

## COMMERCIAL AND PRIVATE ENTRANCES

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There are many major problems facing highway departments today and one of the more acute ones is the control or lack of control of entrances—both private and commercial. This problem is common to all States; and, consequently, a lot of research has been done and many articles published on the subject. Material for this paper is from personal knowledge gained over a period of years while handling applications for permits for entrances; experience of the Traffic Division in attempting to control traffic and provide the highest possible degree of safety to the traveling public and from studies made in other States.

The enormous increase in traffic volumes on the highways since World War II has been paralleled by a similar increase in industrial, commercial and residential developments adjacent to these highways and each of these require entrances. All are traffic generators and each entrance can be a potential traffic hazard and each one reduces the capacity of the roadway and creates additional maintenance problems.

For the calendar year of 1951 there were 116 sections of highway in the State that had an excessive accident frequency rate. A section was considered to have an excessive frequency rate if this rate was above one; one representing the rate of the entire State road system.

Inspection was made by the Traffic Division on these road sections with the excessive accident rate. It was found that on 42 of the 116 sections, or 36%, the accidents were concentrated at locations where there was uncontrolled access to the highway. The following are excerpts from one of the inspection reports:

“The accidents on this section were concentrated at two locations. One of these locations was at the Club Shamrock where there were 9 accidents. There were no road deficiencies noted. The Club Shamrock has an entrance of over 400' in length and the entire area has been blacktopped so that cars can enter and leave the highway at will.”

“The accidents on this section of road were concentrated at three locations. One of these locations was at a drive-in theatre where there were seven accidents. Although 4 x 4 “THEATRE ENTRANCE” signs were up, the entrances were not properly constructed to control traffic. There is no storage space for cars waiting to enter the theatre and there were no defined entrances or exits. The cars entered and left the highway over a distance of 300 to 400 feet.”

These are typical examples of existing conditions on all major State roads.

In a recent study made by the Minnesota Highway Department in cooperation with the Bureau of Public Roads of “Accidents related to access points and advertisement signs” it was found that as the frequency of access points increased the accident rate was increased while the speed on the highway decreased.

°ACCIDENT RATES AND FREQUENCY OF ACCESS POINTS  
FOR TANGENT SECTIONS IN SPECIFIED SPEED GROUPS

Speed Group	Miles	Average Daily Traffic	Access Points Per Mile	Accident Rate
30 to 39 mph .....	10	2256	27.4	2.5
40 to 49 mph .....	49	2324	13.8	1.8
50 to 59 mph .....	284	2057	8.8	1.4

• From the Minnesota Highway Study Published in the Traffic Quarterly of January 1953.

Studies made by other States substantiate the evidence that uncontrolled access is definitely a hazard and menace to the through traffic on our highways.

The ideal solution, of course, to the problem is limited access highways; but since there are now less than ten miles of such highways in the State and the property owner cannot be denied access to public roads, it becomes imperative that the Highway Department have complete control over the location, design and construction of entrances in order to minimize traffic hazards and maintenance problems.

In Kentucky, property owners or their agents are required to submit application for entrances on standard forms to the District Engineers. For commercial entrances, the applications must be accompanied by a certified or cashiers check or bond to guarantee that construction is completed according to the specifications set out in the permit. District Engineers may approve applications for private entrances but applications for commercial entrances are submitted to the Director of Maintenance for approval.

To provide the best possible entrances that create the least traffic hazards and maintenance problems, it is highly important that each application be field inspected by qualified engineers before approval of the permit. Kentucky, like most states, has a set of minimum standards to aid the engineer in making his decisions for recommendations and provide some degree of uniformity so that applicants won't cry "discrimination".

In the State of Ohio the petroleum industry engineers worked in conjunction with Highway Department engineers for a year in developing standard designs of filling station entrances and both bodies approve the designs. Such cooperation is desirable, and I advocate it for Kentucky.

