

INDIANA DEPARTMENT OF TRANSPORTATION

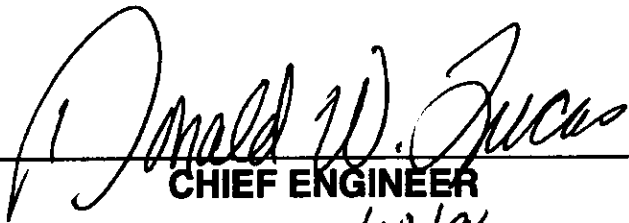


DRIVEWAY PERMIT MANUAL 1996 VERSION

INDIANA DEPARTMENT OF TRANSPORTATION

**DRIVEWAY PERMIT MANUAL
1996**

APPROVED

A handwritten signature in black ink, reading "Donald W. Lucas", is written over a horizontal line. The signature is cursive and flows from left to right.

CHIEF ENGINEER

DATE: 10/18/96

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PREFACE

One of the primary purposes of this Handbook is to promote driveway uniformity throughout the State of Indiana. The geometric and guidelines suggested in this manual and their applications are to be used in conjunction with field investigation and engineering judgement; however, these guidelines are not a substitute for the exercise of reasonable care on the part of the highway user. This manual shall not be construed as an instrument to mandate the use of any procedures at a particular location. It is not intended to specify as a legal requirement any maximum or minimum standards as to size, number or location of driveways.

Any reference to requirements or standards are considered to be discretionary on the part of the investigator. Any reference to distances or measurements or locations as referenced herein shall be construed to be typical in nature and shall be used only as a guide for field applications.

Driveway geometric, materials and specifications were current at the time of this publication but should be checked for revisions and changes that may have occurred.

The present edition is a general guide and the applicant should be aware that the Indiana Department of Transportation (INDOT) reviews each driveway on an individual basis.

FOREWORD

This publication is presented for the purpose of explaining the access permit rules for permits for access to state highways. It also includes the legal basis for the exercise of this authority and explains the procedures to be followed when applying for a driveway permit.

The purpose of access control is to protect the mainline through-traffic from indiscriminate conflicting movements along the roadside. This control becomes more and more important since traffic is increasing with each succeeding year.

The policies, standards, and procedures stated herein have been established to achieve traffic safety on state and federal highways throughout the state. Other governmental units may wish to use this material as a guideline.

Because of the infinite possibilities of needs for different designs and future safety standard revisions, these standards cannot be expected to cover every type of field condition encountered. In some cases it will, therefore, be advantageous to all concerned if consultations are held with the Permit Section of the Indiana Department of Transportation before any commitments are made.

Application forms for driveway permits may be obtained from any INDOT District or Sub-District Office.

GENERAL

Regulation and control of driveway connections are necessary to provide efficient and safe operation on the highways and to utilize the full potential of the highway investment. Landowners adjacent to highway have certain rights of access consistent with their needs. Road users have certain rights to freedom of movement, safety, and efficient expenditure of their public highway funds. It falls on the Indiana Department of Transportation to regulate and control the location, design, and operation of access driveways and to reconcile, to the extent feasible, the needs and rights of both.

Any traffic movement between the roadway and adjacent private property must be made, at least in part, across a portion of the right-of-way obtained and retained exclusively for highway purposes. Since the Indiana Department of Transportation has the right and responsibility to utilize the whole of the right-of-way to the best advantage for highway purposes, it is proper that some control be exercised over the number, location, and the general design features of driveways. Controlling the driveway connections limits the length along the traveled way used for ingress and egress and avoids or eliminates long open stretches outside the traveled way along which drivers can indiscriminately operate between the traveled way and the roadside developments. This enables vehicles to travel with reasonable freedom between such roadside developments.

Control values require minimum dimensions in some instances, ranges of dimensions in other cases, and maximum values for still other situations. Driveway design in accordance with these parameters should assure a reasonably good level of service to the driveway users and at the same time minimize the interference to highway traffic.

The Indiana Department of Transportation is authorized to determine and establish such requirements and restrictions for driveway approaches as may be necessary to provide for the drainage of the highway, preservation of the highway and the safety and convenience of traffic on the highway. A written permit application shall be considered by the Department and, if in accordance with properly established regulations and requirements, a permit may be granted subject to appropriate conditions and provisions contained therein. All work on the permit shall be performed to the satisfaction of the Department.

PUBLIC ROADS

For driveway approaches to residential subdivisions, industrial parks, commercial shopping malls, and similar developments where dedication as a public road right-of-way is to be made, the design should conform to American Association of State Highway and Transportation Officials' (AASHTO) "A Policy on Geometric Design of Highways and Streets" (more commonly known as the Green Book). INDOT standard sheets 610 for public road approaches should also be reviewed for design requirement applicability.

SECTION 1 : DEFINITION OF TERMS

In the interpretation of these regulations, the word "shall" is to be interpreted as being mandatory. The work "should", "desirable", or words of similar import are to be interpreted as being the recommendations of the Indiana Department of Transportation and, where the content so indicates, as denoting a factor or principle to be considered by the applicant in determining the location or construction of a driveway on a state highway right-of-way before a permit is issued.

In as much as the shoulders of all highways will not be surfaced, driveways, for the purpose of said definitions, are constructed to extend to the outside edge of the traveled way of any highway.

Acceleration Lane: A speed change lane, including taper, for the purpose of enabling a vehicle entering a roadway to increase its speed to a rate at which it can safely merge with through traffic.

Access: A location which allows vehicular and/or pedestrian traffic to cross the highway right-of-way line and is positioned at the connection of a driveway with the approach at the right-of-way line.

Access, Control of: The condition where vehicular traffic movement from abutting property to the highway is fully or partially controlled.

Applicant: A person, partnership, company, corporation, association, or agency making application for a permit to perform work on an approach.

Application: A formally prepared request for a permit which is presented by an applicant on a permit form to the department seeking permission to perform work on highway right-of-way.

Approach: A way or place improved for vehicular or pedestrian traffic on the highway right-of-way which joins the pavement edge of the highway with a driveway or pedestrian walkway.

Auxiliary Lane: A portion of the roadway adjoining the traveled way for parking, speed change, turning, storage for turning, weaving, truck climbing or for other purposes.

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

Average Daily Traffic (ADT): The total traffic volume during a given time period (in whole days), greater than one day and less than one year, divided by number of days in that time period.

Buffer Area (Border Area): The area between the outside edge of shoulder or curb and the right-of-way line.

Channelizing Island: An area within the roadway not for the vehicular movement; designed to control and direct specific movements of traffic to definite channels. The islands may be defined by paint, raised bars, curbs, or other devices.

Commercial Approach: An approach, which joins the highway with a driveway to private property used for commercial purposes and to public property.

Conflict: A traffic event that causes evasive action by a driver to avoid collision with another vehicle, usually designated by a traffic signal application or evasive lane change.

Conflict Point (Conflict Area): An area where intersecting traffic either merges, diverges, or crosses.

Crossover: A paved or graded crossing in the highway median which allows vehicles to cross or to turn across the highway.

Deceleration Lane: A speed-change lane, including taper, for the purpose of enabling a vehicle to leave the through traffic lane at a speed equal to or slightly less than the speed of traffic in the through lane and to decelerate to a stop or to execute a slow speed turn.

Department: The Indiana Department of Transportation acting directly or through its duly authorized officers and agents.

Design Hour Volume (DHV): The traffic volume for the design hour in the peak direction of flow, usually a forecast of the relevant peak hour volume, in vehicles per hour (VPH).

Driveway: A way or place not on the department right-of-way which is used for vehicles.

Driveway Angle: The angle between the highway centerline and the driveway centerline measured in a clockwise direction.

Driveway Approach Width: The maximum length parallel to the highway that can be used practically by a vehicle to perform a circular maneuver that is tangent to paths that are parallel to the highway before turning and parallel to the driveway after turning.

Driveway Flare: A triangular pavement surface that transitions the driveway and the highway pavement for facilitating turning movements.

Driveway Return Radius: A circular pavement transition between the driveway and the highway for facilitating turning movements.

Driveway Width: The narrowest width of driveway measured perpendicular to the centerline of driveway.

Egress: The exit of vehicular traffic from abutting properties to the highway.

Expiration Date: The last calendar day that the valid permit is in effect and that the approach must be in compliance with all conditions of the permit.

Field Approach: An approach which joins the highway with a driveway to private property that is vacant, in an unimproved condition, or a farm field.

Frontage Width: The distance along the highway right-of-way line in front of an abutting property.

Gradient (Grade): The rate or percentage of change in slope either ascending or descending, from or along the highway. It is to be measured along the centerline of the roadway or access.

Highway: A roadway under the jurisdiction of the department that is designated as a state route, a US route, or an interstate route.

Ingress: The entrance of vehicular traffic to the abutting properties from a highway.

Interchange: A facility that grade separates intersecting roadways and provides directional ramps for access movements between roadways. The structure and the ramps are considered part of the interchange.

Issue Date: A calendar day that the permit is granted to the applicant.

Level Of Service: A Qualitative measure of the effect of a number of factors including speed and travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience, and operating costs.

Limited Access Facility: A highway especially designed for through traffic and over, from, or to which owners or occupants of abutting land or other persons have no right or easement or only a limited right or easement of direct access, light, air, or view by reason of fact that their property abuts such limited access facility or for any other reason.

Median: The portion of a divided highway separating the traveled way for traffic proceeding in opposite directions.

Notice: A certified letter from the department addressed to the owner(s) of the real estate stating that the approach(es) for a driveway(s) emanating from the real estate is unauthorized and providing the approximate location of the approach(es), a statement of any substandard elements of the approach(es), the action to be taken by the owner and the deadline for completing the prescribed action.

Permit: A legal document in which the department gives written permission to an applicant following the issuance of a permit by the department.

Permittee: The applicant following the issuance of a permit by the department.

Private Approach: An approach which joins the highway with a driveway to private property having a residence, barn, private garage or other improvements and is ordinarily used only by the owner or occupant of the premises, guests and necessary service vehicles.

Purchased Limited Access: Right-of-way along any highway designated by the department to be a limited access facility and whose access rights have been acquired by the department.

Right-of-Way: All land under the jurisdiction of and whose use is controlled by the department.

Shoulder: That portion of the highway right-of-way contiguous with the traveled way for accommodation of stopped vehicles, for emergency use, and for lateral support of roadway base and surface courses. It is measured from the edge of pavement for traveled way or, if present, auxiliary lane to the intersection of the shoulder and fill or ditch slopes.

Sight Distance: The distance visible to the driver of a passenger vehicle measured along the normal travel path of a roadway to a specified height above the roadway when the view is unobstructed to traffic.

Storage Length: Additional lane footage added to a deceleration lane to store the maximum number of vehicles likely to accumulate during a peak period so as not to interfere with the through travel lanes.

Title Evidence: Documentation in the form of a certified search covering a period of twenty (20) years, current title insurance or certified letter from abstractor or title insurance agent certifying fee simple ownership of property.

Traffic: Pedestrians, ridden or herded animals, vehicles, and other conveyances either singly or together while using any highway for purposes of travel.

Traffic Control: Devices such as signs, barricades, pavement markings and signalization used to direct traffic in safe orderly use of the highway.

Traveled Way: The portion of roadway used for the movement of traffic, excluding shoulders and auxiliary lanes.

Turning Radius: The radius of an arc which approximates the turning path of a vehicle.

Unauthorized Approach: An approach which has been constructed, reconstructed, altered or modified; which remains incomplete, or has become substandard for any reason, such as change in land use; that is not approved nor authorized to exist in its present condition by the department.

Weaving Maneuvers: The crossing of traffic streams moving in the same general direction accomplished by merging and diverging.

SECTION 2 : APPLICATION

Any person, partnership, company, corporation, association, or agency intending to construct an access on State's right-of-way shall make written application to, and secure a permit from, the appropriate District or Department office in the District where the driveway is to be constructed. This permit must be obtained before commencing construction on a driveway within the right-of-way of a state highway.

APPLICATION REQUIREMENT: A new driveway permit application shall be required when a relocation, alteration or remodeling of an access, approach and/or crossover, or any change in the character of the use of the access approach and/or crossover is proposed. The granting or denial of such application shall be governed by the same regulations and judged by the same standards as an application for a permit for a wholly new access, approach, and/or crossover.

APPLICATION PREPARATION: Application to the department shall be made on the form as prescribed by the department. The form and accompanying documentation shall be submitted containing as many copies as may be prescribed by the Department. The result shall be a permit application package that completely and clearly describes and records the proposed work to be performed on the department's right-of-way by the applicant. It contains plans, documents, and other information on which to base a determination. It must also provide a clear record that can be reviewed in future years for investigative purposes.

The application shall include immediately proposed and future work affecting all locations of access to the applicants property and adjacent parcels in which an interest is held by the applicant.

PERMIT FORMS AND DOCUMENTS: The following forms and instructions for completing them out can be obtained from the District or Subdistrict offices. Complete and accurate information is essential to expedite the permit processing.

1. Driveway Permit Form: A document that initially is considered the application for a driveway permit and becomes the permit upon approval of the proposed driveway approach work. It contains basic information on the front of the form needed to locate and record the permit work, and lists standard general provisions on the back. The form should be signed by the owner of the fee simple title.

2. Additional Disclosure Form: A document used to record persons, organizations, companies, agencies, or anyone considered an interest holder in a parcel of property to be served by a driveway approach submitted as a driveway permit application. This form allows an interest holders to be identified and a separate form shall be used for each interest holder. This document shall be notarized.

3. Permit Bond: A document used to guarantee that work performed on the

right-of-way by the applicant (principal) will be completed as required by conditions and provisions of the permit. The bonding company (surety) is bound by the bond to see that the permit is completed satisfactorily should the permittee (principal) fail to perform properly. The bond shall cover the work to be performed in the right-of-way however the minimum bond shall be \$5,000.00. This document shall be notarized.

4. Traffic Impact Study: A study used to evaluate the impact of present and future traffic generated by the proposed development on the adjacent roadway network. This study shall be prepared by a registered professional engineer.

The District Permit Section shall see that the applicant is put in direct contact with appropriate personnel, and arrangement shall be made convenient to the applicant within normal limitations, such as working hours and current work load of the permit staff. It is preferred that a meeting at the work site be arranged so that the applicant and permit inspector to discuss the field conditions and needs of the applicant. Any unique circumstances shall be discussed in detail and the applicant shall be given guidance on a proper course of action. The permit inspector, who does not have approval authority, shall provide the applicant with the following:

1. Required forms
2. Permit Manual
3. Verbal instructions
4. How to obtain more information
5. Where to submit permit application package

The initial meeting(s) between the applicant and the district office representative is not considered to be one of the three allowable inspections and there is no limit on the number of these meetings. The application may also be subject to technical review by other district sections, such as Traffic, with additional modifications possibly being required. Under certain circumstances, such as crossing limited access right-of-way, nonstandard geometric, or large-scale site development, the application will be forwarded to the Central Office for final decision. All problems must be solved before the permit is issued and the department shall be satisfied that the applicant's work on the highway right-of-way will be successful.

The map contained on page 13 displays the location of the district offices and approximate boundaries of each.

APPLICATION RECEPTION: An applicant must contact an office of the Department in order to obtain a permit. Initial contact between the applicant and the Department may be made by telephone, through the mail, or over the counter at a Department office. It shall first be determined where the work on the right-of-way is to be performed and the applicant shall be given the telephone number and/or street address of the appropriate District and, specifically, the District Permit Section. The following telephone numbers, locations, and working hours shall be used in referring the applicant to the District:

1. Crawfordsville District

Telephone Number (317) 362-3700
Fax Number (317) 364-9226
Location 110 W. South Boulevard
(Jct. SR47 and Grant Avenue)
Hours 8:15 A.M. to 4:45 P.M.

2. Fort Wayne District

Telephone Number (219) 484-9541
Fax Number (219) 471-1039
Location 5333 Hatfield Road
(Jct I69 and US30)
Hours 8:15 A.M. to 4:45 P.M.

3. Greenfield District

Telephone Number (317) 462-7751
Fax Number (317) 462-7751
Location 32 S. Broadway
(1/2 block South of US40 on Broadway)
Hours 8:15 A.M. to 4:45 P.M.

4. Laporte District

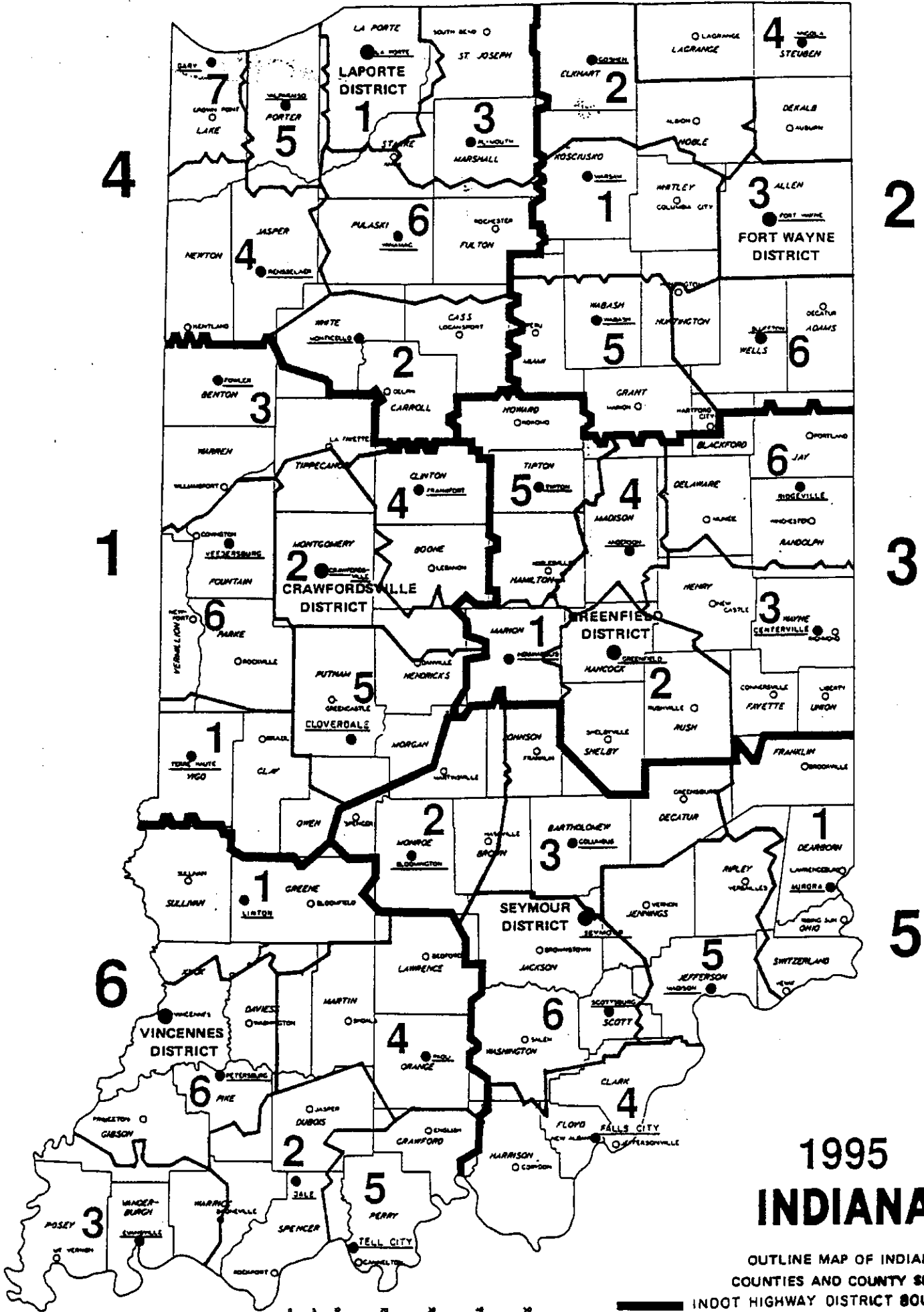
Telephone Number (219) 362-6125
Fax Number (219) 325-3937
Location 302 Philadelphia Street
(2 blocks South of SR2 on Philadelphia & daytona)
Hours 7:15 A.M. to 3:45 P.M.

