progress of the work authorized by this permit.
6. The location, design, and construction of the driveway(s) described above shall be in accordance with the standards contained herein.

## **8. GENERAL PRINCIPLES OF ACCESS MANAGEMENT**

### **8.1. Introduction**

“Access management” is a means of maintaining safe and efficient movement of traffic along roadways and streets by controlling the number and location of intersecting roads and driveways. It offers a way to strike a balance between the needs of land owners and the traveling public. The overall goal of access management is to provide adequate access to roadside property for use and development while simultaneously preserving the flow of traffic on adjacent roadways in terms of safety, capacity, and speed.

As urbanization expands, increased development along arterial highways generates more local traffic as well as greater demand for driveways and intersecting local roads to serve abutting and nearby businesses, industries, and neighborhoods. It has become increasingly apparent that the planning and design of both roadways and neighboring land uses must be coordinated. This will preserve the functional integrity of the highway system while allowing efficient access to and from abutting properties, and meet the desired land use objectives of local communities.

The purpose of these access management principles is to set forth guidelines which will maintain a high level of service for through traffic while providing reasonable access to abutting properties. Implementation of these principles will create a balance between public investments in highway improvement, operation, and maintenance and the need for land development.

### **8.2. Right-of-Way Use and Occupancy**

#### **8.2.1 General**

No part of the highway right-of-way is to be used for servicing, storing, or parking of vehicles; erecting displays of any kind; or conducting business. Parking may be permitted on the roadway, as at the curb on city streets, when permitted by police controls. The buffer area is to be kept clear of buildings, sales exhibits, business signs, parking areas, service equipment, and all appurtenances thereto. It may be graded and landscaped as approved by the DOH.

#### **8.2.2 Buffer Area and Setback**

1. A buffer strip should be provided along each lot's boundary with the traveled portion of the roadway having a width in proportion to building setback. The recommended dimensions are shown in Table 1.

Table 1. Buffer Area and Setback.

<b>Buffer Strip Width</b> meters <i>(feet)</i>	<b>Building Setback</b> meters <i>(feet)</i>
3.0 <i>(10)</i>	less than 22.5 <i>(75)</i>
4.5 <i>(15)</i>	22.8 - 34.5 <i>(76) - (115)</i>
6.0 <i>(20)</i>	34.8 - 45.0 <i>(116) - (150)</i>
7.5 <i>(25)</i>	45.3 or more <i>(151)</i>

2. In the development of the adjacent private property and the driveways thereto, the buffer area may require grading by filling or cutting. Such work shall be done in a manner that ensures safe stopping sight distance for traffic operation, proper drainage, suitable slopes for maintenance and mowing operations, and good appearance.
3. Existing trees, shrubs, ground cover or other landscape features may need to be removed or adjusted.
4. No portion of the parking lot should be located within the buffer strip (refer to Table 1). A "sight triangle" shall be formed by the intersection of the side of the driveway and the street curb or back of shoulder, extending 7.5 m (25 feet) in length along the side of the driveway and 7.5 m (25 feet) in length along the curb or shoulder, with the third side connecting the other two sides. Within each sight triangle, no landscape materials shall be planted, except those that will reach at maturity 750 mm (30 inches) or less in height above the exit driveway elevations.
5. The buffer area outside the driveways shall be constructed as necessary to deter ingress and egress by vehicles except at designated points. This may be accomplished by appropriate grading or by use of curbs, rails, guide posts, low shrubs, hedgerows, etc. in a manner that does not impair clear sight across the area and conforms with the current edition of the Roadside Design Guide published by AASHTO.

6. Improvements on private property adjacent to the right-of-way shall be so located that parking, stopping, and maneuvering of vehicles on the right-of-way will not be necessary in order for the patrons to be properly served.

### **8.2.3 Parking**

1. Each roadside business establishment shall provide sufficient parking or storage space off of the right-of-way to prevent the storage of vehicles on the driveway or the backing up of traffic on the traveled way. This is particularly applicable to businesses such as food service establishments, gas stations, drive-through banks, truck terminals, shopping centers, malls, and car washes, where a number of vehicles will be entering and/or leaving the area at one time.
2. A driveway shall not be approved for parking areas that require backing maneuvers within the state highway right-of-way. Such parking areas must include on-site maneuvering areas and aisles to permit vehicles to enter and exit the site in forward drive without hesitation.

### **8.2.4 Signing**

1. All advertising signs in conjunction with roadside establishments shall be placed outside the highway right-of-way, and shall comply with state and local laws and ordinances regulating outdoor advertising.
2. Signs shall be so positioned and mounted to not obstruct the driveway user's view along the highway.
3. Driveway signs, if installed, shall be maintained by the owner of the property.
4. The current edition of the Manual on Uniform Traffic Control Devices (MUTCD) should be followed when designing and installing signs along the driveway.

### **8.2.5 Median Openings**

1. No additional median openings will be permitted on divided highways to accommodate driveway openings.
2. Existing openings shall not be lengthened. Medians may be reconstructed to accommodate left-turn storage lanes if such is practical.

### 8.3 Sight Distance

1. Driveways shall be located to the extent feasible within frontage limits at the point of optimum sight distance along the highway.
2. Where a driveway is provided to a commercial establishment, the buffer area and adjacent setback shall be reasonably cleared so that either the establishment itself or an appropriate sign located outside the right-of-way can be seen at sufficient distance. This will enable drivers desiring to enter the establishment to make proper and safe maneuvers.
3. Sight distance for vehicles entering the highway from any driveway shall meet the minimum stopping sight distance for the operating speed on the adjacent highway as shown in Tables 2a and 2b and should be as long as can be justified economically.