*Private Entrances:*

Some of you may think that private entrances are unimportant and that a County foreman or any individual can lay a pipe in the ditch, cover it, and then dump rock on the drive. I believe you will change your mind if you will try to recall the number of locations in the State where you have seen a sign reading, "HIDDEN DRIVE", or "CONCEALED ENTRANCE", or if you had to listen to complaints or answer letters saying, "you must slow down traffic in front of my house", "I can't get out of my drive", or "I take my life in my hands every time I drive onto the highway".

Recall the locations where you have seen stovepipe or crossies placed in the ditch or where the ditch has been filled up without pipe of any description; where right-of-way has been graded, destroying any vegetation and starting erosion where entrances slope up from the edge of the pavement and gravel or mud is always on the pavement; where entrances slope sharply down from narrow shoulders so that when you approach the highway in a car you are looking at the sky and it is impossible to see a car approaching; where 16 to 18 feet of

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pipe has been installed within 3' of the edge of the pavement, which makes it impossible for a passenger car to enter or leave the highway without crossing the centerline of the roadway.

In approving applications for private entrances the following specifications should be met:

1. Entrances should be constructed at selected locations that afford maximum sight distance.
2. They should be perpendicular or near perpendicular to the highway.
3. Entrance pipe should be installed to minimum standards as to elevation, size, length and locations, keeping in mind that a minimum length of 24' will meet standards only when it is installed at a minimum distance of 9' from the edge of the pavement. There is a tendency to install pipe in the existing ditch, but where this ditch is nearer than 9' from the edge of the pavement a new ditch should be cut or the pipe lengthened. The pipe should also be installed at a minimum depth below the shoulder so as to provide the necessary cover and so that ascending slopes may start at the shoulder instead of at the edge of the pavement.
4. In case of entrances on embankment sections, the grade should be carried level or on a very slight descending slope for a sufficient distance from the edge of the pavement to enable the type of vehicle which uses the entrance to be practically level before entering the highway.
5. In the case of entrances in cut sections, the cuts should be opened to provide a safe sight distance.
6. Developers of subdivisions should be required to build service roads so as to eliminate the need of entrances for every 50 or 75 foot lot.

#### *Commercial Entrances:*

In considering locations for commercial establishments, one of the major factors from a business standpoint in determining the best location is traffic volume. In the past, owners selected sites at intersections with the thought in mind of drawing their business from the traffic on both roads; consequently, such intersections have been choice sites. However, in the past several years research has proved that businesses located at heavy-volume intersections have suffered a loss in business due to the inability of traffic being able to get on or off the highway. This is especially true at signalized intersections that are operating near capacity. At such locations, free movement to the highway is limited to one movement; that being a right turn away from the intersection.

In approving applications for the commercial entrances the following specifications should be met:

1. Width of entrances and evits should be limited. Due to different conditions, it is impractical to set a definite maximum length. However, in the majority of cases 35' widths plus radii as long as practical are recommended.
2. Entrances should be well delineated.
3. Entrances should be separated by islands of at least 20' in length.
4. The islands between the driveways should extend from 8' to 10' from the edge of pavement to the right-of-way, so as to prevent the use of the right-of-way for parking or other services. However, in the case of wide right-of-way, the use of the area back of the line 15' from the edge of

the pavement is not objectionable from the standpoint of being a traffic hazard provided approaches and islands are constructed as described. Island areas should be protected by curbs, posts or other physical barriers. If the areas are planted, the plants should be of a kind that are not tall enough to obstruct sight distances.

5. At intersections the edges of entrance should not be closer than 30' to the right-of-way along the major road and closer than 20' along the minor road.
6. Edges of approaches should not be closer than 10' to the side property lines, so that if the adjoining property requires an entrance, the 20' island would straddle the property line.
7. On heavy travelled dual highways, medians should not be cut to provide openings at entrances.