5. Seymour District

Telephone Number (812) 522-5649
Fax Number (812) 522-7658
Location 813 E. Tipton Street
(On eastern city limits on US 50)
Hours 8:15 A.M. to 4:45 P.M.

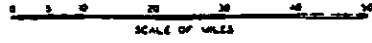
6. Vincennes District

Telephone Number (812) 882-8330
Fax Number (812) 882-2752
Location 2526 N. 6th Street
(Old US41 NE City Limits)
Hours 8:15 A.M. to 4:45 P.M.



1995 INDIANA

OUTLINE MAP OF INDIANA
 COUNTIES AND COUNTY SEATS
 INDOT HIGHWAY DISTRICT BOUNDARIES
 SUB DISTRICT BOUNDARIES



SECTION 3 : TYPES OF DRIVEWAY PERMITS

Driveway permits have been separated into four types, which are Commercial Major, Commercial Minor, Commercial Sub-minor, and Private to reference the driveway permit application to appropriate policies, procedures and standards. Each type is defined and discussed in detail as follows.

1. COMMERCIAL MAJOR DRIVEWAY PERMIT: This type of approach connects the highway to the **private property used for commercial purposes or to a public property, which attracts enough traffic to require auxiliary lane(s)**, as determined by INDOT. The location for this type can be in either an urban or rural area. It can also be designated as either a class III or IV driveway approach (see section 4 for approach class description).

2. COMMERCIAL MINOR DRIVEWAY PERMIT: This type of approach connects the highway to **private property used for commercial purposes, or to a public property, and which does not attract sufficient traffic to warrant an auxiliary lane(s)**, as determined by INDOT. The location for this type can be in either an urban or a rural area. It can also be designated as either a class III or IV driveway approach (See Section 4 for approach class descriptions).

3. COMMERCIAL SUB-MINOR DRIVEWAY PERMIT: This type of approach connects the highway to **private property used for commercial purposes, and which does not attract more than 25 vehicles per day**, as determined by INDOT. The location of this type can be in either an urban or rural area. It can also be designated as either a Class I, or II driveway approach (See Section 4 for approach class descriptions).

4. PRIVATE DRIVEWAY PERMIT: This type access connects the highway to private property having a residence, barn, or private garage, in improved or unimproved condition, used by the owner or occupant of the premises, guests, and necessary service vehicles. The location for this type of driveway can be in either an urban or a rural area. It can also be designated either as a Class I, II, or V driveway approach (See Section 4 for approach class descriptions).

SECTION 4 : TYPES OF APPROACH CLASSES

Approaches are designated as belonging to one of the following seven classes.

APPROACH CLASS	TYPE OF APPROACH	INDOT STANDARD RAWING
CLASS I	Private Approach	610-DRIV-01 610-DRIV-02 610-DRIV-03
CLASS II	Private Approach	610-DRIV-04 610-DRIV-05 610-DRIV-07
CLASS III	Commercial Approach	610-DRIV-08
Class IV	Commercial Approach	610-DRIV-07 610-DRIV-09 610-DRIV-10
Class V	Field Approach	610-DRIV-07 610-DRIV-11
Class VI	Heavy Industrial/Truck Stop Approach	610-DRIV-12 610-DRIV-13 610-DRIV-14
Class VII	Heavy Industrial/Truck Stop Approach	610-DRIV-14 610-DRIV-15 610-DRIV-16

1. Class I: The location for this class of approach is usually in an urban area. The approach characteristics are such that it cuts through an existing curb and serves a private residence and improved property. A hard pavement surface, curbs, and sidewalks are common elements in the construction of these approaches.

2. Class II: The location for this class of approach is usually in a rural area. The approach characteristics are such that it is attached to the highway edge of the pavement or improved hard surface shoulder and serves private residences and improved property. A pipe continuing drainage along the highway ditch line is a common element in the construction of these approaches.

3. Class III: The location for this class of approach is usually in an urban area. The approach characteristics are such that it cuts through an existing curb and services a commercial establishment. A hard pavement surface, curbs, drainage structures,

auxiliary lanes, tapers, and sidewalks are common elements in the construction of these approaches.

4. Class IV: The location for this class of approach is usually in a rural area. The approach characteristics are such that it is attached to the highway edge of pavement and serves a commercial establishment. A hard pavement surface, auxiliary lanes, tapers, and a pipe continuing drainage along the highway ditch line are common elements in the construction of these approaches.

Approach edges for Class IV Commercial Minor Driveway Approaches shall be connected to either tapers of a short auxiliary lane or to the highway traveled way pavement with returns of adequate radii.

Tapers which improve the ingress and egress turning movement characteristics of the approach and which connect the radii, returns to the highway traveled way pavements are required when either of the following criteria are met: Highway ADT is greater than 4000 vehicles per day, or approach ADT is greater 40 vehicles per day. Tapers will not be required for those commercial drives whose conditions will not exceed these criteria. In these instances, approach edges may be connected to the highway traveled way with returns of radii only.

5. Class V: The location for this class of approach is either in an urban or rural area. The main characteristics are that it serves a vacant lot, field, or unimproved property and draws only an occasional vehicle. It can be serving private property used for either residential or commercial purposes or it can serve public property. A graded surface and a pipe continuing drainage along the highway ditch line are common elements in the construction of these approaches.

6. Class VI: The location of this class of approach can be either in rural or urban area. These drives serve heavy industrial property and truck stops.

7. Class VII: The location of this class of approach can be either in rural or urban area. These drives serve heavy industrial property and truck stops.

SECTION 5 : NUMBER OF DRIVEWAYS

Regulating the maximum number of driveways per property frontage limits the number of conflict areas and provides turning drivers more time and distance to execute their maneuvers. Number of driveways should be a minimum to adequately serve the needs of the abutting property.

Commercial developments located on the corner of a state arterial and a state collector should be restricted to access on the collector only. Access should be limited to a single drive per property unless frontage exceeds 120 m (400 feet). When more than one driveway per frontage is necessary to facilitate operations; site conditions, current traffic pattern and engineering judgement should be used to make a decision. A property, which has more than one frontage on a highway may be allowed one driveway per frontage.

Where there are several adjacent roadside establishments, each with limited frontage or where there is a probability of such development, consideration shall be given to constructing a frontage road for several driveways so as to reduce the number of separate connections to the highway. Frontage roads that parallel the highway shall be allowed access points at minimum intervals of 150 m (500 feet). Frontage roads should be set back from the state highway in such a manner as to allow adequate storage for entering and exiting traffic.

SECTION 6 : JOINT DRIVEWAYS

An approach to a driveway that serves adjacent property owners may be allowed. However, the application shall be jointly prepared and submitted by the property owners. One property owner should assume the role of applicant on the application form, SF 1945R, and the other(s) shall sign the Additional Disclosure Sheet, SF 23237.

It is recommended that the joint-use driveway be owned by both property owners. That is, the driveway should be located precisely straddling the property line dividing the two establishments. This practice will not enable either owner the opportunity to deny or restrict access to his neighbor's property.

A perpetual easement and maintenance agreement should be recorded on both properties to ensure the optimum use and condition.

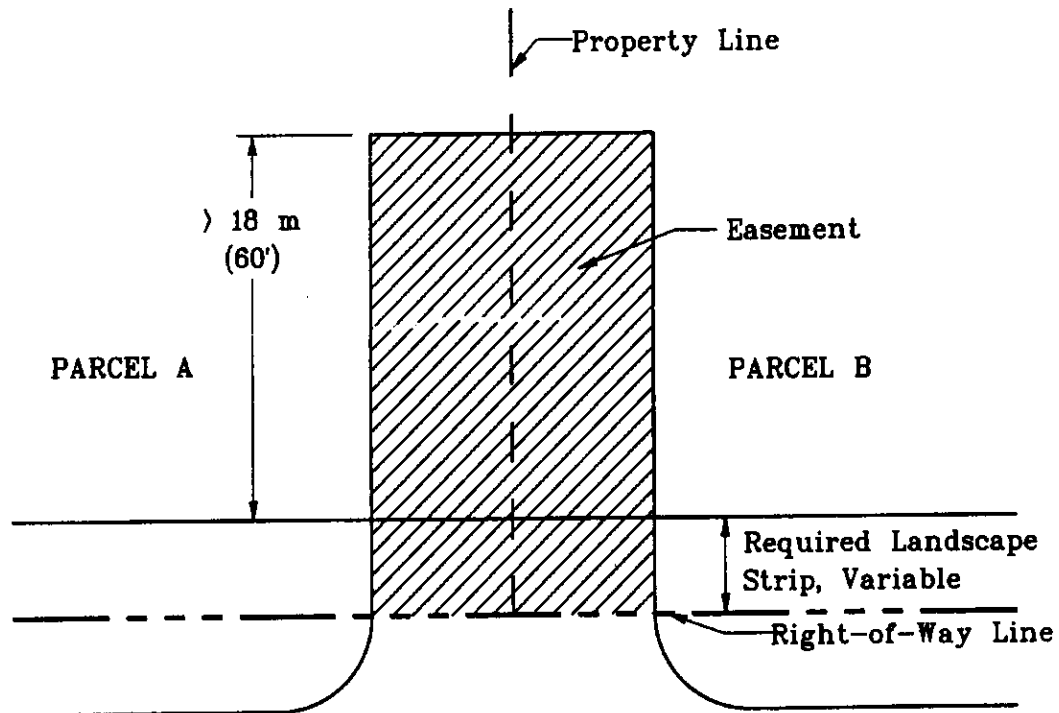


FIGURE 6.1 : JOINT DRIVEWAY

SECTION 7 : LOCATION OF DRIVEWAYS

Driveways shall be located as to result in no undue interference with, or hazard to, the free movement of normal vehicular traffic and so that areas of traffic congestions will not be created on the highway. In accordance with this principle, driveways shall be located where the highway alignment and profile are favorable. There should be no sharp curves, steep grades, or sight distance restrictions. To the extent feasible within the frontage limits, any driveway should be located at a point of optimum sight distance along the highway. Application may be denied if adequate sight distance can not be obtained.

Where a driveway is provided to a commercial establishment, the highway right-of-way and the adjacent borders shall be reasonably clear so that either the establishment itself or the appropriate sign located outside the right-of-way can be seen at a sufficient distance. This will enable proper and safe maneuvering by the motorist desiring to enter the establishment.

Driveways should not be situated within the functional boundary of intersections. This boundary would include the longitudinal limits of auxiliary lanes. The functional boundary should be larger than the physical boundary of the intersection. Figures 7.1 thru 7.3 illustrate these boundaries.

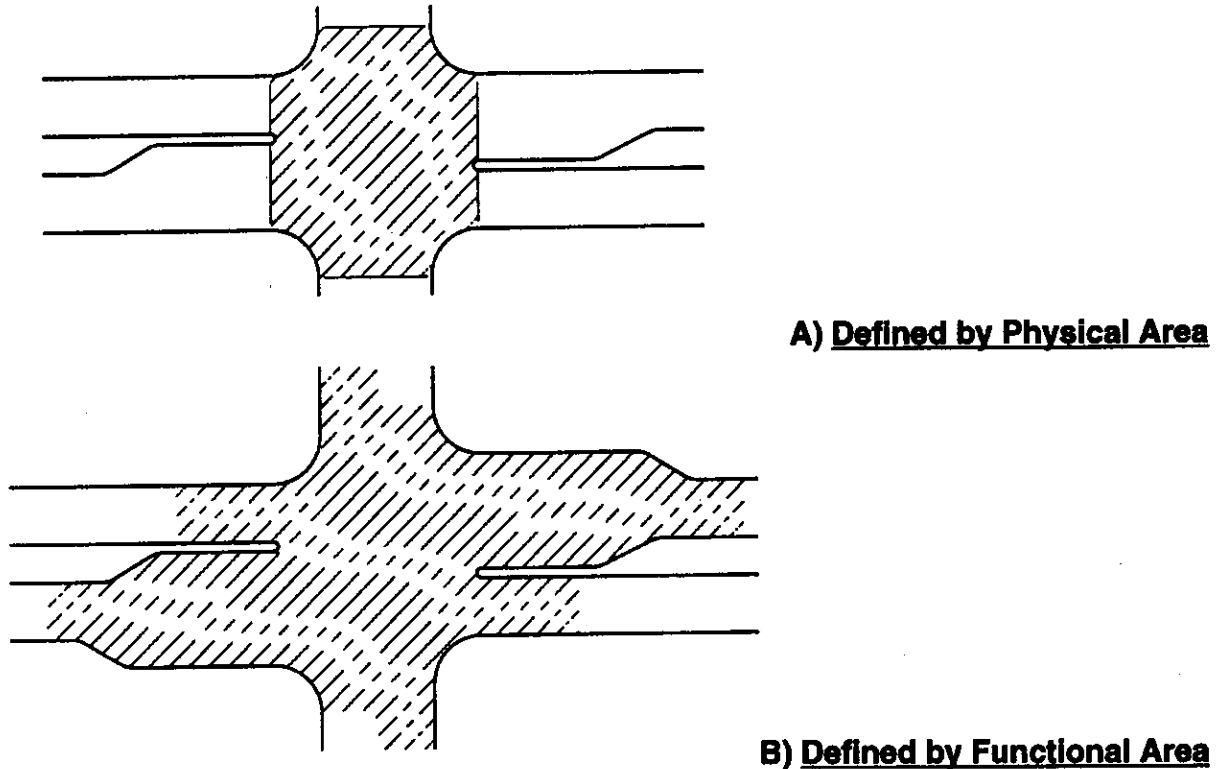


FIGURE 7.1 : BOUNDARY OF INTERSECTION

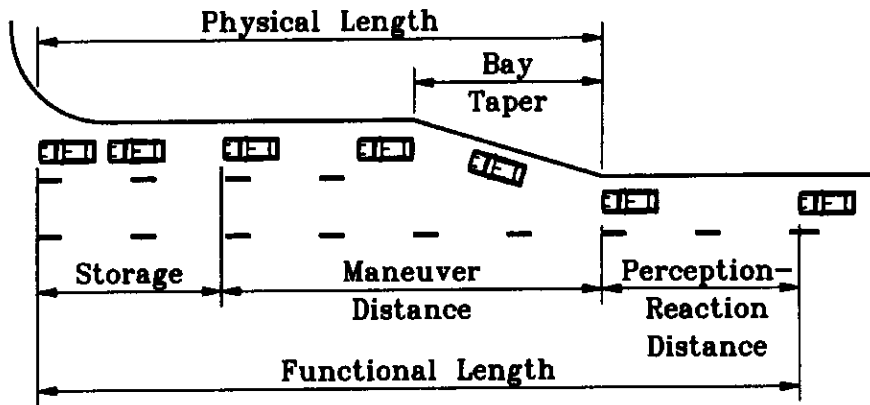
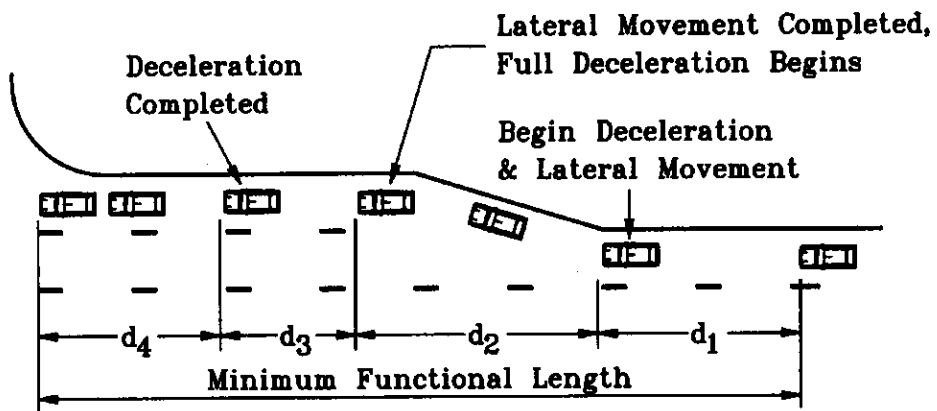


FIGURE 7.2 : ELEMENTS OF THE FUNCTIONAL AREA OF INTERSECTION



- d_1 = distance traveled during perception-reaction time
- d_2 = distance traveled while driver decelerates and maneuvers laterally
- d_3 = distance traveled during full deceleration and coming to a stop or to a speed at which the turn can be comfortably executed
- d_4 = storage length

FIGURE 7.3 : DETERMINANTS OF INTERSECTION MANEUVER DISTANCE

If opposing drives cannot be built directly opposite, and space allows, a minimum separation distance of 90 m (300 feet) should be used for the offset. Where traffic signal warrants may be satisfied, a driveway should be situated opposite a 3- leg intersection. Also, consideration should be given to making the driveway a one-way operation intended to facilitate better traffic movement by reducing the “stream” friction between opposing traffic.

Whenever separate parcels are assembled under one purpose, plan entity, or usage, the existing access driveways should be consolidated. This requires specific changes on commercial sites when they are assembled for development or re-development. The consolidation is accomplished by voiding existing driveway permits upon alteration of the property functions. The new permit authorization depends on the developer’s plans to use some existing driveways and close or relocate other driveways.

SECTION 8 : SEPARATION DISTANCE

The distance between driveways must allow driveway vehicles to safely accelerate, decelerate, and cross traffic streams without excessive interference with thru traffic or traffic using adjacent driveways. Thus, the minimum spacing is related to the operational characteristics of the highway and interactions between adjacent driveways. Such interactions include conflicts between vehicles entering the traffic stream simultaneously from adjacent driveways and blocking of the adjacent driveways by left-turn queues. Table 8.1 shows the minimum recommended spacing for various highway speeds. The spacing is the clear distance between the near edges of the driveway throats.