The operating speed is normally assumed to be the posted speed limit. If a traffic study establishes that the operating speed is lower than the posted speed limit, then the lower speed may be used to determine the safe stopping sight distance.

4. The applicant is expected to perform whatever work is necessary within the property and frontage boundary lines to meet the minimum requirements specified in Tables 2a and 2b. If the minimum distances cannot be met by such work, a lesser distance may be acceptable as described in Section 9.

**Note:** The sight distance values in Tables 2a and 2b are for passenger vehicles and single-unit trucks only. If the driveway is classified as an industrial driveway, then additional sight distance shall be provided as recommended in the current edition of the AASHTO design policy.

Table 2a. Safe Stopping Sight Distances Required at Different Operating Speeds on Upgrades.

<b>SIGHT DISTANCE</b>						
meters (feet)						
<b>Average Grade (G)</b>	<b>0%</b>	<b>+ 2%</b>	<b>+ 4%</b>	<b>+ 6%</b>	<b>+ 8%</b>	<b>+ 10%</b>
<b>Speed (V) kph (mph)</b>						
<b>40 (25)</b>	45 (147)	44 (144)	44 (142)	43 (139)	42 (137)	42 (135)
<b>50 (30)</b>	60 (196)	59 (191)	57 (187)	56 (183)	55 (180)	54 (177)
<b>55 (35)</b>	76 (249)	74 (242)	72 (236)	71 (231)	69 (226)	68 (221)
<b>60 (40)</b>	96 (314)	93 (304)	90 (295)	88 (287)	86 (280)	84 (274)
<b>70 (45)</b>	117 (383)	113 (370)	110 (358)	107 (348)	104 (339)	101 (330)
<b>80 (50)</b>	141 (462)	136 (444)	131 (429)	127 (415)	123 (403)	120 (392)
<b>90 (55)</b>	164 (538)	158 (517)	153 (499)	147 (482)	143 (468)	139 (454)
<b>100 (60)</b>	190 (621)	182 (596)	175 (574)	169 (554)	164 (537)	159 (521)

Table 2b. Safe Stopping Sight Distances Required at Different Operating Speeds on Downgrades.

SIGHT DISTANCE						
meters (feet)						
Average Grade (G)	0%	- 2%	- 4%	- 6%	- 8%	- 10%
Speed (V) kph (mph)						
40 (25)	45 (147)	46 (150)	47 (153)	48 (157)	50 (161)	51 (166)
50 (30)	60 (196)	62 (201)	64 (207)	66 (214)	68 (221)	71 (230)
55 (35)	76 (249)	79 (256)	81 (265)	84 (275)	88 (286)	92 (299)
60 (40)	96 (314)	100 (325)	104 (338)	108 (352)	113 (369)	119 (389)
70 (45)	117 (383)	122 (398)	127 (415)	133 (435)	140 (459)	149 (487)
80 (50)	141 (462)	147 (481)	154 (504)	162 (531)	172 (563)	183 (600)
90 (55)	164 (538)	172 (562)	180 (590)	190 (622)	202 (661)	216 (706)
100 (60)	192 (621)	199 (650)	209 (683)	220 (721)	234 (766)	251 (821)

## 8.4. Driveways

### 8.4.1 Location

Driveways shall be located so that vehicles entering or leaving the establishment will not interfere with or create a hazard to the movement of traffic on the roadway. Where feasible, they shall be located where there are no sharp curves or steep grades and where sight distance is adequate for safe traffic operations. Driveways shall not be located within intersections, or adjacent turning radii. They shall be located so that they will not interfere with the placement of signs, traffic signals, or other devices that regulate traffic operations.

### 8.4.2 Number and Arrangement

1. The permissible number, arrangement, and widths of driveways shall be governed by the amount of roadway frontage abutting the private property and by the positions of the installations thereon.
2. Where driveways are provided to vacant land, they shall be located to give the best advantage to the roadway alignment, profile, sight distance conditions, and other related factors.
3. The number of driveways provided shall be the minimum number required to adequately serve the needs of the property. Frontages of 15.0 m (50 feet) or less should be limited to one driveway. Normally, not more than two driveways will be permitted to any single property tract or business establishment. Exception may be made when a traffic impact study indicates traffic operations would be enhanced by more than two driveways.
4. Where there are several adjacent roadside establishments, each with relatively limited frontage, or where there is probability of such development, consideration should be given to use of a "frontage road" paralleling the roadway to reduce the number of separate connections. Where border width permits, the several driveways should be connected directly to such a frontage road. Connections to the through roadway should only be at the extremities or along it at well-spaced intervals. Figures 5A, 5B, and 5C show techniques for reducing the number of driveways. Applicants whose development falls into this category should review Sections 10, 13, and 15.
5. Driveways shall be positioned to clear the frontage boundary lines by a specified minimum dimension (see Section 10.6). Where two or more driveways are provided for one frontage, the clear distance between driveways measured along the right-of-way line should not be less than the specified minimums as shown in Figures 6, 7, and 8.



6. At an intersection of two roadways, driveways connecting each roadway with a corner property may be permitted when it is essential to the conduct of business on the corner tract. Such driveways must comply with location regulations (see Section 8.4.1) and not be closer than the minimum corner clearance from the intersection.

Under urban conditions and elsewhere, particularly where traffic in relation to capacity is high, the corner clearance on the approach to the intersection should be greater than that on the far side of the intersection. This provides more space for storage of vehicles that are waiting for openings in cross traffic or for a green traffic signal and reduces instances of blocking the driveway.

7. The location and design of signalized access points will be determined by a traffic impact study (refer to Section 15).