In order to illustrate desirable and undesirable entrances, I cite the following examples:

One of the best designs that I can think of which creates the least traffic hazards and inconvenience to the traveling public and also provides orderly movement and parking is the new shopping center located on the north side of US 421 just west of the City of Lexington. This center has two approaches which are several hundred feet apart. The area between the approaches and between the edge of the pavement and the right-of-way has been landscaped and sodded with blue grass. Traffic can get off the highway and has ample parking space and when entering the highway they enter at 90 degrees and have sufficient sight distance. If the traffic volume ever justifies the erection of a traffic control signal, no problems will be involved as the traffic is all channeled to one point and can be controlled with a simple two-phase signal.

Another location that illustrates both poor and good design is on US 60 at Hubbards Lane just east of St. Matthews. On the southwest corner of this intersection there is a drive-in restaurant which does a tremendous business. The layout of the entrances and parking areas is of the best. There is an entrance to both US 60 and to Hubbards Lane and both of these entrances are located at over 150' from the intersection. There is a low pipe handrail fence and a low hedge at the right-of-way line of both roads and all parking is behind this barrier, leaving the entire area free of parked cars or any other obstructions to sight distance.

Just across Hubbards Lane on the southeast corner of the intersection there is a shopping district which is an example that is typical of the many locations on the State highway where no permit was obtained for entrances and where the right-of-way is used for everything but the purpose for which it was intended. The entire area between the edge of pavement and the buildings has been black-topped for several hundred feet on both US 60 and Hubbards Lane. Cars park head-on against the buildings and back out into the moving stream of traffic. The intersection itself is signalized with a semi-actuated signal. Since the shopping center is a heavy traffic generator and the cars leaving the parking area wishing to cross US 60, it was necessary that the detector be installed within 30' of the edge of the pavement, whereas the standard practice is to locate the installation 100' or more from the edge of the pavement. Due to this condition, this signal never has and never will operate with any degree of efficiency until such time as barriers are erected in order to force the traffic to pass over the detector. The traffic also can cut corners to avoid the protection of the signal and the paved area around the corner of the intersection is inviting to cars entering the parking area to drive diagonally into this area. Layouts such as this where there is no orderly and defined movement also provide enormous areas where accidents can and do occur.

One other location where there is now a traffic problem which was recently brought to the Division's attention is on US 68 just west of Campbellsville where a new textile factory has just been completed. The Secretary of the Campbellsville Chamber of Commerce and the owner of the factory both asked the Highway Department to do something about the problem. An investigation was made, and it was found that the right-of-way along the entire frontage of the plant property had been graded off and surfaced with trafficbound material.

The plant manager advised that cars leaving the plant had no trouble entering the highway due to the relatively light volume of traffic but that the problem and the hazard was created by impatience on the part of employees and that at some times as many as three cars abreast were jockeying for position and trying to beat the other one on the road. Other problems are created by circulating and waiting cars picking up passengers at the time of shift changes. This problem could have been avoided and it can be corrected now by confining the entrances and exits to one or two lanes and by providing one-way movement for this circulating traffic.

*Conclusions:*

The Highway Department's standards for entrances, both private and commercial, are adequate. The procedure and method of handling applications for entrance permits are good but for reasons undetermined, the Highway Department has been unable in many instances to require property owners to locate and construct entrances to meet specifications. The attitude of some owners is that they own to the center of the road and that they can do as they please. It is true, some, or all, deeds written some years ago do describe property to the center of the highway. County courts have failed to cooperate with the Highway Department in forcing property owners to remove encroachments. Engineers and public officials have a public relations job in selling property owners the advantages of well located and well constructed entrances and that such entrances will not be a detriment to business.

The statutes covering the authority of the Commissioner of Highways in the granting or refusing of access to the highways and the use of the right-of-ways should be studied by the Legal Section; and if it is found that the Commissioner of Highways does not have absolute control over entrances, statutes should be revised so as to give him this authority.