TABLE 8.1 : MINIMUM SEPARATION OF ADJACENT DRIVEWAYS

Highway Speed		Minimum Spacing	
Km/h	mph	meters	feet
50	30	60	185
60	35	75	245
65	40	95	300
75	45	110	350
80	50	120	395
90	55	135	435

SECTION 9 : PROPERTY CLEARANCE

A minimum property clearance of 8 m (25 feet) is necessary to allow a vehicle to perform the maneuver from one driveway to another with a minimal turning path. The recommended property clearances shown on the table 9.1 should serve as a guideline if minimum driveway separation distances cannot be implemented directly.

TABLE 9.1 : RECOMMENDED PROPERTY CLEARANCE

Highway Speed		Property Clearance	
Km/h	mph	meters	feet
35	20	12	40
40	25	15	50
50	30	18	60
60	35	25	75
65	40	30	90
75	45	35	115

SECTION 10 : CORNER CLEARANCE

Minimum corner clearance moves the basic driveway conflict area away from the vicinity of an intersection by regulating the distance from the driveway to the intersection. The objective of this technique is to increase average spacing of access points along the highway. The consolidation of driveways reduces the number of access points and thereby increases the spacing of driveways. The increase in driveway spacing results in larger stopping sight distances and longer driver perception times.

At signalized intersections, the minimum corner clearance should be equal to the average signal queue length. This will prevent blockage of driveways upstream of the intersection due to standing traffic queues.

At unsignalized intersections, corner clearance distances need only be sufficient to ensure adequate and unrestricted turning movements by driveway traffic.

SECTION 11 : SIGHT DISTANCE

To the extent feasible within the frontage limits, any driveway should be located at a point of optimum sight distance along the highway.

Where a driveway is provided to a commercial establishment, the buffer area and the adjacent border shall be reasonably clear so that either the establishment itself or the appropriate sign located outside the right-of-way can be seen at a sufficient distance to enable proper and safe maneuvering on the part of the drivers desiring to enter the establishment.

The profile of the driveway and the grading of the buffer area shall be such that a driver of a vehicle that is waiting on the driveway outside the edge of the traveled way can see sufficient distance in both directions along the highway traveled way to enable him/her to enter the highway without creating a hazardous situation. Inadequate sight distance may be a cause for denial of the permit.

The minimum sight distance available on a roadway should be sufficiently long to enable a vehicle traveling at or near the design speed to stop before reaching a stationary object in its path. This distance is dependent on the height of the driver's eye above the road surface, the specified object height above the road surface, and the height of sight obstructions within the line of sight. For all sight distance calculations, the height of the driver's eye is considered to be 1.07 m (3.50 feet) above the road surface. For stopping sight distance calculations, the height of object is considered to be 150 mm (6 inches) above the road surface. (Note: Separate stopping sight distances for trucks and passenger cars are not used in highway design standards)

Stopping sight distance is the sum of two distances:

- i) The distances traversed by the vehicle from the instant the driver sights an object necessitating a stop to the instant the brakes are applied.
- ii) The distance required to stop the vehicle from the instant brake application begins. These are referred to as brake reaction distance and braking distance respectively.

The minimum safe stopping distance on level roadways or grades may be calculated by use of the following formulas:

On Level roadway

$$d=0.28Vt + (V^2/253f) \quad (\text{Metric})$$

$$d=1.47Vt + (V^2/30f) \quad (\text{English})$$

On grade

$$d=0.28Vt + V^2/(253(f+G)) \quad (\text{Metric})$$

$$d=1.47Vt + V^2/(30(f+G)) \quad (\text{English})$$

where d= distance (in meters or feet)
v= speed (in km/h or mph)
t= reaction time, 2.5 seconds
f= coefficient of friction
g= grade, in decimal percent

Brake reaction time is the interval between the instant that the driver recognizes the existence of an object or hazard on the roadway ahead and the instant that the driver actually applies the brakes. For most drivers, except in the most complex conditions encountered, a reaction time of 2.5 seconds is adequate.

For braking distance, the “f” factor is used as an overall values that is representative for the whole of the speed change. Measurement show that “f” is not the same for all speeds, it decreases as the initial speed increases. It varies considerably because of many physical elements such as tire air pressure, composition of tires, tire tread pattern, type and condition of the pavement surface and the presence of water, mud, ice, or snow. Because of the lower coefficients of friction on wet pavements as compared with dry, the wet condition governs in determining stopping distances used in design. (Note: Braking distance also depends on the braking system of the vehicle).

Values for the minimum stopping sight distance based on the prevailing speed range is provided in the table 11.1 and 11.2.

TABLE 11.1 : SIGHT DISTANCES (METRIC)

Posted Speed Limit (km/h)	Prevailing Speed Range (km/h)	Brake Reaction Distance (meters)	F (Wet)	Braking Distance (Level) (meters)	Stopping Sight Distance (meters)
50	42-61	29-43	0.35	20-42	49-85
60	52-71	36-50	0.34	31-59	67-109
70	62-81	43-57	0.32	47-81	90-138
80	72-91	50-64	0.31	66-106	116-170
90	82-101	57-71	0.30	89-134	146-205
100	92-111	64-78	0.30	112-162	176-240

TABLE 11.2 : SIGHT DISTANCES (ENGLISH)

Posted Speed Limit (mph)	Prevailing Speed Range (mph)	Brake Reaction Distance (feet)	F (Wet)	Braking Distance (Level) (feet)	Stopping Sight Distance (feet)
30	25-37	92-136	0.35	60-131	152-267
35	30-42	110-155	0.34	88-173	198-328
40	35-47	129-173	0.32	128-230	257-403
45	40-52	147-191	0.30	172-291	319-482
50	45-57	166-210	0.30	225-361	391-571
55	50-62	184-288	0.30	278-427	462-655
60	55-67	202-246	0.29	348-516	550-762
65	60-72	221-265	0.29	414-596	635-861

SECTION 12 : DRIVEWAY EXITING LANES

Frequently, left and right traffic turning movements share a single lane on the exiting driveway approach to the highway. When this occurs, vehicles with different movements do not have simultaneous access to highway traffic gaps; nor can more than one vehicle with the same movement use the same gap.

Left turn movements will generally experience longer delays than other movements because of nature and priority of movement. All vehicles in a shared lane experience increased delay over the condition in which left turns have a separate lane. All vehicles will experience some decrease in delay if a separate lane is provided for left and right turn movements.

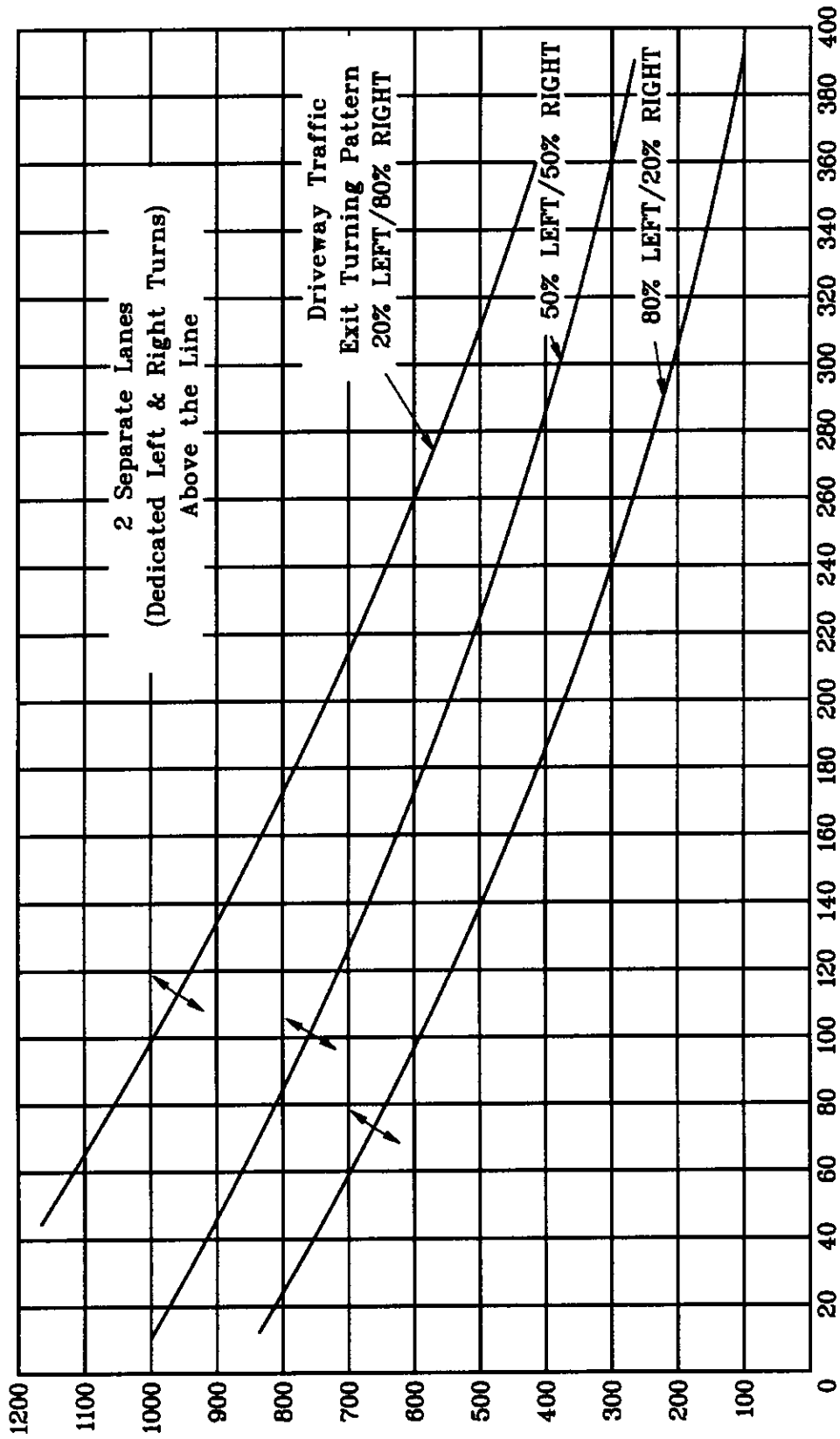
However, depending upon highway traffic volume, exiting traffic volume and turning movement patterns, and the desired level of service, right turn vehicles may not be significantly better served by an exclusive lane. Figures 12.1, 12.2, 12.3, and 12.4, for the specified number of highway lanes and speed limit, establish when it is beneficial to improve traffic flow by going from a shared lane to exclusive turn lanes.

For example, assuming the driveway approaches a two lane highway with a 90 km/h (55 mph) posted speed limit, a 240 vehicle per hour exiting traffic volume, with 80% left turn exiting maneuvers, can satisfactorily be served by a single exiting lane as long as mainline traffic volume is below 300 VPH (reference Figure 12.1). If mainline traffic volume is greater than 300 VPH, then dedicated right and left exit turning lanes should be constructed for operational efficiency. However, if only 20% of this exiting traffic volume makes a left turn, then mainline traffic volume can be up to 640 VPH before dedicated right and left turning exit lanes would be preferred over a single shared lane.

It is intended to maintain a minimal Level of Service "C", as defined in the Highway Capacity Manual. (Dedicated, exclusive lanes for right and left turning movements may also be considered if the applicant desires to provide a level of service above "C"). Highway traffic is assumed to be equally divided between each travel direction. The need for exclusive lanes is reduced when a "Yield" rather than "Stop" condition exists or a right turn acceleration lane is provided. The need for exclusive lanes is increased when sight distance is restricted or as grade increases/decreases from level.

FIGURE 12.1 : 2-LANE HIGHWAY - 90 KMPH (55 MPH)
 (NO. OF EXITING LANES)

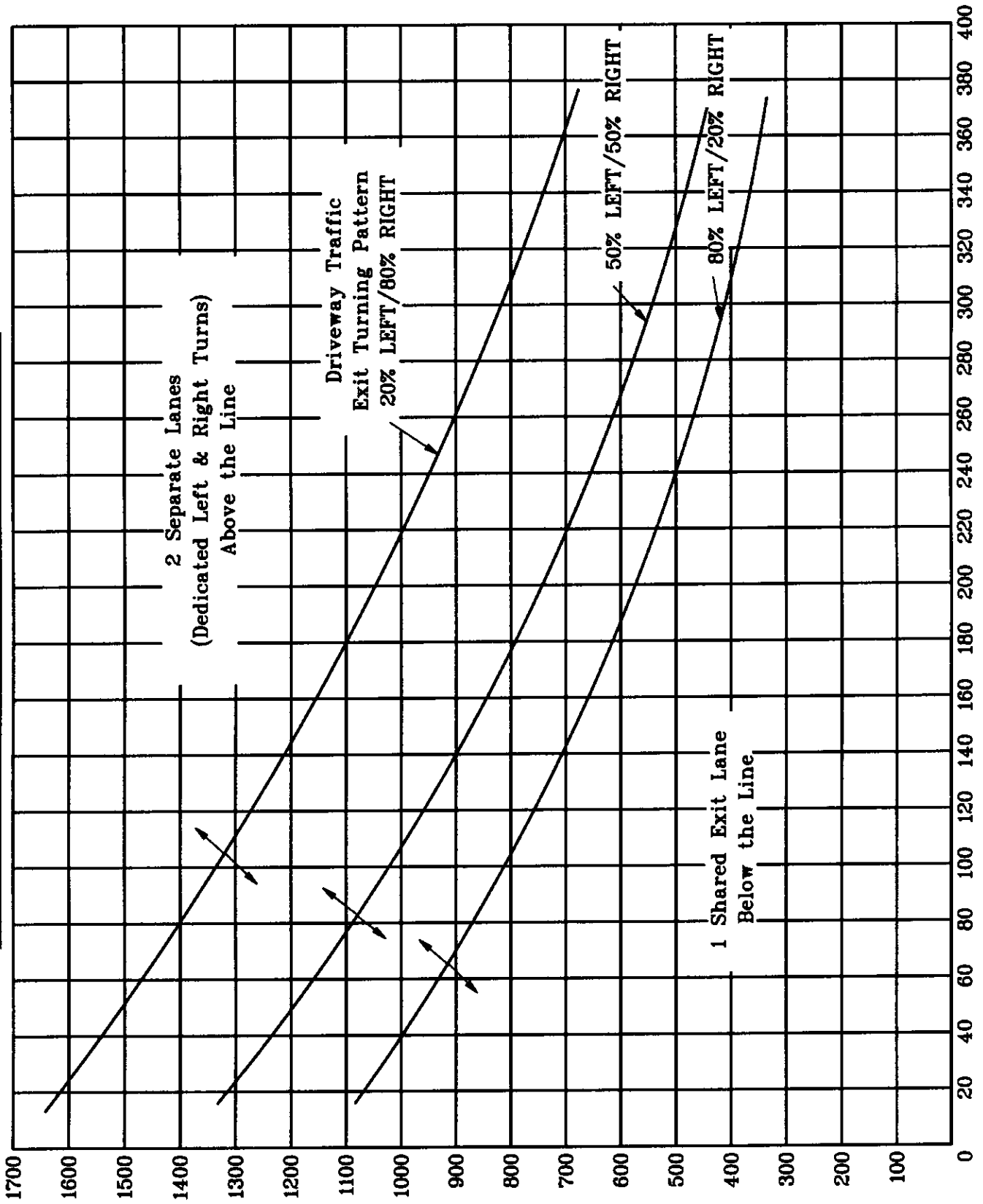
V.P.H.
 (Mainline)



V.P.H.(Drive) - exiting only

FIGURE 12.2 : 2-LANE HIGHWAY - 50 KMPH (30 MPH)
(NO. OF EXITING LANES)

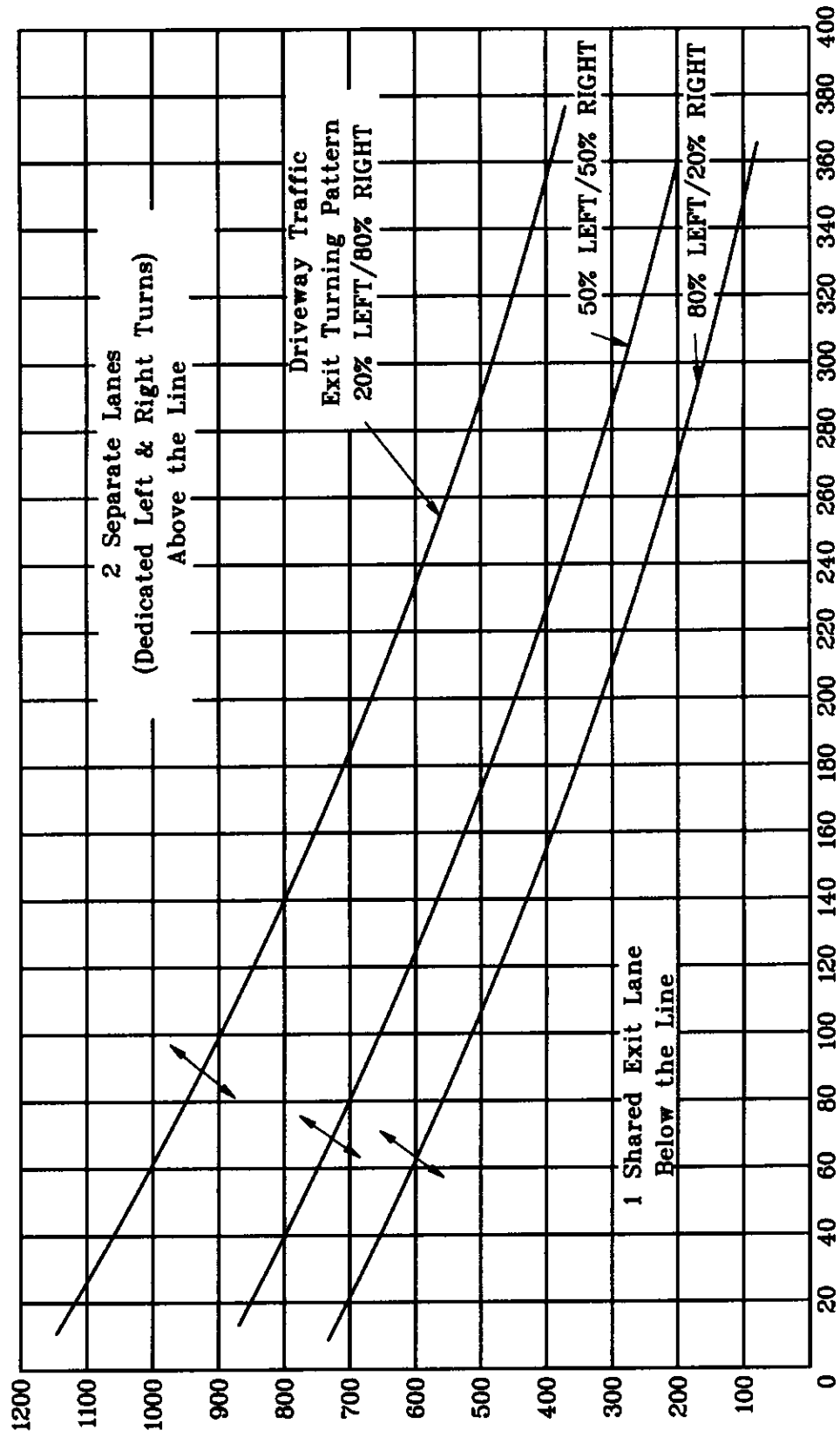
V.P.H.
(Mainline)