#### **8.4.3 Width and Edge Radius**

1. The driveway width shall be adequate to properly handle the anticipated volume and type of traffic. It shall be within the limits specified for the particular conditions and types of roadside establishments.
2. The maximum widths permitted by the standards are considered ample for all conditions. Where driveway widths narrower than the maximum permitted will adequately handle anticipated traffic, such narrower widths should be provided.
3. Where space permits, the radius of the curve connecting the edge of the through-traffic lane and the edge of the driveway should be the minimum radius necessary to permit turns by the largest vehicle frequently expected based on the AASHTO design policy.
4. The combination of driveway width and edge radius of smaller dimension should be adequate for narrow frontage conditions.
5. The radii for driveways on streets on which there are outer parallel parking lanes should be based on turns to and from the edge of the through lane based on the AASHTO design policy.

#### **8.4.4 Channelization**

1. Channelizing or divisional islands for high-volume driveways may be used to prevent egress traffic from encroaching upon the side of the drive used by ingress traffic. This ensures that the ingress traffic has the necessary maneuvering space. It also reduces the number of conflict points and increases the turning velocity.

#### 8.4.6 Surfacing

Driveways should be paved between the traveled way and the service area.

**(a) Commercial and Industrial**

When the traveled way is paved, all driveway approaches classed as commercial must be paved. Paving must extend back from the pavement edge a minimum distance equal to the largest radius. For example, a 7.5 m (25 feet) radius requires the approach to be paved at least 7.5 m (25 feet) from pavement edge. In any case, it must be at least 3.0 m (10 feet). Pavement for driveway approaches shall be equal to or greater than either of the following:

- (i) 150 mm (6 inches) of bituminous concrete on 200 mm (12 inches) of compacted gravel or stone.
- (ii) 200 mm (8 inches) of concrete on 150 mm (6 inches) of compacted stone.

**(b) Residential and Farm**

Driveways to residences or farms need not be paved, although pavement or gravel stabilization is highly desirable.

**(c) Heavy Equipment**

Where trucks will be hauling logs, heavy mining or drilling equipment, etc., the approach shall be stabilized with at least 200 mm (8 inches) of gravel for a minimum distance of 30.0 m (100 feet) from the roadway pavement.

#### 8.5 Internal Circulation

1. Proper design and operation of property development should include preventing spillover of traffic conflicts that occur inside the property onto the abutting roadway.
2. Internal design should facilitate the distribution of vehicles by providing clearly defined circulation facilities.
3. Internal circulation shall be designed to minimize the interference between entering and crossing vehicles. It must also provide sufficient storage space so that queuing of entering vehicles will not back-up into the roadway.
4. A well-designed internal circulation system will not cause traffic to re-enter the roadway to reach another part of the development.

5. Consideration should be given for provision of ring roads and perimeter roads to provide the primary on-site circulation for medium- or large-size commercial offices, industries, regional shopping centers, and mixed-use developments.

## 8.6 Curbs and Posts

1. If, in the opinion of the DOH, there is a high probability that vehicles would utilize a portion of the property frontage other than the approved driveway to gain access to the property, the permit may require that curbing or other physical barriers be constructed.
2. Curbs of the type specified by the DOH in its Standard Details Book may be used to outline driveways and islands within the buffer area. All such curbs shall be outside the limits of the shoulders where the traveled way is not curbed.
3. On uncurbed roadway sections, such curbs shall not be placed in the buffer areas within 3.0 m (10 feet) of the traveled way.
4. Where the traveled way is curbed, the radius returns of the driveway line and grade shall match the curb of the traveled way. Curbs shall not exceed 200 mm (8 inches) in height for 60 kph (40 mph) or less. For higher speeds, use lower curbs.
5. Wood posts are sometimes advantageous as a means of ensuring that vehicles remain on the roadway and do not traverse or park on the buffer area. In some cases, guardrail may be appropriate. Natural barriers, such as trees, may also be sufficient. Barriers used for this purpose must conform with the current edition of AASHTO's Roadside Design Guide.

## 8.7 Drainage

1. All driveways and buffer areas must be constructed so as not to impair drainage within the highway right-of-way, alter the stability of the roadway subgrade, and not impair drainage of the adjacent areas.
2. All culverts, catch basins, drainage channels, pipes, and other drainage structures required, or being changed by the property owner, within the buffer area and/or under the driveway, as the result of the property being developed, must be installed in accordance with the standards of the current edition of the DOH Drainage Manual.

3. If water is allowed to drain from steep approaches onto the roadway pavement, the DOH may require a drop-inlet or slotted drain for the full width of the driveway, depending on the driveway width, grade, and the amount of water (sheet flow) which could flow onto the roadway.
4. Driveway slopes shall be installed as specified in Section 8.4.5.
5. Water shall not be discharged across sidewalks or onto adjacent property.
6. A paved apron equal to one-half the distance between the edge of pavement and the drop inlet or slotted drain shall be provided.

### **8.8 Lighting**

1. The lighting of roadside establishments shall be concentrated on the service area itself. Light beams shall not be directed toward the eyes of approaching drivers on the roadway.
2. All lighting equipment for roadside establishments shall be located off the roadway right-of-way. This includes any overhanging type of appurtenances.

### **8.9 Fencing**

Fencing controls indiscriminate entry or crossing of the roadways by either vehicles or pedestrians. Fencing along right-of-way limits may be required to control access. It shall be located a minimum of 0.3 m (1 foot) outside of the right-of-way line or in the outer separation when frontage roads are present.

### **8.10 Mailboxes**

Mailboxes installed within public right-of-way shall be constructed in conformance with the rules and regulations of the U.S. Postal Service and the guidelines established by the DOH. In the absence of any particular standard, the mailbox installation should conform to the General Principles and Guidelines set forth in the current edition of AASHTO's A Guide for Erecting Mailboxes on Highways. If any conflicts exist between the DOH guidelines and the other-mentioned document, the DOH guidelines will govern.