V.P.H.(Drive) - exiting only

FIGURE 12.3 : 4-LANE HIGHWAY - 90 KMPH (55 MPH)
 (NO. OF EXITING LANES)

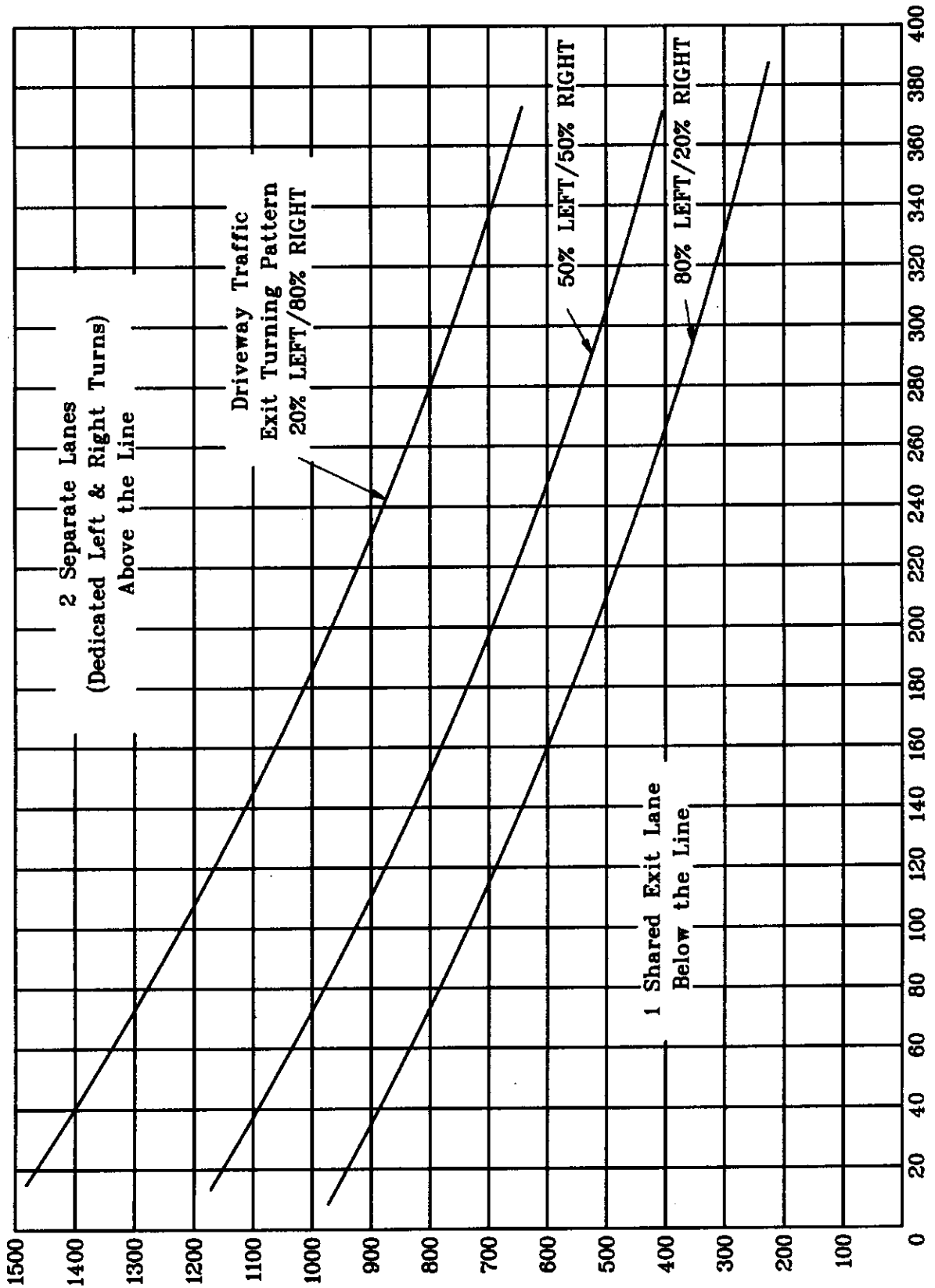
V.P.H.
 (Mainline)



V.P.H.(Drive) - exiting only

FIGURE 12.4 : 4-LANE HIGHWAY - 50 KMPH (30 MPH)
 (NO. OF EXITING LANES)

V.P.H.
 (Mainline)



V.P.H.(Drive) - exiting only

SECTION 13 : DRIVEWAY WIDTH

The driveway width is a function of various parameters including highway and driveway operating conditions, driveway alignment angles, and approach turning radii. The driveway opening width defines the area available for occupancy by driveway vehicles. Large driveway opening widths promote hazardous operational maneuvers unless driveway channelization is provided. A wide driveway opening can be occupied by several vehicles making simultaneous entering and exiting maneuvers.

For roads without curbs, driveway width should be measured exclusive of radii or flares.

For roads with curbs, the driveway width should be measured behind the flared section.

Following is the criteria for the driveway width:

1. 5.0-7.5 m (16-24 feet) should be used for 1-way accesses.
2. 5.0-7.5 m (16-24 feet) should be used for 2-way accesses if the single-unit vehicle volume does not exceed 5 DHV.
3. 7.5-11 m (25-35 feet) should be used for 2-way accesses if one or more of the following apply.
 - a) Vehicle volume exceeds 5 DHV.
 - b) Multi-unit vehicles will use the access.
 - c) Single-unit vehicles of more than 10.0 m (30 feet) in length will use the access.
 - d) Vehicles of more than 5.0 m (16 feet) in width will use the access.

The above criteria does not apply to the access(es) where additional lanes are required to facilitate the traffic coming out of driveway, or if the access is intended to become a public road.

SECTION 14 : CORNER RADII

The three principal considerations for setting driveway corner radii are:

- a) availability of right-of-way
- b) safety and ease of vehicle movement
- c) pedestrian movement and safety

Typically, sufficient right-of-way is available to construct in its entirety the driveway approach configuration on State Property; but, if necessary because of dimensional configuration requirements or minimal highway right-of-way, the approach can be expanded back onto the applicant's property. Increasing corner radii at the driveway approach provides smoother right turns, reduces driveway throat width, and reduces the negative effect right turns have on capacity of through traffic. Increasing a radius, however, can have adverse safety effects on pedestrian activity by increasing exposure to traffic.

Driveways with wide approach corner radii will allow vehicles approaching in the same lane to stop side-by-side (see Figure 14.1). This will act to reduce or eliminate the adverse impact where several turning movements share the same lane. However, large radii, i.e., radii in excess of 10 m (35 feet), often create placement locational problems for traffic signals and other control devices.

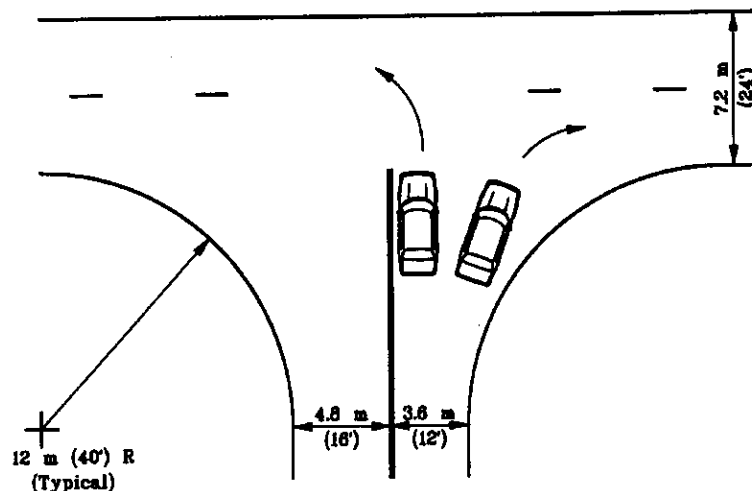


FIGURE 14.1 : MULTIPLE TURNING MOVEMENTS

Selection of appropriate design radii are based on the largest standard or typical vehicle type that would regularly use the driveway (i.e., the presence of an infrequent large truck is not a controlling factor where the driveway traffic is predominately passenger cars). Consideration should be given to the type or ease of turn to be accomplished by the design vehicle where it is desirable for vehicles to turn at a higher speed (i.e., for high volume turns or turns off high speed streets), larger radii maybe appropriate. Geometric elements such as angle of intersection, curvature, grades, auxiliary lanes, cross section, and adjacent driveways must also be taken into account.

Table 14.1 summarizes the operational characteristics of various radii for a range of design vehicles.

Table 14.1 OPERATIONAL CHARACTERISTICS OF CORNER RADII *

Corner Radius		Operational Characteristics *
meters	feet	
3	10	Crawl speed turn for P vehicle
6-9	20-30	Low speed turn for P vehicle, crawl speed turn for single-unit vehicle with minor lane encroachment
12	40	Moderate speed turn for P vehicle, low speed turn for SU vehicle, crawl speed turn for WB-12 (WB-40) or WB-15 (WB-50) with minor lane encroachments
15	50	Moderate speed turns for all vehicles upto WB-15 (WB-50) (exceeds handbook standards)

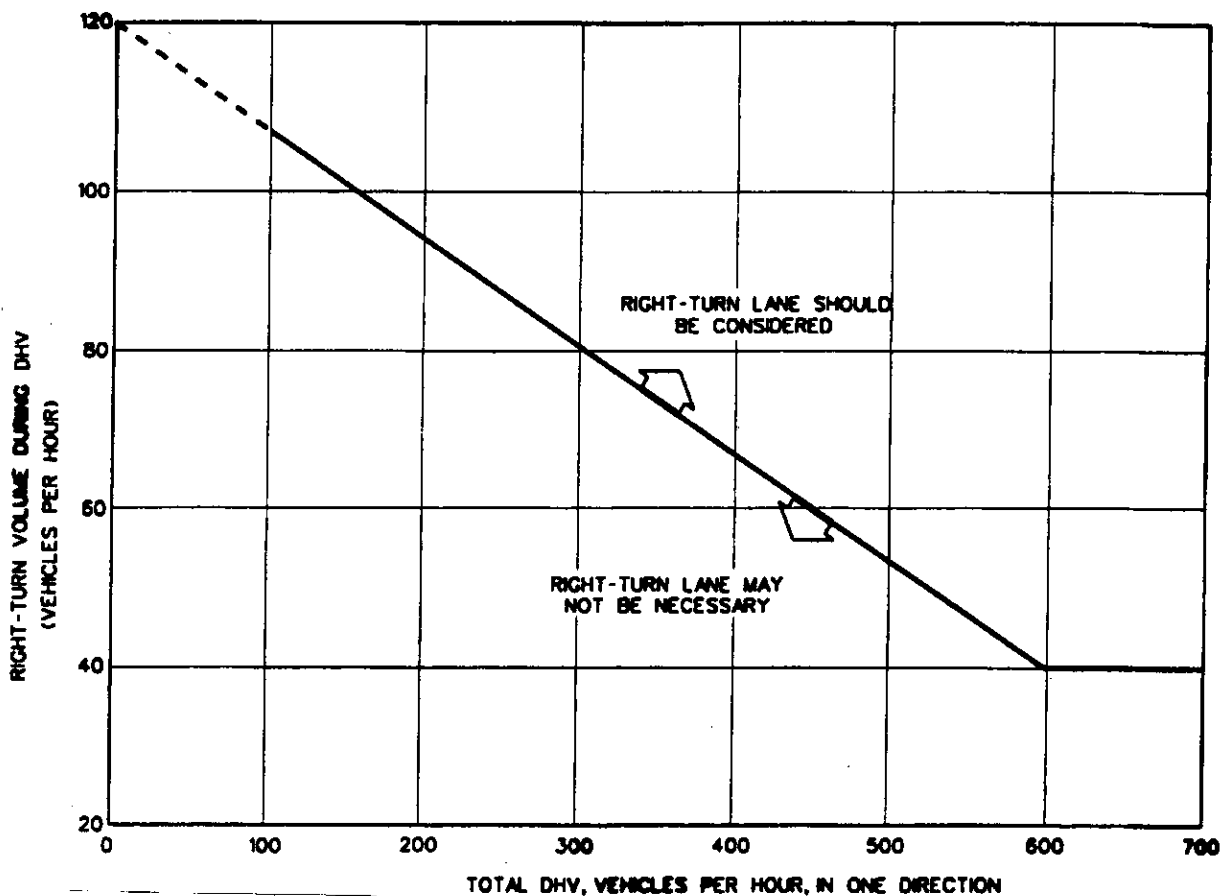
Where: P = Passenger car
 SU = Single Unit Truck
 WB = Wheel Base

*Assuming approach and departure occur in curb lane.

SECTION 15 : RIGHT TURN LANES ON 2-LANE HIGHWAYS

A right turn lane shall be constructed to a driveway approach that will allow the turning vehicles to decelerate and to enter the approach safely and without creating unnecessary congestion to highway through traffic. A right turn lane will be required when one or more of the following criteria is met :

- a) On rural or urban highways where traffic satisfies the criteria in figure 15.1.
- b) Where a capacity analysis determines a right turn lane is necessary to meet the level-of-service criteria.
- c) Where the accident experience, existing traffic operations, sight distance restrictions (e.g., intersection beyond a crest vertical curve), or engineering judgment indicates a significant conflict related to right turning vehicles.



NOTE : For highways with a design speed below 80 km/h (50 mph) with a DHV < 300 and where right turns > 40, an adjustment should be used. To read the vertical axis of the chart, subtract 20 from the actual number of right turns.

FIGURE 15.1 : GUIDELINES FOR RIGHT TURN LANES ON 2-LANE HIGHWAYS

SECTION 16 : LEFT TURN LANES ON 2-LANE HIGHWAYS

A left turn lane shall be constructed to a driveway approach that will allow the turning vehicles to decelerate and to enter the approach safely and without creating unnecessary congestion to highway through traffic. A left turn lane will be required when one or more of the following criteria is met :

- On rural or urban highways where traffic satisfies the criteria in 16.1 thru 16.5.
- Where a capacity analysis determines a left turn lane is necessary to meet the level-of-service criteria.
- Where the accident experience, existing traffic operations, sight distance restrictions (e.g., intersection beyond a crest vertical curve), or engineering judgment indicates a significant conflict related to left turning vehicles.
- Where an approach is constructed opposite an existing T-intersection making it a 4-legged intersection (required for both approaches).

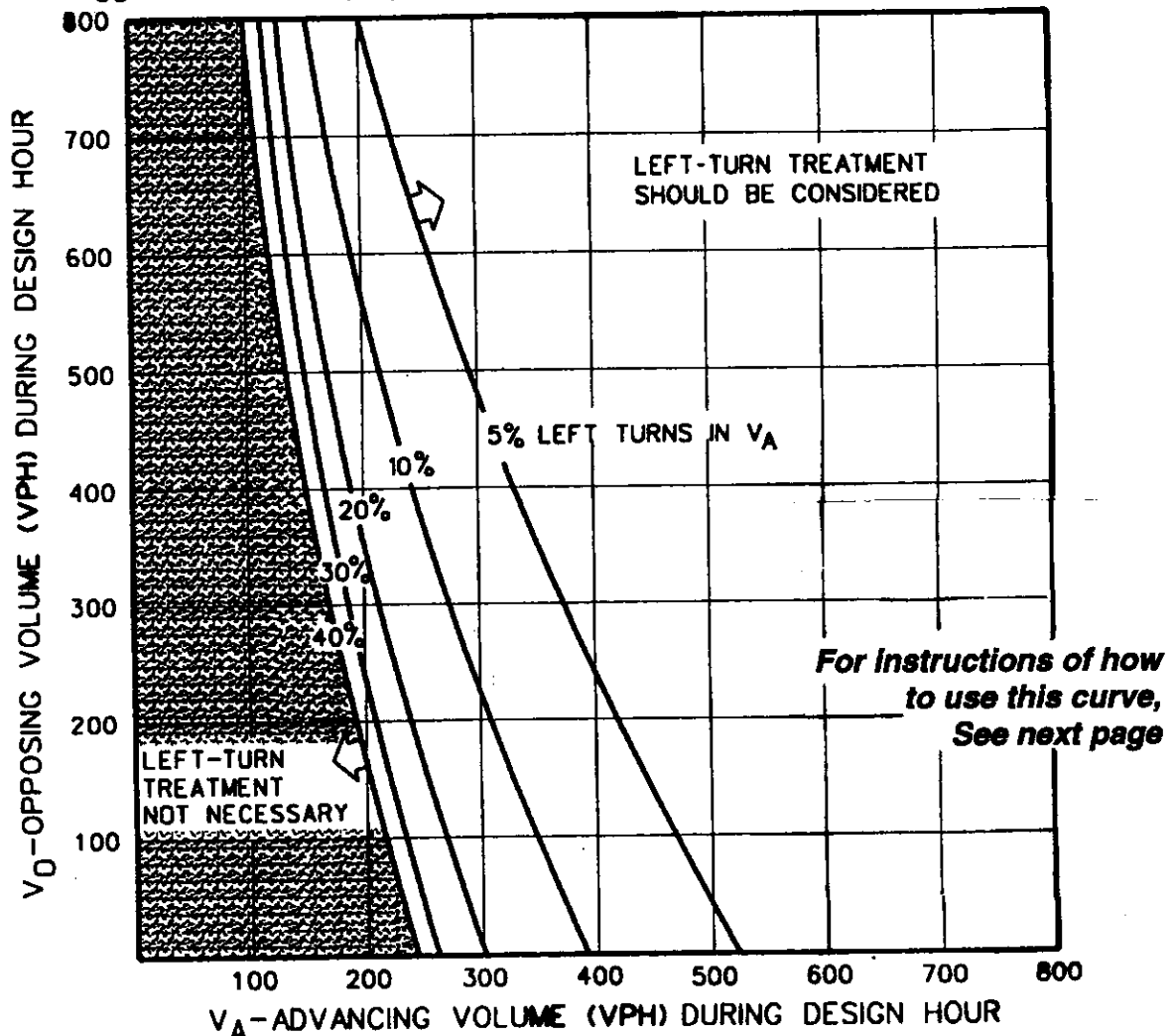
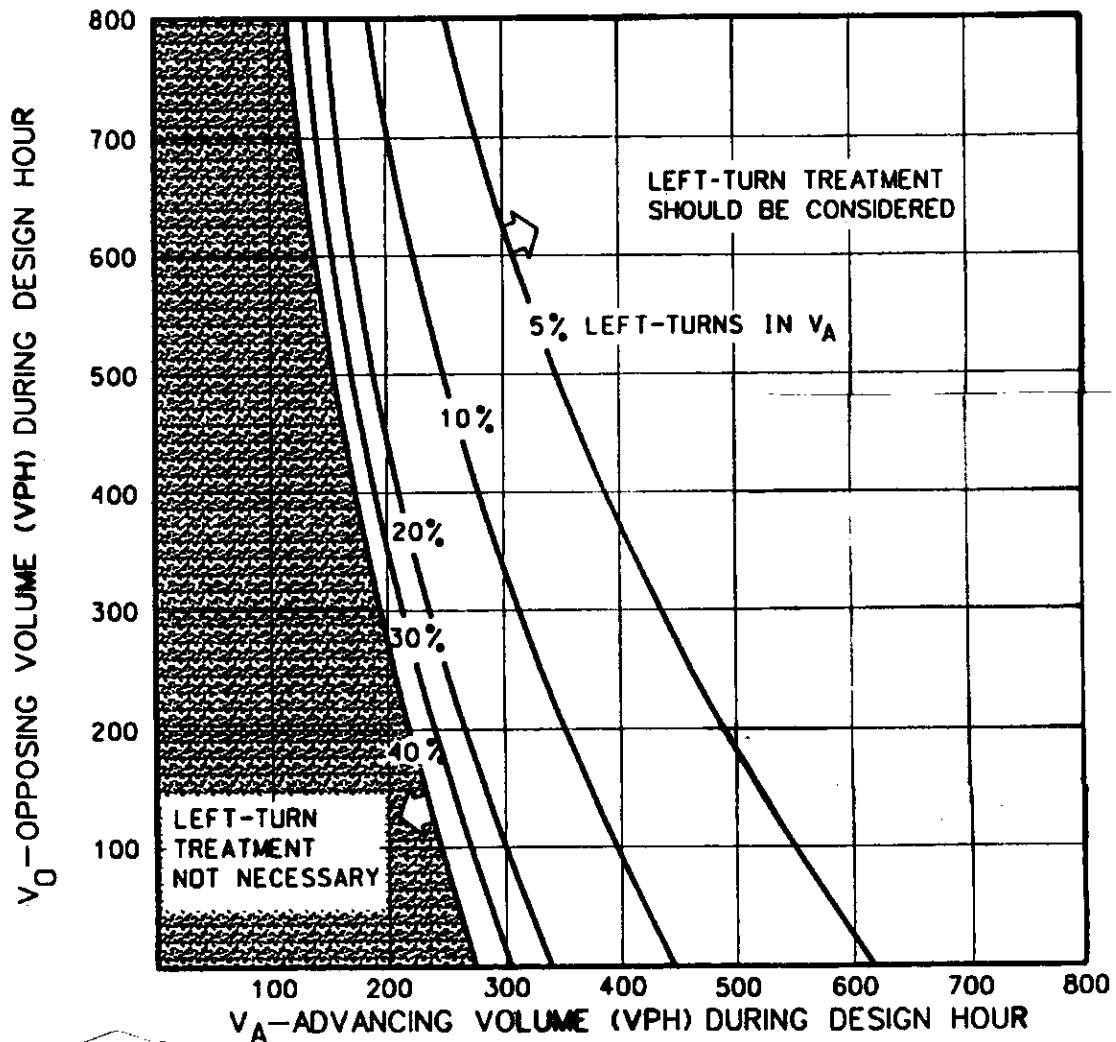


FIGURE 16.1 : GUIDELINES FOR LEFT-TURN LANES ON 2-LANE HIGHWAYS
100 KM/H (60 MPH)

INSTRUCTIONS :

1. The family of curves represent the percent of left turns in the advancing volume (V_A). The designer should locate the curve for the actual percentage of left turns. When this is not an even increment of five, the designer should estimate where the curve lies.
2. Read V_A and V_O into the chart and locate the intersection of the two volumes.
3. Note the location of the point # 2 relative to the line in # 1. If the point is to the right of the line, then a left turn lane should be considered. If the point is to the left of the line, then a left turn lane is not warranted based on traffic volumes.

V_A = Total advancing traffic volume including all turning traffic
 V_O = Total opposing traffic volume including all turning traffic

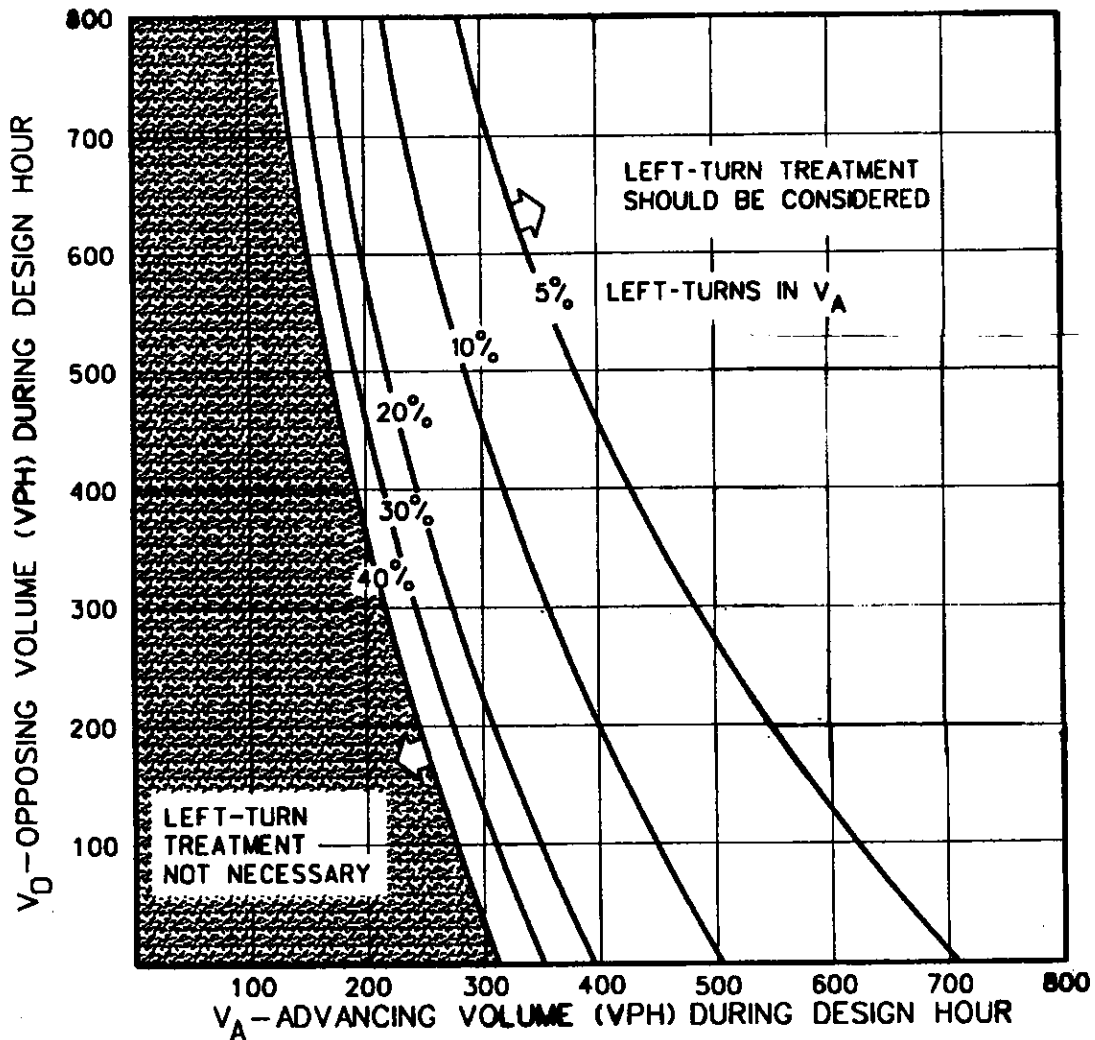


**FIGURE 16.2 : GUIDELINES FOR LEFT-TURN LANES ON 2-LANE HIGHWAYS
90 KM/H (55 MPH)**

INSTRUCTIONS :

1. The family of curves represent the percent of left turns in the advancing volume (V_A). The designer should locate the curve for the actual percentage of left turns. When this is not an even increment of five, the designer should estimate where the curve lies.
2. Read V_A and V_O into the chart and locate the intersection of the two volumes.
3. Note the location of the point # 2 relative to the line in # 1. If the point is to the right of the line, then a left turn lane should be considered. If the point is to the left of the line, then a left turn lane is not warranted based on traffic volumes.

V_A = Total advancing traffic volume including all turning traffic
 V_O = Total opposing traffic volume including all turning traffic

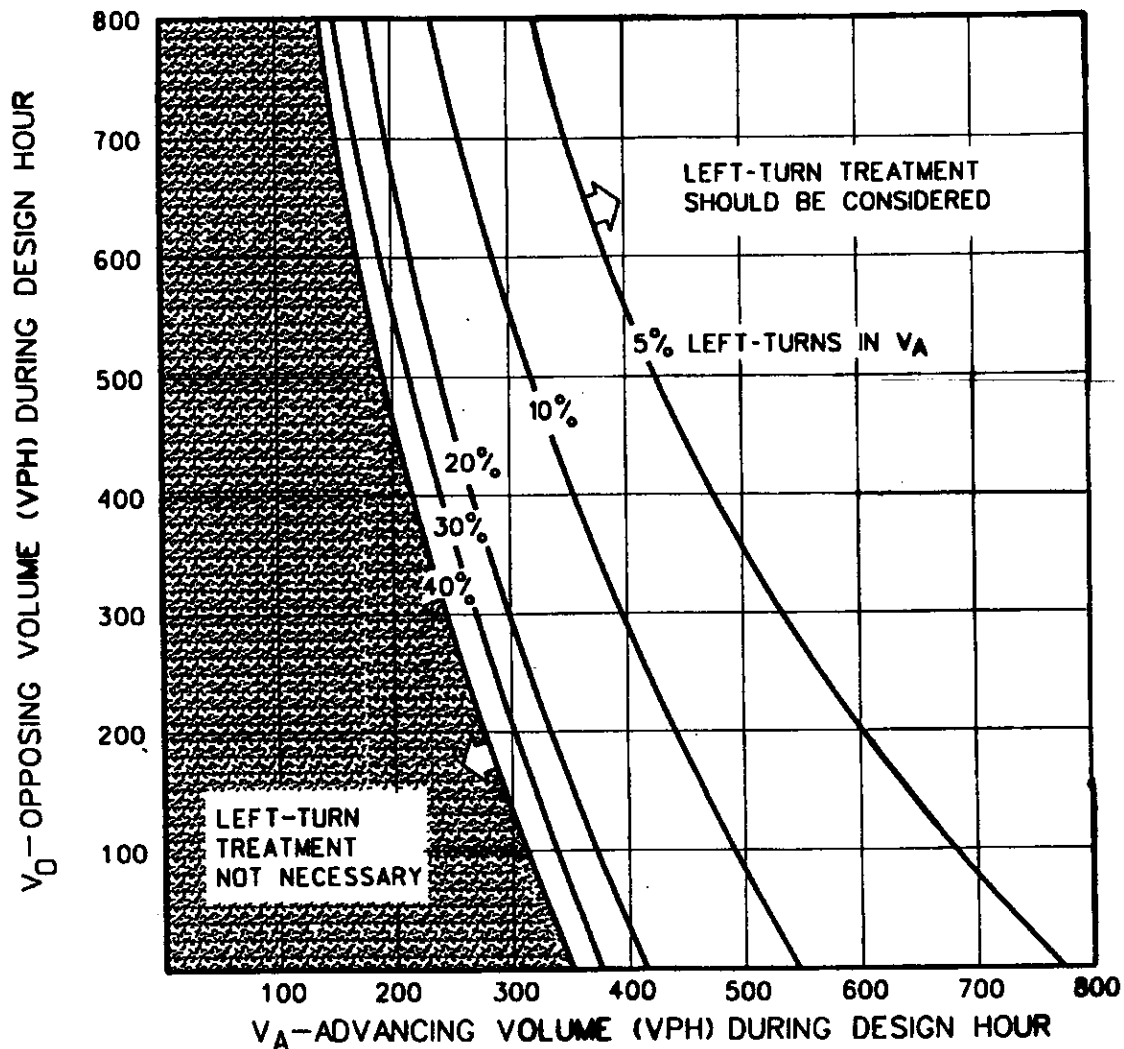


**FIGURE 16.3 : GUIDELINES FOR LEFT-TURN LANES ON 2-LANE HIGHWAYS
80 KM/H (50 MPH)**

INSTRUCTIONS :

1. The family of curves represent the percent of left turns in the advancing volume (V_A). The designer should locate the curve for the actual percentage of left turns. When this is not an even increment of five, the designer should estimate where the curve lies.
2. Read V_A and V_O into the chart and locate the intersection of the two volumes.
3. Note the location of the point # 2 relative to the line in # 1. If the point is to the right of the line, then a left turn lane should be considered. If the point is to the left of the line, then a left turn lane is not warranted based on traffic volumes.

V_A = Total advancing traffic volume including all turning traffic
 V_O = Total opposing traffic volume including all turning traffic

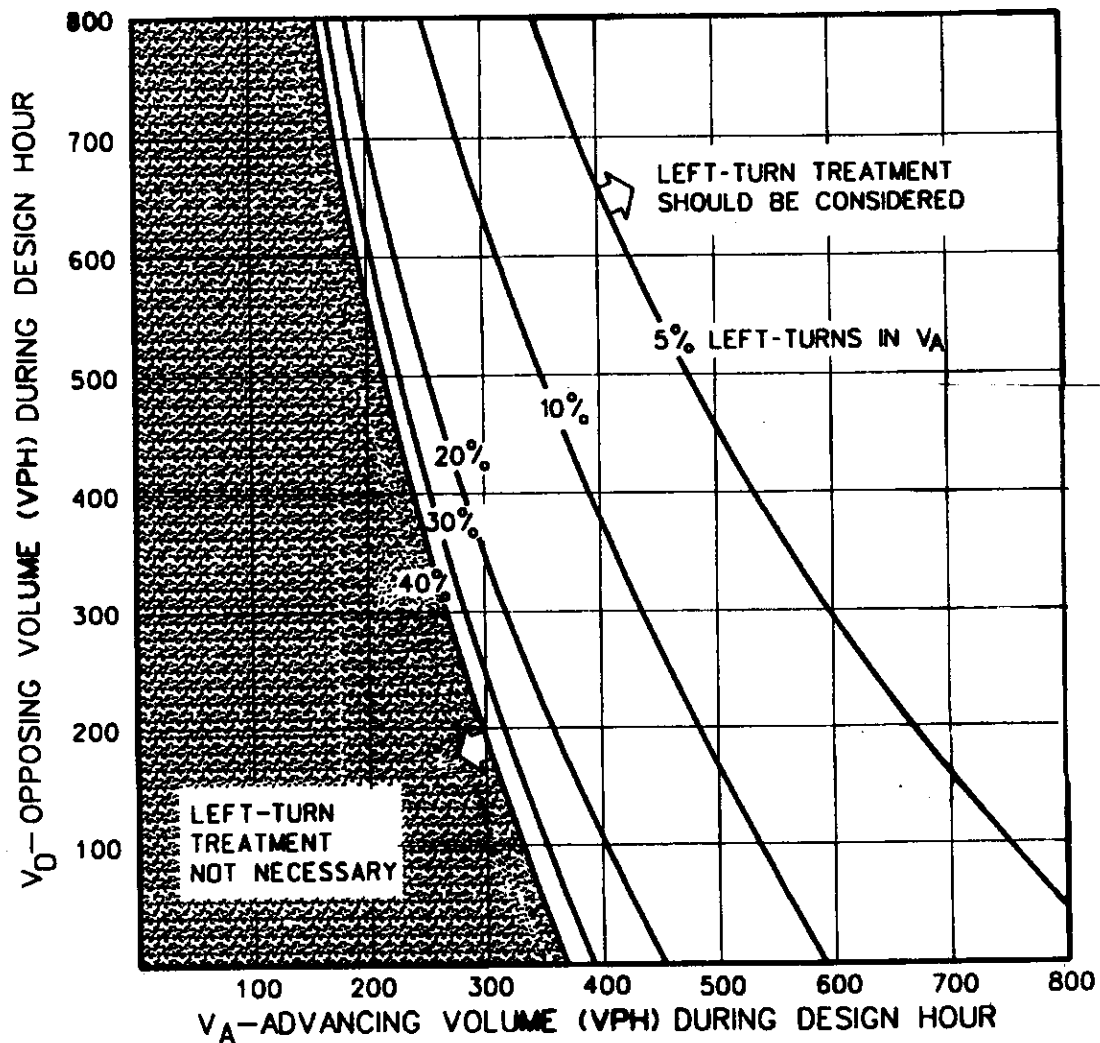


**FIGURE 16.4 : GUIDELINES FOR LEFT-TURN LANES ON 2-LANE HIGHWAYS
70 KM/H (45 MPH)**

INSTRUCTIONS :

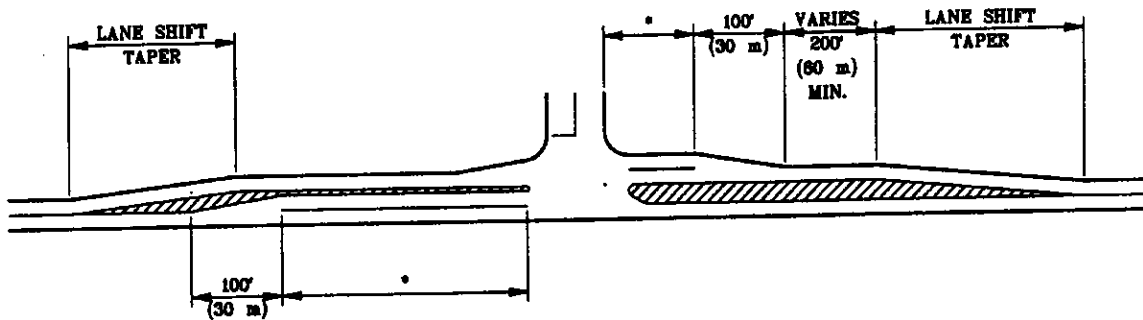
1. The family of curves represent the percent of left turns in the advancing volume (V_A). The designer should locate the curve for the actual percentage of left turns. When this is not an even increment of five, the designer should estimate where the curve lies.
2. Read V_A and V_O into the chart and locate the intersection of the two volumes.
3. Note the location of the point # 2 relative to the line in # 1. If the point is to the right of the line, then a left turn lane should be considered. If the point is to the left of the line, then a left turn lane is not warranted based on traffic volumes.

V_A = Total advancing traffic volume including all turning traffic
 V_O = Total opposing traffic volume including all turning traffic



**FIGURE 16.5 : GUIDELINES FOR LEFT-TURN LANES ON 2-LANE HIGHWAYS
60 KM/H (40 MPH)**

The design of the channelized left turn lane shall have an appearance as shown in figure 16.6.



* See Section 20 for minimum turn lengths.