## 9. MINIMUM STANDARDS FOR EXISTING DRIVEWAYS

Situations occur involving a need or a desire to reconstruct existing driveways. Some examples are:

1. Reconstruction of the adjoining roadway
2. A need or desire by the property owner to improve the driveway approach
3. The type and amount of traffic using the driveway substantially changes
4. A DOH project to correct non-standard and unsafe driveway approaches

When such situations arise, strict application of the regulations prescribed in this manual may work a severe hardship on the property owner. The Commissioner may, in some cases and under appropriate conditions, authorize variances from the above rules and regulations. Such variances will be consistent with the intent of Chapter 17, Article 4, Section 47(2) of the Code. These situations may vary considerably from case to case; therefore, it is not considered feasible to prescribe explicit minimum standards in the form of dimensions, angles, etc. In such cases, driveways may encroach on the corner island (see Figure 11) only when corner radius equals or exceeds 7.5 m (25 feet).

## 10. CONTROL DIMENSIONS

### 10.1 Driveway Width (W)

1. The width of a one-way driveway shall be measured perpendicular to the centerline of the driveway or entrance. The width of a two-way driveway shall be measured parallel to the roadway.
  
2. When a center channelizing island is used in a two-way driveway to restrict entries to right turns in and right turns out, it is appropriate to measure driveway width separately and at right angles between curbing of the channelizing island and driveway curb return. In this type of design, radii and total width of the driveway at the throat shall be greater than for a two-way driveway without a channelizing island. This is due to the need for lateral clearances between face of the barrier curbs.
  
3. Dimensions for driveway width are shown in Table 3.

Table 3. Driveway Width.

<b>DRIVEWAY WIDTH (W)</b>					
meters (feet)					
	<b>One-Way</b>		<b>Two-Way</b>		
<b>Driveway Type</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Minimum</b>	<b>Desirable</b>	<b>Maximum</b>
<b>Residential</b>	3.6 (12)	6.0 (20)	3.6 (12)	6.0 (20)	7.5 (25)
<b>Commercial</b>	4.5 (15)	7.5 (25)	7.5 (25)	9.0 (30)	15.0 (50)
<b>Industrial</b>	4.5 (15)	7.5 (25)	9.0 (30)	10.5 (35)	15.0 (50)

- Note:**
- (a) The desirable values shown in the above table should be used whenever possible. If variation from these values is required because of site conditions, the width and radii selected should be as close as possible to the desired values.
  - (b) The use of both a small width and curb return radius should be avoided. If the width must be reduced, then the curb return radius should be increased and vice versa.

## 10.2 Channelizing Islands

1. A center island, if curbed, usually varies in width from 1.2 m (4 feet) to 3.6 m (12 feet).
2. Whenever a channelizing island is used at the terminus of a right-turn bay or lane, the inside curb return radius shall be a minimum of 22.5 m (75 feet).
3. The smallest curbed island normally considered is one that has an area of approximately 4.6 m<sup>2</sup> (50 square feet) for urban intersections and 7.0 square meters (75 square feet) for rural intersections. However, 9.3 m<sup>2</sup> (100 square feet) is preferable for both.
4. Triangular islands shall be a minimum of 3.6 m (12 feet), and preferably 4.5 m (15 feet), on a side after rounding of corners.
5. Elongated or divisional islands shall be a minimum of 1.2 m (4 feet) wide and 6.0 m (20 feet) long.
6. The curbs of all islands located in the line of traffic flow should be marked in accordance with the current editions of the MUTCD and the DOH Design Guide for Signing.
7. The current edition of the AASHTO design policy presents details for frequently used channelizing islands.

## 10.3 Driveway Angle (Y)

1. One-way and two-way driveways with unrestricted turning movements should intersect the roadway at a 90° angle. If the site conditions (e.g., terrain, lot size and shape) will not permit a 90° approach angle, the angle may be reduced, but not below 70° for commercial and industrial driveways and 60° for residential driveways. The corner radius at acute angles needs to be maximized.
2. Driveways used by vehicles in one direction of travel on the roadway (right turn only) should have minimum angles of 45° for both entry and exit drives.
3. At one-way driveways where only right turns are permitted (e.g., one-way driveway pair on a divided or one-way street), it may be desirable to flatten the approach angle below 90° to increase entry and exit speeds. Under these conditions, the angle of the approach may be reduced but not less than 45°.

## 10.4 Driveway Profile (refer to Figure 9)

### 1. No Highway Edge Curb

#### (a) Cut Section

- (i) Gradient from edge of traveled way to outer edge of shoulder shall be the same as shoulder pitch.
- (ii) The maximum downward gradient from outer edge of shoulder to low point at ditch line or over culvert shall be 8%.
- (iii) The maximum gradient beyond ditch line shall be 8% for commercial driveways and 12% for all others.
- (iv) A minimum 7.5 m (25 feet) landing should be provided.

#### (b) Fill Section

- (i) Slope across shoulder shall be the same as (a) (i) above.
- (ii) The maximum gradient beyond outer edge of shoulder shall be 8% for commercial driveways and 12% for others.
- (iii) A minimum 7.5 m (25 feet) landing should be provided.

### 2. With Highway Edge Curbs and Sidewalks

- (a) The driveway profile should slope upward from the gutter line to the sidewalk as shown in Figure 9. The maximum difference between cross slope of traveled way and the slope of driveway should be 8%. The maximum gradient shall be  $\pm 8\%$  for commercial and industrial driveways and  $\pm 12\%$  for residential driveways.
- (b) Cross slopes on sidewalks shall not exceed 2% (50:1). If it is necessary to "ramp" the sidewalk to meet the driveway elevation, the slope of the ramped portion shall not exceed 8% (12:1).
- (c) Gutters, curbs, or sidewalks, wherever provided, shall be constructed based on Figures 9 and 10. When required, their slopes shall be suitably adjusted to meet the requirements of items (a) and (b) above.



### 3. Vertical Curves

- (a) The vertical curve from the traveled way into the driveway using a curb cut shall be the flattest curve that can be obtained.
- (b) To ensure proper drainage control for any driveway that is not a curb cut, including streets and private driveways using curb returns, the first 6.0 m (20 feet) beyond the closest highway lane, including speed-change lane and/or the distance to the side drain, shall slope away from the roadway at a 2% grade.
- (c) The minimum length of vertical curves shall be 6.0 m (20 feet). In cases when this minimum length is too long for driveway design or the available right-of-way is less than 6.0 m (20 feet), then the designer should utilize multiple grades.
- (d) Vertical curves should be constructed to avoid a hump or dip greater than 150 mm (6 inches) within wheel base length of 3.0 m (10 feet). Crest vertical curves should not exceed 100 mm (4 inches) hump in 3.0 m (10 feet) chord. Sag vertical curves should not exceed 100 mm (4 inches) depression in 3.0 m (10 feet) chord. This will prevent center or overhang drag and allow for load and bounce.

### 4. Side Slopes

The side slopes for driveway embankments within the right-of-way shall not exceed 10% (10:1). See Figure 12.

### 5. Pipe Installation and Maintenance

When a drainage ditch or swale exists, an adequate pipe shall be installed under the driveway based on the requirements of the DOH. All design standards shall be followed with regard to the grade of the driveway after pipe installation.

**Note:** Slopes not exceeding the maximums specified above shall be maintained to a point at least 7.5 m (25 feet) from the outer edge of the traveled way.

## 10.5 Radius of Curvature at Junction of Driveway and Roadway Pavement

The following are maximum and minimum requirements for the driveway radius.

Table 4. Radius of Curvature.

<b>RADIUS OF CURVATURE</b>				
meters <i>(feet)</i>				
Driveway Type	Rural		Urban	
	Minimum	Maximum	Minimum	Maximum
Residential	1.5 <i>(5)</i>	6.0 <i>(20)</i>	1.5 <i>(5)</i>	4.5 <i>(15)</i>
Commercial / Industrial	3.0 <i>(10)</i>	15.0* <i>(50)</i>	3.0 <i>(10)</i>	9.0 <i>(30)</i>

\* Requires special approval from the Traffic Engineering Division of the DOH.

## 10.6 Edge Clearance (E)

1. All portions of the driveway shall be within the frontage boundary line.
2. The edge clearance shall not be less than the radius of curvature (R) for the junction of the driveway and roadway pavement or shoulder edges.
3. The following are the minimum dimensions for edge clearance.

Table 5. Edge Clearance.

EDGE CLEARANCE (E) meters (feet)		
Driveway Type	Urban	Rural
Residential	1.5 (5)	1.5 (5)
Commercial / Industrial	1.5 (5)	3.0 (10)

### 10.7 Corner Clearance (C)

1. In rural areas, a minimum of 9.0 m (30 feet) shall be provided at the near side of intersection in the direction of travel and a minimum of 6.0 m (20 feet) at the far side of intersection in the direction of travel.
2. In urban areas, a minimum of 4.5 m (15 feet) shall be provided at the near and far sides of intersection.
3. If the intersection of a driveway and highway or an arterial street is signalized, the near-side clearance should be two or more times the far-side distance.

### 10.8 Island Clearance from Edge of Traveled Way

1. In uncurbed highway sections, the side of the island next to and parallel to the roadway shall be located at the edge of the shoulder. In no case shall the side be less than 3.0 m (10 feet) nor more than 4.5 m (15 feet) from the edge of the traveled way.
2. Curbs, when used to outline the edge of an island, shall not be placed in the buffer area nor within 3.0 m (10 feet) of the traveled way.

### 10.9 Setback (G)

The minimum required setback from the right-of-way line for gasoline pumps and other fixed equipment of a roadside establishment is 3.6 m (12 feet). Where space is available, up to 4.5 m (15 feet) is required.

### 10.10 Driveway Spacing (D)

The following are the minimum driveway spacing standards along roadways.

Table 6. Driveway Spacing.

Speed Limit kph (mph)	Driveway Spacing meters (feet)
40 (25)	31.5 (105)
50 (30)	37.5 (125)
55 (35)	45.0 (150)
60 (40)	55.5 (185)
70 (45)	69.0 (230)
80 (50)	82.5 (275)
90 (55)	99.0 (330)

These spacings are based on average vehicle acceleration and deceleration rates and are considered necessary to maintain safe traffic operation. Spacing will be measured from the midpoint of each driveway. In the event a particular parcel(s) lacks sufficient roadway frontage to maintain adequate spacing, the land owner(s) shall have the following options:

- (a) They shall seek a variance from the DOH for minimum spacing. In no case shall the variance be greater than the next lowest classification, e.g., a 60 kph (40 mph) roadway requiring a 55.5 m (185 feet) spacing, the distance may not be reduced to less than 45.0 m (150 feet), which is the standard for a 60 kph (35 mph) facility.

- (b) Adjacent land owners may agree to establish a common driveway. In such a case:
  - (i) The driveway midpoint should be the property line between the two parcels;
  - (ii) The driveway must meet standard specifications;
  - (iii) The estimated driveway volume will be the sum of the trip generation rates of both land uses in question; and
  - (iv) A copy of the easement or agreement shall be submitted with the permit. The permit will be issued in the names of both parties.