FIGURE 16.6 : CHANNELIZED LEFT TURN LANE FOR 2-LANE HIGHWAY

Design Speed		Lane Shift Taper Rates
km/h	mph	
30	20	10:1
40	25	15:1
50	30	20:1
60	40	25:1
70	45	45:1
80	50	50:1
90	55	60:1
100	65	65:1
110	70	70:1
120	75	75:1

SECTION 17 : PASSING BLISTER ON 2-LANE HIGHWAYS

On 2-lane highways with a design year ADT of 5000 or greater, if the traffic does not warrant a dedicated left turn lane, the construction of a passing blister should be considered to relieve congestion due to left-turning vehicles.

On 2-lane highways with a design year ADT less than 5000, the construction of a passing blister should be considered only if one or more of the following criteria is met:

1. There are 20 or more vehicles turning into driveway during the design hour.
2. Accident reports or site evidence (such as skid marks in the through lane displaying emergency braking) indicate potential problems with vehicles turning into driveway.

The design of passing blister shall include appropriate treatments to drainage, side slopes, and other private or commercial approaches within the area disturbed by the passing blister construction. Where adequate right-of-way width to construct the passing blister is not available, the conditions shall be fully identified, explained, and documented as a part of the permit application package. Position and minimum lengths of lanes and tapers for the passing blister are shown in Figure 17.1 & Table 17.1.

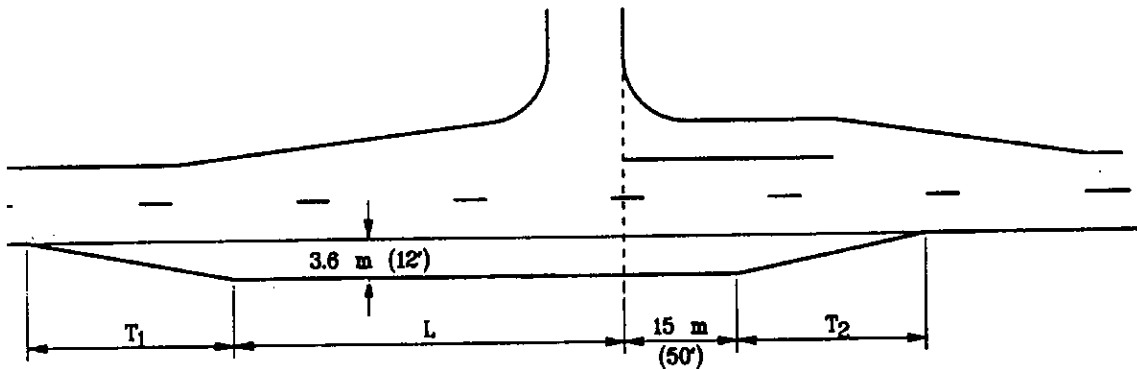


FIGURE 17.1 : PASSING BLISTER

TABLE 17.1 : MINIMUM DIMENSIONS FOR PASSING BLISTERS

Design Speed		T ₁		L		T ₂	
km/h	mph	meters	feet	meters	feet	meters	feet
50	31	45	148	45	148	45	148
>50 - <80	>31 - <48	60	197	45	148	60	197
>80	>48	90	296	60	197	90	296

SECTION 18 : RIGHT TURN LANES ON 4-LANE HIGHWAYS

A right turn lane shall be constructed to a driveway approach that will allow the turning vehicles to decelerate and to enter the approach safely and without creating unnecessary congestion to highway through traffic. A right turn will be required when one or more of the following criteria is met :

- a) On rural or urban highways where traffic satisfies the criteria in figure 18.1.
- b) Where a capacity analysis determines a right turn lane is necessary to meet the level-of-service criteria.
- c) Where the accident experience, existing traffic operations, sight distance restrictions (e.g., intersection beyond a crest vertical curve), or engineering judgment indicates a significant conflict related to right turning vehicles.

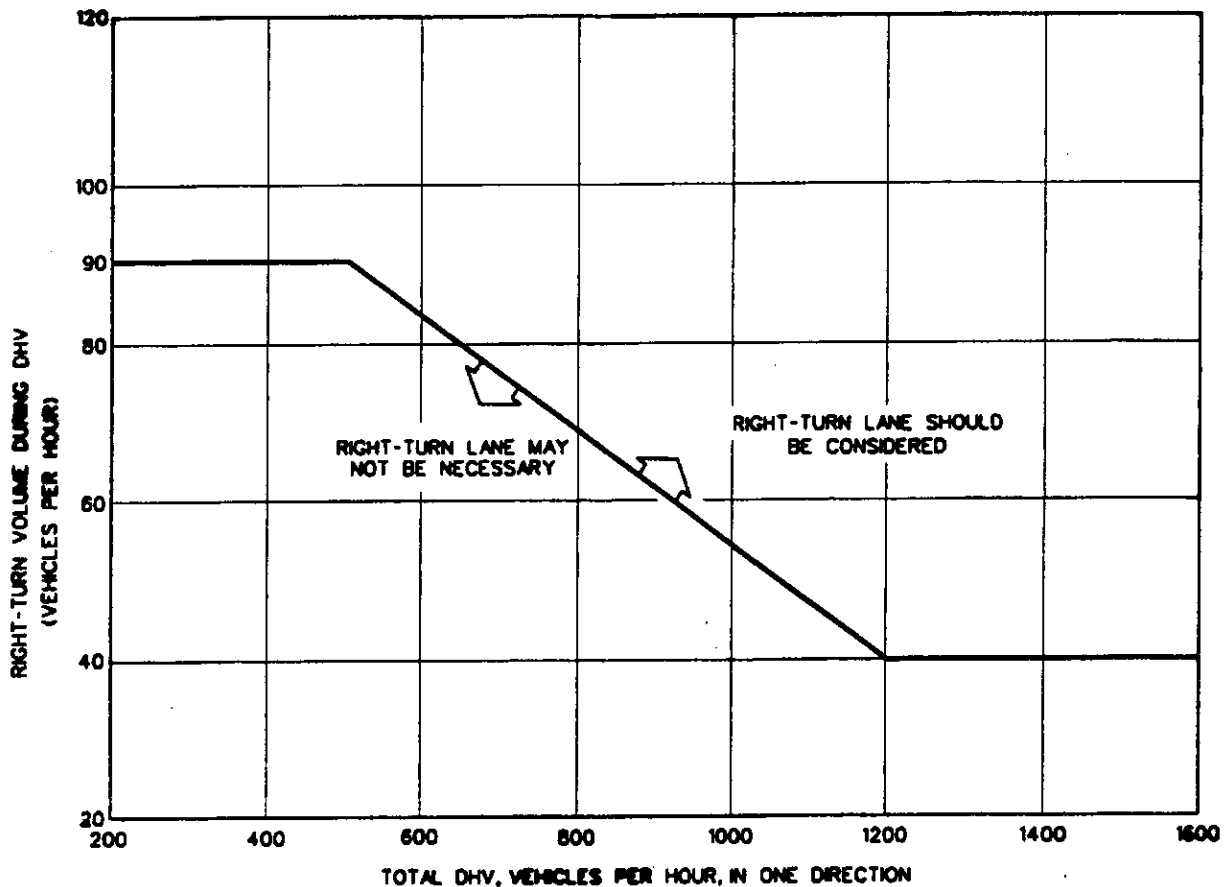


Figure is only applicable on highways with a design speed of 80 km/h (50 mph) or greater. For speeds less than 80 km/h (50 mph), see Section 18 (b,c).

FIGURE 18.1 : GUIDELINES FOR RIGHT TURN LANES ON 4-LANE HIGHWAYS

SECTION 19 : LEFT TURN LANES ON 4-LANE HIGHWAYS

A Left turn lane shall be constructed to a driveway approach that will allow the turning vehicles to decelerate and to enter the approach safely and without creating unnecessary congestion to highway through traffic. A left turn will be required when one or more of the following criteria is met.

- a)** On rural or urban divided highways where median width is equal to or greater than 7.3 m (24 feet), regardless of traffic volume.
- b)** Where an approach is constructed opposite an existing T-intersection making it a 4-legged intersection (required for both approaches).
- c)** Where a capacity analysis determines a left turn lane is necessary to meet the level-of-service criteria.
- d)** Where the accident experience, existing traffic operations, sight distance restrictions (e.g., intersection beyond a crest vertical curve), or engineering judgment indicates a significant conflict related to right turning vehicles.

A) TAPER LENGTH (L_T): For tangent approaches, INDOT’s practice is to use a 30 m (100 feet) straight line taper at the beginning of the auxiliary turn lane. On curvilinear alignments, the entrance taper should typically be designed with a constant rate of divergence throughout the curve. With all alignments, the entrance taper should at least be 15 m (50 feet).

B) STORAGE LENGTH (L_s): The storage length should have sufficient length to accommodate the expected number of turning vehicles likely to arrive in an average 2 minute period within the design hour.

B.1) Unsignalized Intersections: The recommended storage lengths at unsignalized intersections for right and left turn lanes are provided in the table 20.2

TABLE 20.2 STORAGE LENGTHS FOR UNSIGNALIZED INTERSECTIONS

Turning DHV (vph)	Storage Length (L_s)	
	meters	feet
60 or less	15-25	50-85
61-120	30	100
121-180	45	150
180 or more	60 or greater	200 or greater

B.2) Signalized Intersections: For signal cycle less than 2 minutes, the storage length should be based on 2 times the average number of vehicles that would store per cycle during the design hour. For a signal cycle of 2 minutes or greater, the storage length should be based on 1.5 times the average number of vehicles that would store per cycle during the design hour. Average vehicle length is assumed to be 6 m (20 feet).

C) LENGTH OF DECELERATION (L_D): For rural facilities, the deceleration distance should meet the criteria given in table 20.3. These values should be adjusted for grades (values of grade adjustment factors are given in table 20.4). These values are desirable on urban facilities; however, under restricted urban conditions, the length of deceleration lane will be zero ($L_D = 0$).

TABLE 20.3 DECELERATION LENGTH FOR TURNING LANES

Design Speed		Average Running Speed ⁽¹⁾		Full-Width Auxiliary ⁽²⁾ Lane L _D	
km/h	mph	km/h	mph	meters	feet
110	70	91	57	185	610
100	60	85	53	165	545
90	55	77	48	145	480
80	50	70	45	135	440
70	45	63	39	115	370
60	40	55	35	95	315
50	30	47	30	80	255
40	25	40	25	40	135

TABLE 20.4

Grade Adjustment Factor ⁽³⁾			
Downgrade		Upgrade	
6.00% - 5.00%	1.35	5.00% - 6.00%	0.80
4.99% - 4.00%	1.28	4.00% - 4.99%	0.85
3.99% - 3.00%	1.20	3.00% - 3.99%	0.90
2.99% - 2.01%	1.10	2.01% - 2.99%	0.95
2.00% - 0.00%	1.00	0.00% - 2.00%	1.00

- (1) Average running speed assumed for calculations.
- (2) This is the distance needed to allow the vehicle to reduce speed from the average running speed to zero. Values were developed assuming decelerating for 3 seconds in gear and a comfortable braking rate as described in 1965 AASHTO Blue Book.
- (3) Ratio from this table multiplied by the length provided above will give the deceleration length adjusted for grade. Adjustment factors apply to all design speeds.

SECTION 21 : PAVEMENT REQUIREMENTS

All commercial driveways will be hard surface (either bituminous or concrete) from the edge of the mainline pavement to the state right-of-way line. Residential driveways may be gravel and field entrances may be stabilized soil. Care should be taken in the design of parking areas and frontage roads to alleviate possible tracking of gravel or debris onto the mainline pavement.

The cross slope or crown of driveways and turn lanes should be 2% for bituminous pavement or concrete pavement. A compacted shoulder is required adjacent to all commercial driveways and added lanes. The shoulder shall be constructed a minimum of 1.2 m (4 feet) in width and 150 mm (6 in.) in thickness. The slope of the shoulder should be 6%.

If the existing shoulder is bituminous, then the new shoulder should also be bituminous with the thickness of 125 mm (5 in.). The new shoulder should match the existing width with a slope of 4%. Seal coat type 5 (for aggregate), or seal coat type 2 (for asphalt), should be specified if such has been applied to existing shoulder material.

When a turning lane is required, the Department prefers the added lane(s) be constructed out of the same material used for the mainline pavement resulting in a homogenous pavement surface. If it is impractical to construct a homogeneous pavement surface, the abutting edge of the existing mainline pavement shall have as smooth as possible interface with the new pavement (i.e., saw cut).

All materials and their placement should be in accordance with current INDOT Specifications.

The following are the pavement sections that should be used with the respective vehicular traffic.

TABLE 21.1 : RESIDENTIAL DRIVEWAYS

Desired	Minimum
25 mm (1 in.) bituminous surface 2 lifts @ 75 mm (3 in.) bituminous base 75 mm (3 in.) compacted aggregate	150 mm (6 in.) compacted aggregate
or	
150 mm (6 in.) reinforced concrete 75 mm (3 in.) compacted aggregate	

TABLE 21.2 : FIELD ENTRANCES

Desired	Minimum
25 mm (1 in.) bituminous surface 2 lifts @ 75 mm (3 in.) bituminous base 75 mm (3 in.) compacted aggregate	Graded stabilized soil
Or	
150 mm (6 in.) reinforced concrete 75 mm (3 in.) compacted aggregate	

TABLE 21.3 : TURN LANES AND PASSING BLISTERS

Desired	Minimum
25 mm (1 in.) bituminous surface 3 lifts @ 75 mm (3 in.) bituminous base 150 mm (6 in.) compacted aggregate (adequately drained)	Same as mainline pavement (if it is determined to be adequate by the Department)
or	
225 mm (9 in.) reinforced concrete 150 mm (6 in.) compacted aggregate (adequately drained)	

TABLE 21.4 : UTILITY PULL-OFFS

Desired	Minimum
25 mm (1 in.) bituminous surface 2 lifts @ 75 mm (3 in.) bituminous base	150 mm (6 in.) compacted aggregated (adequately drained)
Or	
150 mm (6 in.) reinforced concrete	

TABLE 21.5 : MAILBOX TURNOUTS

Desired	Minimum
25 mm (1 in.) bituminous surface 2 lifts @ 75 mm (3 in.) bituminous base 75 mm (3 in.) compacted aggregate	25 mm (1 in.) bituminous surface 100 mm (4 in.) bituminous base
Or	Or
150 mm (6 in.) reinforced concrete 75 mm (3 in.) compacted aggregate	150 mm (6 in.) reinforced concrete

TABLE 21.6: COMMERCIAL DRIVEWAYS

Desired	Minimum
No Truck Traffic	
25 mm (1 in.) bituminous surface 2 lifts @ 75 mm (3 in.) bituminous base 150 mm (6 in.) compacted aggregated (adequately drained)	150 mm (6 in.) reinforced concrete 150 mm (6 in.) compacted aggregate (adequately drained)
Little Truck Traffic	
25 mm (1 in.) bituminous surface 3 lifts @ 75 mm (3 in.) bituminous base 150 mm (6 in.) compacted aggregate (adequately drained)	200 mm (8 in.) reinforced concrete 150 mm (6 in.) compacted aggregate (adequately drained)
Heavy Truck Traffic	
25 mm (1 in.) bituminous surface 4 lifts @ 75 mm (3 in.) bituminous base 150 mm (6 in.) compacted aggregate (adequately drained)	225 mm (9 in.) reinforced concrete 150 mm (6 in.) compacted aggregate (adequately drained)

TABLE 21.7: COMMERCIAL MAJOR & MINOR APPROACH CROSSOVER

Pavement Alternative	Minimum Requirements
Bituminous	25 mm (1 in.) bituminous surface 225 mm (9 in.) bituminous base (3 lifts) 150 mm (6 in.) compacted aggregate
Concrete	225 mm (9 in.) reinforced concrete 150 mm (6 in.) compacted aggregate

TABLE 21.8: COMMERCIAL SUB-MINOR & PRIVATE APPROACH CROSSOVER

Pavement Alternative	Minimum Requirements
Bituminous	25 mm (1 in.) bituminous surface 150 mm (6 in.) bituminous base 150 mm (6 in.) compacted aggregate
Concrete	150 mm (6 in.) reinforced concrete 150 mm (6in.) compacted aggregate

NOTE: Concrete pavement may be reinforced with wire mesh, steel rods, or fiber additives.

SECTION 24: DRAINAGE

The applicant shall provide drainage information, including development site plans and drainage calculations showing existing and proposed drainage patterns (including existing contours), to the Department with proof that there are no adverse affects to drainage patterns in the vicinity caused by the development. Any diversion of water flow to the right-of-way shall be fully identified and explained. There shall not be any increase to flows unless the development drains to an adjacent stream of adequate capacity to convey the augmented and future development drainage.

If downstream drainage capacity is inadequate, the applicant shall provide flow detention on the developed property. Absolutely no detention is allowed on INDOT right-of-way. Detention structures and means of discharge shall be adequately presented and explained on plans and in calculations provided to the department. INDOT strongly discourages the use of orifice plates for the control structures. The preferred method is to install a section of pipe of the appropriate size to restrict the flow.

The 50 year developed property run-off-rate shall not exceed the 10 year undeveloped property run-off-rate. Thus, the entire Q_{50} run-off shall be detained on the property and released at the 10 year undeveloped property run-off rate. This criteria shall be followed unless a local agency has a more restrictive ordinance. The rational method for detention design may be used for developments that are 0.81 Hectares (2 Acres) or less in total size. Detention analysis for developments larger than 0.81 Hectares (2 Acres) shall be performed using a method that generates hydrographs for both the inflow and the outflow.

The minimum size opening for all drainage structures crossing under interstate routes and state routes with more than two lanes shall be 910 mm (36 inches) in diameter for round pipes or 0.7 m^2 (7.4 square feet) for deformed pipes. The minimum size opening for all drainage structures crossing under 2-lane routes shall be 380 mm (15 inches) in diameter for round pipes or 0.15 m^2 (1.6 square feet) for deformed pipes. The minimum pipe sizes under driveway approaches shall be 380 mm (15 inches) in diameter for round pipes or 0.15 m^2 (1.6 square feet) for deformed pipes. All pipes with diameters from 380 mm (15 inches) to 910 mm (36 inches) shall have pipe end sections; pipes with diameters of 1060 mm (42 inches) and greater shall have concrete anchors. See Metric Standard Sheets 715.

The Department uses the following design frequencies for any type of drainage structures on a highway

Interstate Routes	100 year
Primary Routes	100 year
Secondary Routes	100 year
Driveways	10 year
Side Ditches	10 year

The “Hydraulic Guidelines” and the drainage chapter of the Department’s “Road Design Manual” contain considerable information about design criteria for drainage structures. They are suitable references for the applicant whose development has a major impact on highway drainage facilities. Copies of both manuals may be obtained by contacting the Indiana Department of Transportation.

Adjustments to existing highway storm sewer structures may be necessary, such as relocation of an inlet displaced by the driveway approach. The relocated structure shall be compatible with those servicing the segment of highway. The Metric Standards Sheets 720 (English Standard Sheets MD) contain the design of drainage structures commonly used along highways.

Pipes shall not be smaller than structures upstream from their location.