**Note:** Figures 13 through 16 show typical driveways.

## 11. DRAINAGE

Drainage has long been recognized as an essential part of proper roadway design, construction, and maintenance. Adequate drainage is based on determining where surface runoff will accumulate and/or making provisions for the removal of water as rapidly as necessary. This should preclude damage to private property, undue interference with the operation of vehicles, and excessive maintenance for the DOH.

### 11.1 DOH Drainage Policy

The policy of the DOH is that if increased flows are generated by development, they are the responsibility of the developer. The increase in flow may be handled by in-line or off-line detention or a restructuring of the drainage network. Unless specifically authorized by the permit, the applicant shall not alter the existing drainage patterns or the existing flow of drainage water.

### 11.2 Drainage Considerations for Driveways

All driveways shall be constructed so as not to impair drainage within the right-of-way, direct water onto the roadway, alter the stability of the improved area, or change the drainage of adjacent areas. Where a drainage ditch or swale exists, the applicant shall install adequate pipe (minimum 15 inches) under the driveway in accordance with the permit.

It is important to check the condition of the bottom of the ditch to be sure that the pipe will be set at the proper grade. If the bottom of an unpaved ditch is too high, the ditch must be cleaned. If the ditch bottom is too low, suitable material must be spread to obtain proper grade. The flow line of the installed pipe may be a little lower than the bottom of the ditch. It must never be higher than the ditch bottom. Figures 17 and 18 show approved methods of placing pipe beneath driveways.

### 11.3 Repair / Replacement

The property owner is responsible for repairing or replacing drainage structures which have failed. Should the DOH damage or destroy the drainage structure, it is responsible for restoring in kind or better the entrance and drainage structure.

## 11.4 Stormwater Management Plan

A stormwater management plan will be required when any of the following conditions are anticipated:

- (a) The proposed site development may cause a significant increase in flow or volume of water onto the roadway right-of-way or into DOH drainage facilities. This includes drainage that initially flows away from the roadway but may affect the roadway downstream.
- (b) The proposed site development may cause an increase in flow or volume of water onto another owner's property, either abutting the site development or across the roadway.
- (c) The development is in an area of known drainage or flooding problems.

When it has been determined that a stormwater management plan is required for a proposed site development, it shall be the responsibility of the applicant to ensure the plan is developed in accordance with DOH instructions. Instructions for preparation are contained in the DOH Drainage Manual, Chapter 1. Computations, which must be submitted as part of the plan, shall be made in accordance with the Drainage Manual. The plan shall be prepared under the supervision of a registered professional engineer who possesses a license issued by the WV Board of Registration for Professional Engineers.

## 12. SPEED-CHANGE LANES

A speed-change lane is an auxiliary lane, including tapered areas, used primarily for acceleration or deceleration of vehicles entering or leaving through-traffic lanes. The terms "speed-change lane," "deceleration lane," or "acceleration lane," as used here, apply broadly to the added pavement joining the traveled way of the roadway or street with that of the turning roadway and do not necessarily imply a definite lane of uniform width.

The combination of roadway speed, traffic volume, location, arrangement of driveways and intersections, and safety may require the installation of an acceleration or deceleration lane, or both, to serve a proposed or existing driveway. When required, the speed-change lane shall be of sufficient length and width to allow vehicles to safely enter or leave the property.

### 12.1 Criteria for Speed-Change Lanes

A left-turn deceleration lane should be provided on roadways where traffic volumes are high enough or safety considerations are sufficient to warrant them. Table IX-15 in the 1994 edition of the AASHTO design policy is a guide to traffic volumes where left-turn facilities should be considered.

### 12.2 General Guidelines

The following are the general guidelines pertaining to speed-change lanes:

1. Auxiliary or speed-change lanes shall be provided based on the minimum requirements set forth in Section 12.1.
2. An auxiliary lane may be required even though the regulations mentioned in Section 12.1 are not met where safety considerations, such as sight distance, dictate.
3. Auxiliary lanes when required shall be constructed at no cost to the DOH.
4. When the width of the existing highway right-of-way is insufficient to permit the construction of a needed auxiliary lane, the applicant shall at no cost to the WVDOH provide all necessary additional rights-of-way.
5. When two accesses have speed-change lanes that overlap, or are in close proximity, a continuous lane shall be established between the accesses to improve roadway consistency and safety, and to maintain edge continuity.
6. If the location of the access driveway(s) is within two different speed zones, the criteria for the higher speed zone shall apply.



7. A speed-change lane shall be at least 3.0 m (10 feet) wide or equal in width to that of the through lane, whichever is greater.
8. When no curb and gutter are required, a paved shoulder shall be provided that matches the existing shoulder width along the roadway or is a minimum of 0.6 m (2 feet) in width, whichever is greater.
9. When curbing is used adjacent to the auxiliary lane, an appropriate curb offset shall be provided.

### **12.3 Length of Speed-Change Lanes**

The length of a speed-change lane should be determined using the equation  $[ 2 \times (25 \text{ feet per vehicle}) \times (\text{peak-hour volume}) ] / [30 \text{ cycles per hour}]$  or by software methods as agreed upon in discussions with DOH Traffic Engineering Division.

### 13. INTERNAL CIRCULATION

In order to ensure efficient internal circulation, storage areas at access drives must be designed to have adequate capacity. Storage on a driveway should be of sufficient length to keep stopped vehicles from blocking the path of entering vehicles or vehicles traveling along the internal circulating roadways.

The following guidelines provide efficient internal circulation in medium- and large-size developments:

#### 1. Site Layout

Where large commercial developments (greater than 46,000 m<sup>2</sup> [500,000 square feet] of building area) are involved, one of the two following basic site layouts should be used to design good access and site-circulation:

- (a) Locate the building at least 150.0 m (500 feet) from the roadway. This will provide a throat length of 75.0 m (250 feet), which is necessary for a high-capacity access driveway and adequate parking-bay lengths between the ring road and the building face.
- (b) Orient the long dimension of linear developments parallel to the roadway. This will provide for long signal spacing and good on-site circulation.