SECTION 25: CURBS

Approaches located along a curbed highway shall also be suitably curbed. There are alternative types of curbs and the applicant shall match the predominate curb design that exists along the highway. The curb treatment at the approach should be compatible with that used at other approaches in the vicinity. If there is no other existing curb in the area, the proposed curb should be placed 0.6 m (2 feet) from the edge of pavement.

Various types of curbs in use along highways are illustrated on Metric Standard Sheets 605 (English Standard Sheets ME). It is recognized that conditions may require dimensions different from those shown on that sheet and that engineering judgment will be used to satisfactorily reconcile differences.

There are various treatments of curbs at approaches that may be acceptable. Sidewalks shall be included in the approach design as needed and shall have a means of accommodating handicapped persons. Refer Metric Standards Sheets 604 (English Standard Sheets MA1 and MA1A).

SECTION 27 : MEDIAN CROSSOVERS

High volume traffic generators such as shopping centers, industrial plants, industrial parks, residential projects, and similar developments may have a median crossover desirable. It will be the burden of the applicant to prove that a crossover would be to the best interest for the motoring public and at the safest location possible. A crossover should not be considered unless it meets the following minimum requirements:

1. It is located more than 120 m (400 feet) from an existing crossover and can be proven that its construction would improve the safety characteristics of the road for the motoring public.
2. It upgrades an existing unimproved crossover.
3. It relocates an existing crossover and still maintains the minimum 120 m (400 feet) clear distance to the next crossover.
4. There is sufficient room for standard turning lanes and recovery tapers and it will function properly. It should be noted that a crossover is not a property right and can be removed at any time if the Department considers it a safety hazard.

There are a variety of crossovers and the design criteria used is dependent on existing condition factors and the types of usage anticipated. For selecting a suitable design for a crossover the existing conditions, such as highway median width, approach pavement section, crown characteristics of highway pavement, presence of median left turn lanes, etc. must be considered.

The usage will relate to the to the type of approach it serves. Crossovers are divided into two groups:

- A) Commercial Major & Minor Driveway Approach Crossover**
- B) Commercial Sub-Minor & Private Driveway Approach Crossover**

If an approach serves both a commercial driveway and a private driveway, it shall be constructed under the design criteria pertaining to commercial driveway approach crossovers.

The separate design criteria for both types of approach crossovers is contained herein.

A. COMMERCIAL MAJOR & MINOR DRIVEWAY APPROACH CROSSOVER :

The following criteria shall apply to a crossover serving a major or minor commercial driveway approach.

A.1) Centerline Alignment : The crossover centerline shall be aligned 90 degrees to tangent on the highway centerline at the point the approach centerline intersects the highway centerline. It is located midway between the noses of the median.

A.2) Width of Median Opening : The width of a median opening should properly accommodate the turning path of the design vehicle. In general, the width of opening will be determined by the design of the major highway and the available right-of-way. The minimum median opening width is 12 m (40 feet); however, each median opening should be evaluated individually to determine the proper width of opening. Opening widths are given in table 27.1.

TABLE 27.1: OPENING WIDTH FOR COMMERCIAL MAJOR & MINOR APPROACH CROSSOVER

Left Turn Lanes	Median Width		Minimum Width of Median Opening	
	meters	feet	meters	feet
None	1 - 6	4 - 20	23	75
	6 - 8	20 - 25	20	60
	8 - 9	25 - 30	18	50
	9 - 14	30 - 45	18	45
	14 - 20*	45 - 64*	15	40
One	5 - 6	16 - 20	23	75
	6 - 8	20 - 25	18	60
	8 - 9	25 - 30	15	50
	9 - 11	30 - 35	21	55
	11 - 14	35 - 45	20	45
Two	14 - 20*	45 - 64*	17	40
	5 - 12	16 - 40	23	75
	12 - 14	40 - 45	18	60
	14 - 20*	45 - 64*	17	55

* Any crossover constructed in a median wider than 20 m (64 feet) shall be treated as a road with two approaches at the highway median edges of pavement.

A.6) Pavement: The crossover shall be surfaced between the highway edges of pavement. The crossover pavement shall generally be the same material type and design strength as the adjacent mainline. A crossover serving both a concrete approach and a bituminous approach may be constructed with either pavement material. Acceptable pavement design is given in Section 21 (table 21.7).

A.7) Drainage: The existing drainage patterns in the vicinity of the crossover shall be perpetuated. No ponding in the median or on any pavement areas will be allowed and all surface water shall be properly drained.

A crossover constructed within a median having a graded ditch parallel to the highway centerline shall have a properly sized pipe placed in the flow line of the ditch. The minimum size pipe under the crossover shall be 380 mm (15 inches) in diameter for a round pipe or 0.15 m² (1.6 square feet) for a deformed pipe. The ends of the pipe shall have pipe end sections installed (as shown on Standard Detour Sheet1A).

A.8) Shoulder Treatment and Curbs: A crossover located along a highway having a flush shoulder shall receive the same treatment along the crossover edges of the pavement as that existing along the highway median edges. Likewise, a crossover located along a curbed highway shall also be curbed in the same manner. Appropriate measures shall be taken to see that water run-off on the crossover pavement surface does not pond.

B. COMMERCIAL SUB-MINOR AND PRIVATE DRIVEWAY APPROACH CROSSOVER :

The following criteria shall apply to a crossover serving a commercial sub-minor or a private driveway approach:

B.1) Centerline Alignment: Requirements shall be same as for commercial driveway approach crossover.

B.2) Opening Width: Widths of opening are given in Table 27.3.

TABLE 27.3: OPENING WIDTHS FOR COMMERCIAL SUB-MINOR & PRIVATE APPROACH CROSSOVER

Median Width		Minimum Width of Median Opening			
		Single Approach		Joint Approach	
meters	feet	meters	feet	meters	feet
1.0 - 4.5	4 - 15	6	20	12	40
4.5 - 9.0	15 - 30	4.5	15	9	30
8.0 - 9.0	25 - 30	4	12	6	20

Any crossover constructed in a median wider than 20 m (64 feet) shall be treated as a road with two approaches at the highway median edges of pavement.

B.3) Median End Treatment: Requirements shall be same as for commercial driveway approach crossover.

B.4) Radii and Tapers: The crossover edges of pavement shall be connected to the highway traveled ways with returns of adequate radii.

For medians whose widths (M) is less than 10 m (30 feet). The nose radius (R) will be:

$$R=M/2.$$

For median width greater than 10 m (30 feet), the minimum nose radius shall be 4.5 m (15 feet) and the maximum of 10 m (30 feet), however, the recommended nose radius is 6 m (20 feet). It may include a tangent road segment whose width is equal to the width of the driveway approach.

B.5) Grade: Requirements shall be same as for commercial driveway approach crossover.

B.6) Pavement: The crossover shall be surfaced between the highway edges of pavement. The crossover pavement shall generally be the same material type and design strength as the adjacent mainline. A crossover serving both a concrete approach and a bituminous approach may be constructed with either pavement material. Acceptable pavement sections are given in Section 21 (table 21.8).

B.7) Drainage: Requirements shall be same as for commercial driveway approach crossover.

B.8) Shoulder Treatment and Curbs: Requirements shall be same as for commercial driveway approach crossover.

SECTION 28 : MAILBOX TURNOUTS

Mailbox turnouts should be provided in the driveway approach permit applications. As practical, mailboxes should be grouped and turnouts combined with the driveway approach pavement. The mailboxes should be placed 0.6 m (2 feet) center-to-center, and the turnout lengthened to accommodate the grouping.

Mailbox supports shall not be larger than a 100 mm (4 in.) square timber post, a 60 mm (2.5 in.) standard wall pipe, or a section having similar breakaway characteristics. Where a guardrail exists, the support shall be placed behind the guardrail.

Acceptable mailbox turnout pavement design is given in Section 21 (table 21.4)

Acceptable geometric designs for mailbox turnouts are shown in Figures 28.1 and 28.2.

SECTION 30 : PARKING

It is necessary and important that each roadside business establishment provide sufficient parking or storage space to prevent the storing or backing-up of vehicles on the highway right-of-way. Such parking and storage space is particularly needed for businesses such as restaurants, drive-in theaters, truck terminals, drive-in banking, etc., where a number of vehicles enter and leave the area at one time. When the parking and storage area is inadequate or buildings or other installations do not conform to the setback dimensions set forth in these regulations, the driveway or driveways shall be located and constructed so as to prevent as much as possible the storage or backing-up of vehicles on the highway right-of-way.

Where there are one or more driveways to a business establishment located on the corner of an intersection, parking shall be prohibited along each roadway abutting the business establishment for 10 m (30 feet) from the frontage boundary line at the intersection or between the intersection and the nearest driveway, whichever is the lesser distance.

SECTION 31 : DRAWINGS AND INFORMATION REQUIRED FOR COMMERCIAL MAJOR & MINOR DRIVEWAY APPLICATIONS

The permit application should be accompanied by four (4) sets of clear drawings, no larger than 600 mm X 900 mm (24" X 36") in size, prepared by a registered professional engineer, a registered architect, and/or registered land surveyor showing the following information in detail:

1. Driveways and approaches including dimensions for width, length, angle of intersection radii, and any other measurements necessary to show the geometrics of driveway and approaches drawn to an engineers 1:200 or 1:500 scale (20 or 30 English scale).
2. A rate of slope or grade of pavement for approaches & driveways, and typical cross sections.
3. Type of approach and driveway pavement material (stone, concrete or bituminous pavement including depth of lifts).
4. Existing drainage patterns (including existing contours) and structures, including size and kind.
5. New drainage patterns including the effect on downstream department facilities and private property, and structures including size, kind, invert pipe elevations, and inlet elevations.
6. A separate pavement marking plan showing all existing and proposed pavement markings with details of type, material, color, etc.
7. Width dimensions of highway right-of-way.
8. Width and type of highway pavement.
9. Highway right-of-way and property lines.
10. Development site plan showing parking, interior drives buildings, and other improvements, including distance from right-of-way line to gasoline pumps.
11. The distance to and the design of all drives, intersecting roads, streets, railways, or crossovers within 150 m (500 feet) in each direction on both sides of the highway from the applicant's property lines drawn to engineer's 1:500 scale (50).
12. The posted speed limit on highway and all traffic control equipment serving the highway, including but not limited to signalization devices, lighting, pavement markings, guardrail, and sign structures.
13. Proposed treatment of right-of-way area adjacent to and between approaches.
14. Appropriate symbols such as north arrow, direction of lane travel and direction of drainage flow, and a legend defining abbreviations and graphic representations of existing and new conditions, objects, materials, etc.
15. A legal description of the property to be served by the permit together with a legal description of the adjoining land owned or controlled by the applicant.
16. Traffic control needed during work activity displaying necessary signs, barricades, detour signs, and warning devices shall be provided whenever work is to interfere with normal traffic. Traffic control must be in accordance with the Construction and Maintenance Section of the Indiana Manual on Uniform Traffic Control Devices.

Failure to provide appropriate information will result in delays in processing and possible overdesign due to wrong assumptions.

SECTION 32 : TRAFFIC IMPACT ANALYSIS

Traffic Impact Analysis (TIA) is a specialized study of the impact that a given type and size of new land use has on the nearby transportation system.

Development having land use intensity greater than the threshold values given in table 32.1 will be required to prepare a traffic impact analysis.

TABLE 32.1 : THRESHOLD VALUES FOR TRAFFIC IMPACT ANALYSIS

LAND USE TYPE	THRESHOLD VALUES	
Residential	150 Dwelling Units	150 Dwelling Units
Retail	1400 m ²	15000 Sq. Feet
Office	3250 m ²	35000 Sq. Feet or 3 Acres
Industrial	6500 m ²	70000 Sq. Feet or 9 Acres
Educational	2800 m ² or 250 Students	30000 Sq. Feet or 250 Students
Lodging	120 Occupied Rooms	120 Occupied Rooms
Medical	4275 m ²	46000 Sq. Feet

For developments which can not be grouped under the categories mentioned in table 32.1, the requirement of traffic impact study will be decided by the District Permit Section on the basis of engineering judgment.

For details, the Traffic Impact Study Guidelines should be used.

SECTION 33 : ACCESS SIGNALIZATION

There may be an immediate or future need for a traffic signal at the access point for high volume traffic generators such as shopping centers, industrial plants, industrial parks, residential projects, and similar developments.

When there is a future need for a traffic signal as determined by the INDOT, the applicant will be required to sign a FUTURE-TRAFFIC SIGNAL COVENANT.

If and when traffic generation at and by the development site meets minimum warrants for a traffic signal installation as determined by INDOT, a SEPARATE AGREEMENT shall be prepared by INDOT to be entered into by the applicant which will give property owner the permission for such installation.

Any present or future installation of a traffic signal will be the responsibility of the applicant or subsequent property owner(s).

The failure to sign the above mentioned agreement(s) may result in the denial of the permit application.

SECTION 34 : AGREEMENT TO EXECUTE AN ACCESS CONTROL DOCUMENT

Limiting access to public road right-of-way is a design feature. The intent is to reduce the total area of conflict (traffic movements egressing and ingressing roadside establishments are at variance with through highway traffic movements) by controlling and defining driveway openings. The frequency of conflicts is reduced because the number of possible conflict points is limited to legal, defined driveway openings. This enhances both the safety and capacity of the highway as preference is given to the through traffic. Points of congestion, such as major intersections or interchanges, can be kept clear and free of additional traffic introduced by driveways close to the intersection or interchange. Driveways for major development sites, which may eventually become signalized, can be better situated with respect to traffic signal coordination. The extent and effectiveness of access control will be reflective of whether the highway section in question is in a rural, suburban, or urban environment.

In consideration for INDOT granting driveway permit(s), the applicant may be required to sign an agreement to execute an access control document conveying the access rights for the balance property frontage owned by the applicant. This document will be recorded.

SECTION 35 : PERFORMANCE BOND

A performance bond shall be required with each application for a commercial driveway to equal the estimated cost of that part of the project on the department's right-of-way, the minimum amount of bond shall be \$5000 (five thousand dollars) or amount as specifically set by appropriate department action.

A bond in an appropriate amount may also be required on non-commercial drives.

Following are the categories for which the bond may be waived:

GOVERNMENTAL AGENCIES: Agencies of political subdivisions (Federal, State, County, City or Town) reporting to elected official.

CHURCHES: Community of religious peoples professing the same faith and observing the same ritual and ceremonies.

SCHOOLS: Private and public institutions providing first grade or higher education.

RAILROAD COMPANIES: Companies regulated by the Indiana Public Service Commission while performing normal maintenance or construction activities, to railroad facilities.

CLOSING EXISTING DRIVEWAYS: Any applicant whose approved permit will result in work solely for the purpose of closing existing driveway approach(es) to the state highway system from the property.

These exemptions are not to be based upon the tax exempt or non-profit status of the applicant. A person or committee of persons elected by a group of people does not necessarily qualify as a governmental agency.

The applicants who are claiming an exemption shall complete the Bond Waiver form (SF 35483).

APPENDIX : DRIVEWAY PROMULGATED RULES

INDIANA ADMINISTRATIVE CODE (IAC)

TITLE 105

ARTICLE 7: PERMITS FOR HIGHWAYS

Rule 1 : Driveway access: Applications, Standards, Designs

SECTION 1 : Purpose of rule

The Indiana Department of highways is authorized to determine and establish such requirements and restrictions for driveway approaches as may be necessary to provide for the drainage of the highway, preservation of the highway and the safety and convenience of traffic on the highway. A written permit application shall be considered by the department and, if in accordance with properly established regulations and requirements, a permit shall be granted subject to appropriate conditions and provisions contained therein. All work on the permit shall be performed to the satisfaction of the department.

SECTION 2 : Definitions

"Access" means a location which allows vehicular and/or pedestrian traffic to cross the highway right-of-way line and is positioned at the connection of a driveway with the approach at the right-of-way line.

"Applicant" means a person, partnership, company, corporation, association, or agency making application for a permit to perform work on an approach.

"Application" means a formally prepared request for a permit which is presented by an applicant on a permit form to the department seeking permission to perform work on highway right-of-way.

"Approach" means a way or place improved for vehicular or pedestrian traffic on the highway right-of-way, which joins the pavement edge of the highway with a driveway or pedestrian walkway.

"Auxiliary lane" means a portion of the roadway adjoining the traveled way for parking, speed change, turning, storage for turning, weaving, truck climbing or for other purposes.

"Commercial approach" means an approach, which joins the highway with a driveway to private property used for commercial purposes and to public property.

“Crossover” means a paved or graded crossing in the highway median which allows vehicles to cross or to turn across the highway.

"Department" means the Indiana department of highways acting directly or through its duly authorized officers and agents.

"Driveway” means a way or place not on the department right-of-way which is used for vehicles.

"Expiration date" means the last calendar day that the valid permit is in effect and that the approach must be in compliance with all conditions of the permit.

"Field approach" means an approach which joins the highway with a driveway to private property that is vacant, in an unimproved condition, or a farm field.

"Highway" means any roadway under the jurisdiction of the department that is designated as a state route, a US route or an interstate.

"Issue date” means a calendar day that the permit is granted to the applicant.

"Limited access facility" means a highway especially designed for through traffic and over, from, or to which owners or occupants of abutting land or other persons have no right or easement or only a limited right or easement of direct access, light, air, or view by reason of fact that their property abuts such limited access facility or for any other reason.

"Median" means the portion of a divided highway separating the traveled way for traffic proceeding the opposite direction.

"Notice" means a certified letter from the department addressed to the owner(s) of the real estate stating that the approach(es) for a driveway(s) emanating from the real estate is unauthorized and providing the approximate location of the approach(es), a statement of any substandard elements of the approach(es), the action to be taken by the owner and the deadline for completing the prescribed action.

"Permit" means a legal document in which the department gives written permission to an applicant to perform work on the highway right-of-way.

"Permittee” means the applicant following the issuance of a permit by the department.

"Private approach" means an approach, which joins the highway with a driveway to private property having a residence, barn, private garage or other improvements and is ordinarily used only by the owner or occupant of the premises, guests and necessary service vehicles.

"Purchased limited access" means rights-of-way along any highway designed by the department to be limited access facility and whose access rights have been acquired by the department.

"Right-of-way" means all land under the jurisdiction of and whose use is controlled by the department.

"Shoulder" means that portion of the highway right-of-way contiguous with the traveled way for accommodation of stopped vehicles, for emergency use, and for lateral support of roadway base and surface courses. It is measured from the edge of pavement for traveled way or, if present, auxiliary lane to the intersection of the shoulder and fill or ditch slopes.

"Title evidence" means documentation in the form of a certified search covering a period of twenty (20) years, current title insurance or certified letter from abstractor or title insurance agent certifying fee simple ownership of the property.

"Traffic" means pedestrians, ridden or herded animals, vehicles, and other conveyances either singly or together while using any highway for purposes of travel.

"Traffic control" means devices such as signs, barricades, pavement markings and signalization used to direct traffic in safe orderly use of the highway.

"Traveled way" means the portion of roadway used for the movement of traffic, excluding shoulders and auxiliary lanes.

"Unauthorized approach" means an approach which has been constructed, reconstructed, altered or modified; which remains incomplete, or has become substandard for any reason, such as change in land use; that is not approved nor authorized to exist in its present condition, under present traffic pattern, by the department.

SECTION 3 : Classification of entrances and approaches

All approaches shall be divided into five (5) classes as follows:

CLASS I - Private Approach - Raised curb used.

CLASS II - Private Approach - Flush shoulder only, no raised curb.

CLASS III - Commercial Approach - Raised curb used.

CLASS IV - Commercial Approach - Flush shoulder only, no raised curb.

CLASS V - Field Approach - Either raised curb or flush shoulder.

SECTION 4 : Types of permits: limited access, commercial and private driveways

The driveway approach applications shall be designated and defined as being one of the following types of permits:

Limited access driveway - Any change to an existing access, approach, and/or crossover or the construction of a new access, approach and/or crossover along a purchased or declared limited access highway.

Commercial major driveway - Any change to an existing access, approach and/or crossover or the construction of a new access, approach and/or crossover which connects the highway to private property used for commercial purposes or to a public property and which attracts enough traffic to require auxiliary lanes as determined by the department.

Commercial minor driveway - Any change to an existing access, approach and/or crossover or the construction of a new access, approach and/or crossover which connects the highway to private property used for commercial purposes or to a public property and which does not attract enough traffic to require auxiliary lanes as determined by the department.

Private driveway - Any change to an existing access, approach and/or crossover or the construction of a new access, approach and/or crossover that connects the highway to private property having a residence, barn, private garage, an improved or unimproved condition and ordinarily used only by the owner or occupant of the premises, guests and necessary service vehicles.

SECTION 5 : Application for permit; form; fees

Application to the department for a permit to construct any approach connecting a driveway with any department highway or highway right-of-way, to cut any curb along a highway or construct a crossover on a highway shall be made on the form as prescribed by the department. The form and accompanying documentation shall be submitted containing as many copies as may be prescribed by the department. Reasonable fees for processing driveway permits may be established by appropriate department action.

SECTION 6 : New application; when required

Relocation, alteration, or remodeling of an access, approach and/or crossover, or any change in the character of the use of the access, approach and/or crossover shall be considered the construction a new access, approach or crossover and an application for a permit shall be required. The granting or denial of such application shall be governed by the same regulations and judged by the same standards as an application for a permit for a wholly new access, approach and/or crossover.

The application shall include immediately proposed and future work affecting all locations of access to the applicant's property and adjacent parcels in which the applicant holds an interest.

SECTION 7 : Parties to application; evidence of title

All applications for permits under 120 IAC 2-1 (this rule) shall be made in the name of the owner of the fee simple title. All persons having any interest in the land, including but not limited to mortgagees, lessees, optionors, lien holders, and holders of other encumbrances shall join with the fee simple holder in the application. All such persons shall join in the application, shall sign and consent to the conditions of the application, and shall be bound equally thereafter by the conditions of the permit which may be issued to the permittee.

Title evidence, shall be furnished to support the signatures for driveway permit applications in the following areas:

- (A) All commercial driveway permit applications except those applications involving an existing access with no proposed change in access, use, or character.
- (B) Private driveway permit applications including field access approaches in areas along highways covered by limited access resolutions or on sections of state routes in the biennial highway improvement program.

All other allowable evidence will be at the discretion of the department.

If the applicant submits an application in which the title evidence does not include the signatures of all interest holders and if the application is evaluated in favor of granting the permit, the applicant must submit subsequent title evidence showing that all omitted interest holders have ceased to be interest holders or have by an addendum to the application joined the original applicant on the original application, and such subsequent title evidence or addendum must be submitted before the permit is issued.

SECTION 8 : Statement of purpose and adjacent parcels

All applications for permits shall disclose the present and proposed use of the parcel for which access is requested. Any intended use of the access in conjunction with any adjacent parcel, whether owned by applicants or by others, or to be purchased or sold by the applicant, or others, shall be disclosed in the application. All adjacent parcels owned or controlled by the applicants, whether intended to be used in conjunction with the requested access or not shall be disclosed in the application. These disclosures are required to ensure the public a safe and convenient means of travel consistent with the right of the adjoining landowner to have access as provided by law.

SECTION 9 : Drawings and information required

All applications for permits under these regulations shall be accompanied by clear drawings. One (1) set of drawings shall accompany all copies of the application form. Information to be shown on drawings shall include the following as applicable:

- (1)** Driveway(s) and approach(es) including dimensions for width, length, angle of intersection, radii, and any other measurement necessary to show the geometrics of the driveway(s) and approach(es) drawn to an engineers 20 or 30 scale.
- (2)** Rate of slope or grade of pavement for approach(es) and driveway(s).
- (3)** Type of approach and driveway pavement material (stone, concrete, or bituminous pavement including depths of lifts).
- (4)** Existing drainage patterns and structures, including size and kind.
- (5)** New drainage patterns, including the effect on downstream department facilities and private property, and structures including size, kind, invert pipe elevations, and inlet elevations.
- (6)** Width dimension of highway right-of-way.
- (7)** Width and type of highway pavement.
- (8)** Highway right-of-way and applicants property lines.
- (9)** Development site plan showing parking, interior drives, buildings, and other improvements, including distance from right-of-way line to gasoline pumps.
- (10)** Distance to intersecting roads, streets, railways, or crossovers within five hundred (500) feet in each direction on both sides of highway from the applicants property lines drawn to an engineers 50 scale.
- (11)** The distance to and the design of all drives on both sides of highways and in each direction that are within five hundred (500) feet of applicants property lines drawn to an engineers 50 scale.
- (12)** The posted speed limit on highway and all traffic control equipment serving the highway, including but not limited to signalization devices, lighting, pavement markings, guardrails, and sign structures.
- (13)** Proposed treatment of right-of-way area adjacent to and between approaches.
- (14)** Appropriate symbols such as north arrow, direction of lane travel and direction of drainage flow, and a legend defining abbreviations and graphic representations of existing and new conditions, objects, materials, etc.
- (15)** A legal description of the property to be served by the permit together with a legal description of the adjoining land owned or controlled by the applicant.
- (16)** Traffic control needed during work activity displaying necessary signs, barricades, detour signs, and warning devices shall be provided whenever work is to interfere with normal traffic. Traffic control must be in accordance with the Construction and Maintenance Section of the Indiana Manual of Uniform Traffic Control Devices.

SECTION 10 : Construction and materials standards

All construction and materials used within the highway right-of-way must conform to the current Indiana state highway "standard specifications" which shall be kept on file at the

offices of the department.

SECTION : 11 Standards and design requirements

All applications shall be filed in accordance with the standards and design requirements of the department. The permittee shall agree to perform all work on the right-of-way in accordance with such standards and design requirements of the department.

SECTION 12 : Commercial applications; attestation

All applications for commercial purposes shall be signed by a registered professional engineer, a registered architect, and/or registered land surveyor, attesting that the applications as proposed, conform with all department regulations, specifications and standards, except as shall be noted in such attestation.

SECTION 13 : Land use and zoning approval

Approval of a permit application shall be subject to the permittee obtaining all necessary approvals involving land use from the zoning board plan commission, and/or local governmental authorities, and shall comply with all applicable laws. The issuance of any permit shall in no way imply department approval of, or be intended to influence any action pending before any local board, commission or agency.

SECTION 14 : Performance bonds

The department shall require a performance bond to be filed with each application for a commercial driveway showing the applicant as principal in a minimum amount of five thousand (\$5,000) dollars or in an amount as specifically set by appropriate department action. Such amount shall be increased in any application to equal the estimated cost of that part of the project on the department's right-of-way. The department may also require an adequate bond to be filed in any non-commercial application. Such bonds are required to insure compliance with all terms of the permit and shall in case of noncompliance, provide in addition to any damages suffered thereby, all witness and court costs in collecting the same, together with any attorney's fee reasonably due, and shall be released only when the work described on the permit has been completed to the satisfaction of the department.

SECTION 15 : Crossovers

Permits for private or commercial crossovers will not be approved unless the applicant can prove to the satisfaction of the department that the location of the crossover will not be detrimental to the safety of the traveling public. The minimum recommended distance between crossovers is four hundred (400) feet.

SECTION 16 : Adjacent tapers

Where the taper of a proposed driveway will create hazardous and erratic traffic movement because of its proximity to adjacent similar taper, the entire area between said tapers must be paved thus forming a continuous full lane between the approaches of which said tapers are a part.

SECTION 17 : Sight distances

All approaches shall be located so as to provide adequate sight distance in both directions along the highway for safe access to the highway without interfering with traffic. Under substandard visibility conditions as determined and set by the department, access may be granted for an alternate location that offers the least hazard and interference with traffic.

SECTION 18 : Interference with traffic control devices

No entrance or approach shall be located or constructed so as to interfere with or prevent the proper location of necessary highway signs or other traffic control devices.

SECTION 19 : Drainage requirements

All improvements authorized by the permit shall not interfere with drainage of the street or highway, nor cause additional area to drain onto the right-of-way unless specifically acknowledged and allowed by the permit, nor shall such improvements be constructed so as to cause drainage onto the roadway.

SECTION 20 : Authorization to proceed; objections

Upon receipt of a permit issued by the department, the permittee is authorized to proceed with the work covered by the permit, subject to the conditions imposed by the department.

In accordance with the notice requirements of IC 4-22-1-25, any objection to the conditions and provisions of an approved permit must be submitted in writing to the department within fifteen (15) days from the issue of the permit.

The permit does not apply to any highway right-of-way that is closed for construction purposes, except as allowed by the provision in the permit, nor to any county road or city streets.

SECTION 21 : Inspection; revocation of permit

An inspection may be conducted at any time by the department and a final inspection of the permit shall be conducted upon completion of construction. The work covered by the permit does not comply until found to be in accordance with the plans and

specifications filed in the application as amended by the department, together with any special conditions noted therein, and approved by the department. The permittee shall adjust or stop operations upon direction of any police officer or authorized department employee. The permit may be revoked at any time by the department for non-compliance with any and/or all provisions and conditions of said permit.

The permittee shall pay the department for any inspection costs including labor, vehicular mileage, and equipment expenses when it is necessary to assign a department employee to inspect the work. The permittee shall immediately reimburse the department upon receipt of an itemized statement.

SECTION 22 : Noncompliance of permits without bonds

On permits not covered by a bond, work performed that is incomplete improperly performed or otherwise does not follow the conditions or provisions of the permit shall be designated as “Does Not Comply”. The department shall follow procedures for corrective action, beginning with the notice action stated in 105 IAC 7-2-4(2). Permit applications for existing approaches that are denied by the department shall be corrected by entering the same procedure in 105 IAC 7-2-4 (2).

SECTION 23 : “Limitation of access” instrument

The permittee shall sign a copy of a “limitation of access” instrument, if so required by the department as a condition of the permit. The department shall immediately cause said limitation of access instrument to be recorded in the appropriate county.

SECTION 24 : Notice of start of construction

The permittee shall notify the department’s sub-district office five (5) working days prior to the start of any work activity on the highway right-of-way, of the date such work will commence. The permittee shall notify the department’s sub-district office prior to completion of all work on the highway right-of-way of the anticipated date such work will be completed.

SECTION 25 : Traffic control

The permittee shall erect and maintain all necessary traffic control signs, barricades, detour signs, and other traffic control devices required to safely direct traffic over or around the part of the highway where permitted operations are to be done in accordance with the construction and maintenance section of the Indiana Manual on Uniform Traffic Control Devices. Disruption to traffic shall be kept to a minimum and shall require approval of the department prior to beginning other work activities on the right-of-way.

SECTION 26 : Prohibited hours of work

The permitted work shall not be performed on the highway right-of-way between sunset and sunrise, unless specifically allowed by special provisions to the permit. The permitted work shall not be performed on the highway right-of-way during the period beginning at 12:00 noon on the last weekday preceding and continuing until sunrise on the following day; New Years Day, Memorial Day, Independence Day, Labor Day, Thanksgiving and Christmas.

SECTION 27 : Display of permit

The permittee shall have a permit complete with drawings and special provisions on the job site at all times and will show said permit, on demand, to any police officer or department employee.

SECTION 28 : Term of permit; extension; cancellation

All work on highway right-of-way authorized by a permit must be completed within one (1) year after the permit is issued; otherwise, the permit will be canceled unless an extension is requested, in writing, by the permittee, and is approved by the department. The time extension shall not exceed more than one (1) year beyond the original expiration date unless approved otherwise by the department. If a permit is canceled, a new application must be submitted and approved before the proposed work can begin. Once construction authorized by the permit is initiated it must be completed within thirty (30) days, unless otherwise expressly approved as a special condition.

SECTION 29 : Liability during construction

The permittee shall assume all responsibility (during the time from the beginning of the work covered by any permit until final approval for the work) and shall furthermore be obligated to save harmless the State for any and all injury, loss or damage occasioned to or by persons or property resulting directly or indirectly from such work; the department shall, in its discretion, require the permittee to provide liability and indemnity insurance for the use and benefit of the State of Indiana.

SECTION 30 : Interference with structures on right-of-way

The work authorized by the permit shall not interfere with any existing structure on any department right-of-way without specific permission in writing from the department or other owner thereof. Any structure or traffic control device affected by the proposed construction shall be relocated at the permittee's expense as directed. In the event that any buildings, railings, traffic control devices, or other structures are damaged, said cost of the removal and/or of repair due to damage shall be at the permittee's expense as directed.

SECTION 31 : Encroachment by advertising signs

The permittee shall not erect or maintain any advertising sign on or over the right-of-way or any portion thereof in violation of any law.

SECTION 32 : Change in existing access; subject to new rules

Any person, who by law, has an existing legal right of access to a state highway shall as a condition of the issuance of any permit and in consideration of the same, agree that such rights of access, then existing or granted thereafter with respect to such real estate are subject to 120 IAC 2-1 [this rule] as the same may from time to time be amended by the department.

SECTION 33: Severability of rule

If any provision of 120 IAC 2-1 [this rule] or the application thereof to any person or circumstances is invalid, such invalidity shall not affect the other provisions or usage of 120 IAC 2-1 [this rule], which can be given effect without the invalid provision or usage, and to this end, the provisions of 120 IAC 2-1 [this rule] are declared to be severable.

Rule 2 - Unauthorized Approaches to Driveways

SECTION 1 : Purpose of rule

The Indiana Department of Highways shall control access and regulate work performed on approaches to driveways on highway right-of-way. This control and regulation shall provide for the preservation of the highway, and the safety and convenience of traffic on highway. The measure of public benefit shall be the guide in determining the priorities and procedures in correcting any unauthorized approaches to driveways.

SECTION 2 : Documentation of approaches; corrective action required

The department shall control access along highways through inspection and by properly documenting planned and existing approaches for driveways and pedestrian walkways. Any construction, reconstruction, alteration, or modification to an approach by person(s) other than the department shall be administered through 120 IAC 2 [this article], Permits. Existing approaches, which may be in either a complete or incomplete condition and that have not been reviewed and authorized by the department, shall be considered unauthorized, undocumented and subject to corrective action. Existing approaches which were originally authorized by the department but which have become substandard for any reason, such as a change in land use that adversely affects traffic patterns, shall also be considered unauthorized, undocumented and subject to corrective action.

The permit process shall be the normal means of taking corrective action. The property owner(s) and/or the person(s) responsible for unauthorized approach shall make application for a written permit. All remedies available through the permit process shall be used to obtain full compliance of work on the approach.

Under circumstances where the department is unable to obtain the cooperation of the property owner(s) and/or the person(s) responsible for an unauthorized approach through the permit process, corrective action will be taken in accordance with procedures contained in 120 IAC 2-2 [this rule].

SECTION 3 : Priority of corrective actions

The department shall assign unauthorized approach work to its staff in accordance with manpower availability and shall first undertake corrective action for the more serious situations as determined by the department.

SECTION 4 : Procedures for corrective action

Connective action will normally be the construction, reconstruction, alteration or modification of the approach to standards acceptable to the department, or the complete removal of the approach and restoration of the highway right-of-way. The decision concerning the choice of a remedy remains with the department. The

following procedure will be used by the department to obtain a suitable corrective result.

- 1) The department will contact the responsible person(s) for the unauthorized approach, including the owner of real estate, and advise them they are to begin corrective action by preparing and submitting a permit application. The department shall state a specific date for receipt of the application, but in no case shall the time to submit the application be less than fifteen (15) calendar days from the date of contact. If an application is received within the specified time period, the department shall proceed to the requirements in 105 IAC 7-1.
- 2) If the person(s) responsible for the unauthorized approach has not responded within the specified time and if the application for the permit was not received by the department, a notice shall be given to the owner(s) of the real estate from which the unauthorized approach emanates by certified mail and shall be sent to the owner's last known address. A copy of the notice shall be sent to the occupant of the real estate and a copy of the notice shall be posted upon said real estate in a conspicuous place. The notice shall specify the time within which the owner(s) of the real estate shall have completed corrective action for the unauthorized approach, but in no case shall the period of time specified be less than thirty (30) calendar days.
- 3) If the owner of the real estate has not completed corrective action on the unauthorized approach within the time specified by the notice, the department may do whatever in its discretion is necessary to correct the situation or may cause the same to be done by other persons, parties, or corporation.
- 4) The cost of the corrective action to the unauthorized approach as provided by subdivision (30) in this section will be borne by the owner of the real estate. After the department has completed the corrective action, it shall bill the owner of the real estate for the cost.

SECTION 5 : Civil prosecution

It shall be at the discretion of the department to pursue legal action against the person who fails to react to the requirements of 120 IAC 2-2-4 (1) and (2) [section 4(1) through 4(2)] of this rule.

SECTION 6 : Waiver of corrective action

Where unauthorized approaches extending over any highway right-of-way are in place on the effective date of this regulation, it shall be the right of the department to exercise discretion in implementing the procedure stated in 120 IAC 2-2-4 [section 4 of this rule].

APPENDIX II: REFERENCES

1. Indiana Department of Transportation Design Manual - Road Design Part V Volume I
2. AASHTO 1994- A Policy on Geometric Design of Highways and Streets
3. Highway Capacity Manual- Special Report 209
4. Indiana Dept of Transportation – Standard Drawings
5. Indiana Dept of Transportation – Traffic Impact Study Guidelines
6. Access Management, Location and Design- Publication # FHWA-HI-92-033
7. Transportation Research Board/National research Council Circular # 456, March 1996- Driveway and Street Intersection Spacing
8. The Colorado Highway Commission - The State Highway Access Code
9. New Jersey Department of Transportation - Access and Spacing Standards for State Highways
10. Florida Department of Transportation – Rules of the Department of Transportation, Chapter 14-97 : State Highway Access Management Classification System and Standards
11. New Mexico State Highway and Transportation Department – Regulations for Driveways and Median Openings on Non-Controlled Highways
12. Wisconsin Department of Transportation – Planned Access : Protection for Wisconsin Highways