#### 2. Internal Storage

To determine the correct length of storage, traffic volumes should be assigned to the applicable lanes and the highest volume should be accommodated. The following are accepted values:

- a) For major regional centers, double left turns and a 75.0 m (250 feet) throat length for vehicle storage should be provided.
- b) For smaller community centers, a minimum of 36.0 m (120 feet) to 45.0 m (150 feet) of storage space should be provided.
- c) To avoid traffic backup onto the roadway, traffic control should be designed so that traffic entering the site from the roadway has the right-of-way.

## 14. MAINTENANCE

Driveways or entrances become unserviceable due to heavy equipment damage, reclamation by natural causes, increased traffic volume, and other related factors. They should be well-maintained to ensure that the original profile is retained, that operating speeds are not reduced by rough surfaces, and that no damage to or deterioration of the roadway pavement is caused by the condition of the driveway.

The DOH places the responsibility on the property owner to maintain driveways and adjacent areas within the state highway right-of-way. Maintenance shall be done in a manner satisfactory to the DOH. The DOH assumes no obligation, financial or otherwise, for maintenance of driveways or entrances.

To ensure the safety of motorists and pedestrians and to promote effective drainage, the following guidelines shall be followed by the property owner with regard to the maintenance of driveways.

### 1. Within Right-of-Way Limits

#### (a) Entrances in curb and gutter sections

If the DOH is responsible for maintenance of adjacent sidewalks, it shall maintain the entrance to the back edge of the sidewalk. If there is no sidewalk, or if the DOH is not responsible for the maintenance of the sidewalk, it shall maintain the entrance only to a line 0.6 m (2 feet) behind the gutter line. The property owner is responsible for the satisfactory maintenance of the remainder of the entrance.

#### (b) Entrances not in curb and gutter sections

The DOH shall maintain that portion of the entrance between the edge of the pavement and normal shoulder line. The property owner shall be responsible for the satisfactory maintenance of the remainder of the entrance with the following exceptions:

- (i) When the DOH constructs a separation island as part of a road project or safety improvement, it is responsible for the maintenance of the island unless the right-of-way agreement designates the responsibility as that of the landowner.

- (ii) When the entrances are constructed under permit, the maintenance of the separation island shall be the responsibility of the property owner.

## **2. Drainage**

Maintenance activities pertaining to drainage within the owner's property shall be the owner's responsibility. This includes leakages in pipe-joints, blockages in inlets, grates, curb openings or combination inlets due to trash accumulation and erosion control.

## **3. Snow Removal**

It is the responsibility of the property owner to remove or clear snow, sleet, and ice, or to open windrows of such materials upon any portion of the driveway or entrance along the state roadway. Snow and ice from the driveway shall not be moved onto the traveled surface or shoulder of the roadway.

## 15. TRAFFIC ACCESS AND IMPACT STUDY

A site traffic access and impact study is a tool used to obtain information needed to assess the effects a particular development will have on the surrounding transportation network. It will determine what provisions are needed for safe and efficient site access and traffic flow. It will also address other related issues.

Driveway permit applicants for major developments that have a significant impact on the roadway system shall submit a traffic impact study report which determines the type of access and scope of required roadway improvements required to accommodate the proposed development. The study and the report shall be prepared by and under the supervision of a registered Professional Engineer specializing in traffic engineering studies. This work must be done in cooperation and coordination with personnel of the Traffic Engineering Division of the DOH.

### 15.1 Warrants for Traffic Impact Study

The following situations are thresholds that commonly trigger the requirement for a traffic impact study:

1. When the development will generate the following specified number of vehicular trips:
  - (a) The proposed development is expected to generate 3,000 or more vehicle trips per day (total inbound and outbound development traffic).
  - (b) The total adjoining roadway plus development traffic will exceed 500 vehicles per hour during the adjoining roadway's peak hour and 100 or more of these vehicles are newly generated peak direction trips to or from the site.
2. When the development contains more than 100 dwelling units or commercial property with more than 150,000 square feet of gross leasable area.
3. At the discretion of personnel from the Traffic Engineering Division of the DOH.

### 15.2 References

Traffic engineering techniques/methodologies described in the following references should be used as guides for performing the traffic impact study:

1. American Association of State Highway and Transportation Officials, A Policy on Geometric Design of Highways and Streets. Washington, DC, current edition.

2. Federal Highway Administration, Manual on Uniform Traffic Control Devices, U.S. Department of Transportation, Washington, DC, current edition.
3. Highway Capacity Manual, Transportation Research Board Special Report 209, National Research Council, Washington, DC, current edition.
4. Institute of Transportation Engineers, Traffic Access and Impact Studies for Site Development - A Recommended Practice, Washington, DC, 1992.
5. Institute of Transportation Engineers, Trip Generation, current edition.
6. Stover, Vergil G. and Koepke, Frank J., Transportation and Land Development, Institute of Transportation Engineers, Washington, DC, 1987.
7. Neumann, E S. and Deshpande, G K., West Virginia Special Traffic Generators Study, Phase I. Department of Civil Engineering, West Virginia University, Morgantown, WV, August 1974.

### **15.3 Final Report**

A final report must be prepared to document the results of the traffic impact study and the recommended improvements to accommodate the projected traffic due to the proposed development. Specific contents of the report should be discussed in a scope of work meeting between the study preparer and the DOH traffic engineer. The report must be presented in a format which can be understood by both technical and non-technical parties. The presentation of data and analysis results should be accomplished on either schematic diagrams of the study area or through the use of charts and/or tables. All sources of data and methodologies which were used in the study must be properly referenced and documented. The report should be prepared in accordance with the previously cited ITE Recommended Practice. Appendix C identifies the contents of a traffic impact study report.

### **15.4 Review Procedure**

The final report shall be submitted to the DOH for review and approval. Reports which do not contain the required information or indicate that the study was not done in accordance with DOH requirements will be returned for correction and resubmission.

## 15.5 Developer's Participation in Project Costs

The following guidelines have been developed in an effort to obtain an equitable method of determining developer responsibility for participation in funding traffic signal work and traffic control devices necessitated by land development.

1. Where the proposed development will generate sufficient traffic to warrant signalization, the total cost for materials and installation shall be borne by the developer.
2. Where an existing traffic signal must be modified to accommodate traffic movements to or from the development, the developer shall bear the total cost for any materials, installation, and relocation required to accommodate the development traffic.
3. If the development traffic causes the level of service of the facility to worsen, the developer will be required to fund the roadway improvements needed.
4. The developer shall, at his/her own expense, install and maintain as specified in the permit, all non-electrically-powered traffic control devices on their approach, which are required to provide for the safe and orderly movement of vehicular and/or pedestrian traffic. These devices shall include, but not be limited to, any required regulatory, warning or guide signs, delineators, and pavement markings.

**Note:** The maintenance and utility costs of the traffic signal(s) shall be the responsibility of the DOH or municipality. An operating agreement is required prior to installation of a traffic signal.



**APPENDIX A**

**ADMINISTRATIVE REGULATIONS**





This appendix will contain what is currently designated as " XIII. Appendix " in the current version of the Driveway Manual.



**APPENDIX B**

**LIST OF DISTRICT OFFICES**



District	Street Address	Mailing Address	Phone
1	1334 Smith Street Charleston, WV 25305	1334 Smith Street Charleston, WV 25305	(304) 558-3001
2	801 Madison Avenue	P. O. Box 880 Huntington, WV 25712	(304) 528-5625
3	720 Depot Street	P. O. Box 308 Parkersburg, WV 26102	(304) 420-4645
4	Exit 121, I-79 Meadowbrook Road (Bridgeport)	P. O. Box 1871 Clarksburg, WV 26301	(304) 842-1500
5	U. S. Rt. 50	P. O. Box 99 Burlington, WV 26710	(304) 289-3521
6	904 Third Street Moundsville, WV 26041	904 Third Street Moundsville, WV 26041	(304) 843-4008
7	Depot Street	Drawer 1228 Weston, WV 26452	(304) 269-0414
8	U. S. Rt. 219 North Parsons Road	P. O. Box 1516 Elkins, WV 26241	(304) 637-0220
9	210 Maple Street Ronceverte, WV 24970	210 Maple Street Ronceverte, WV 24970	(304) 647-7450
10	120 Scott Street Princeton, WV 24740	120 Scott Street Princeton, WV 24740	(304) 425-2155

**Note:** Refer to the enclosed state of West Virginia map to identify various counties in each district.



**APPENDIX C**

**CONTENTS OF TRAFFIC IMPACT STUDY REPORT**



## I. Introduction

- A. Letter of transmission identifying who did the report and for whom
- B. Description of study area and proposed land use including building floor space.
- C. Location of proposed access points
- D. Identification of peak hours and day of peak hours

## II. Basic Traffic Conditions

- A. Description of road network and intersections in vicinity of site and specifically at the access points
- B. Traffic counts during peak-impact hours
- C. Gap or queue length studies, if appropriate

## III. Traffic Analysis

- A. Site Access
- B. Capacity and Level of Service
- C. Traffic Safety
- D. Traffic Signals
- E. Site Circulation and Parking

## IV. Site Traffic Generation

- A. Trip generation rates used and their source
- B. Traffic generated during peak-impact hours (West Virginia trip generation rates for certain land uses are available from the Neumann and Deshpande report and through the Traffic Engineering Division of the DOH)

## V. Site Traffic Distribution

- A. Method used
- B. Tables or figures showing estimated site traffic movements by direction
- C. Discussion of method used for traffic assignment and assumptions used for assignment of traffic to network

## VI. Non-Site Traffic Projections

- A. Definition of design year (opening of proposed development)
- B. Identification of individual developments in study area whose traffic is to be included in impact calculations

- C. Adjustments of off-site through traffic volumes, if needed, using agreed upon growth rate
- D. Assembling of off-site traffic forecast for design year, if needed

#### VII. Traffic Assignments

- A. Assignments of peak-period traffic to intersections and access points
- B. Figures for existing peak impact hours traffic, site traffic, and total traffic
- C. Recommended access design and improvements

#### VIII. Review of Site Plan

- A. Internal reservoir at access points
- B. Parking layout
- C. Loading dock locations and access, including design truck used
- D. Recommended changes

#### IX. Improvement Analysis

- A. Improvements to accommodate base traffic
- B. Additional improvements to accommodate site traffic
- C. Alternative improvements
- D. Status of improvements already funded, programmed, or planned
- E. Evaluation

#### X. Findings

- A. Site accessibility
- B. Traffic impacts
- C. Need for improvements
- D. Compliance with applicable local codes

#### XI. Recommendations

- A. Site access / circulation plan
- B. Roadway improvements
  - 1. on-site
  - 2. off-site
  - 3. phasing, if appropriate

### C. Transportation System Management Actions

1. off-site
2. on-site operational
3. on-site

### D. Other

## XII. Conclusions

**Note:** Not all analysis described in the final report guidelines will be required for each study. Applicable analyses should be determined in a scope of work meeting between the study preparer and the DOH traffic engineer. Only those analyses needed to address the issues relevant to the proposed development, its site and vicinity, and current and anticipated traffic conditions will be required.

