INTRODUCTION

One of the concerns of the Indiana State Highway Commission and citizens throughout the state is speed rezoning. The PTA wants a 10 mph zone here, the shopping center wants a 30 mph zone there, the tiny hamlet with a major highway through its center wants a 20 mph zone here, and so on. The problems encountered in rezoning are: illegal placement of signs, improper signs, and non-uniformity in the establishment of zones.

STATED PURPOSES FOR SPEED ZONING

Speed rezoning is not much different than speed zoning. Speed rezoning, merely doing again the procedures performed in speed zoning. There are many statements that refer to the purpose of speed zoning. Purposes of speed zoning range from a statement by Brian Wilson, “The basic purpose of speed rezoning or speed zoning is to prevent accidents . . .” to a rather vague statement that has been made by the Ohio Department of Highways, “The purpose of speed zones is to apply in local situations where specific conditions render the statutory speed limit unsafe or unreasonable. . . .”

Another purpose of a speed zone, as stated by Purdue’s Professor Oppenlander in one of his research papers, is, “To find that optimal speed that minimizes the cost of transportation at a given location. . . .”

The purpose stated in “Traffic Engineering” by Matson, Smith and Hurd indicates that speed zoning, when properly applied, becomes a guide to safe and proper driving rather than an arbitrary restriction.

According to the “Traffic Engineering Handbook” the purpose is stated as follows: “A speed regulation notifies the driver of the maximum or minimum speed that is considered safe for the conditions that exist under normal circumstances on the traffic way, and is intended to establish the standard or speed limit within which the driver may be expected to safely react to the driving problems he may encounter.”

Finally, the basic rule from the “Uniform Vehicle Code,” states that, “No person shall drive a vehicle on a highway at a speed greater
than is reasonable and prudent under the conditions and having regard to the actual and potential hazards then existing. In every event, speed shall be so controlled as may be necessary to avoid colliding with any person, vehicle, or other conveyance on or entering the highway in compliance with legal requirements and the duty of all persons to use due care."

The law of Indiana states, in addition to an adaptation of the basic rule, that the authorities may determine and declare a reasonable and safe maximum limit, or in the case of a minimum speed, a limit which will not impede the normal and reasonable movement of traffic.

It is felt that some of these purposes are deficient in some ways. Also, someone would say the law or statute is not what it could be or should be. For instance, note the first definition which simply stated the basic purpose of speed rezoning was to reduce accidents or prevent accidents. If this were the prime purpose, the speed limit could be set at zero to achieve the objective. It is apparent then, that the safe and efficient movement of vehicles must also be considered.

UNIFORMITY IN SPEED ZONING

It is important to note at this point that the 1967 speed laws apply to all streets and highways within the State of Indiana. Chapter 48 of the acts of 1939 requires the Indiana State Highway Commission to adopt the policies, procedures and warrants for the use of traffic control devices on all street and highways within the state. Not only from a legal standpoint should uniformity be followed, but also from the individual driver's standpoint. He may be confronted with two to several different sets of policies and standards as far as speed limit signing is concerned. It will be confusing to him. Furthermore, the enforcement people will find it difficult for them to work with.

The 1939 act also requires the Indiana State Highway Commission to adopt a manual of specifications for a uniform system of traffic control devices consistent with the provisions of the acts of that year and previous years for the use of traffic control devices upon highways within the State of Indiana. The act further specifies that this uniform system shall correlate with and in so far as possible conform to the current system as approved by the American Association of State Highway Officials. Also the commission shall from time to time as it deems necessary, revise, keep up to date, and correct this manual.

Uniformity in speed zoning can take several different aspects, one being the uniformity of signs. If the speed signs used on county roads, city streets, and state highways were of the same size, shape, and
reflectivity there would be no doubt in the driver's mind what a speed limit sign would look like. Also the method in which the speed limit is established should be uniform. The Indiana State Highway Commission has adopted a policy for the establishment of speed limits on all highways within the state. If this is followed uniformly the driver and the enforcement people will have an easier job obeying and enforcing the speed limit respectively.

Also, let's consider uniformity to mean that the speed limit is reasonable, realistic, not unduly restrictive to the travelling public, and hopefully will assist in reducing the accident rate.

PURPOSES FOR SPEED REZONING

Why do we have speed rezoning? First of all, speed rezoning is done because of major changes in state statutes.

Secondly, speed rezoning should be done because of changing residential and commercial development along state highways or local streets and county roads.

Finally, speed rezoning is done because of reconstruction, including resurfacing of a roadway.

1939 LAW, PROVISIONS AND DEFINITIONS

The first reason mentioned for speed rezoning was the changing of state statutes. This recently occurred in the State of Indiana. The 1967 General Assembly made a major revision of the speed laws for the first time since 1939.

Consider the old law, particularly the definitions of prima facie speed and absolute speed. First of all, the 1939 acts stated an adaptation of the basic rule. I'm sure that if the basic rule were followed to a tee the accidents or mishaps would be a very minimum on our streets and highways. However the human factor is involved and there are problems.

The 1939 acts contained the provision for fixed or absolute speed limits which stated that no person shall drive a vehicle on a highway or other traffic way at a speed which is greater than the limit fixed by law. In other words the absolute limit is intended to be obeyed and not exceeded. There is to be no excuse for exceeding the absolute speed limit. Under the old law the maximum speed limit established by the state highway commission or local authorities was also considered as an absolute or fixed speed limit.

The third provision in the old law was the prima facie speed limit. This provision placed the burden of proof on the driver that his speed
was safe, reasonable and prudent if he were arrested for exceeding the prima facie speed limit.

THE 1967 AMENDED LAW

The law as it was amended by the 1967 General Assembly provides for a maximum speed limit and an absolute speed limit. The prima facie concept has been deleted. The law also provides for special speed limits for specific times of day, different types of vehicles, varying weather conditions, road conditions, minimum speeds, etc.

Once again the law states that the Indiana State Highway Commission *will* establish policies, procedures and warrants for the establishment of traffic control devices on streets and highways within the State of Indiana. I don't think that this point can be emphasized enough. This law, the sign manual, and particularly the subject of speed zoning considered here applies to all streets and highways within the state.

Consider first the establishment of a *maximum speed limit*. The law outlines that a speed limit in an urban district shall be 30 mph. An urban district is defined as "the territory contiguous to and including any street which is built up with structures devoted to business, industry or dwelling houses situated at intervals of less than 100 feet for a distance of a quarter of a mile or more." Any location that falls in this category can be posted for a 30 mph speed zone with no further engineering or traffic investigation required. Any other location on the system, with the exception of the interstate network of highways, should be posted for a 65 mph speed limit. The interstate, of course, is 70 mph. All state highways are to be posted in accordance with the above three stipulations except where they might be altered by engineering and traffic investigations. If the maximum speed limit is altered by an engineering and traffic investigation it then becomes an absolute speed limit. The posting of a maximum speed limit does not mean that that particular section of road will not require future investigation.

In regards to the establishment of an *absolute speed limit* on the state highway system, the state highway commission has the sole authority for the establishment of these speed zones. Furthermore, no speed limit can be established or posted without the proper resolution being adopted by the Indiana State Highway Commission. An absolute speed limit is not in effect until the signs are in place.

In order to establish the absolute speed limit, an engineering and traffic investigation should be conducted. (This will be covered in detail later.) According to the law, the absolute speed limit may be decreased to no less than 20 mph in an urban district.
The law goes on to state that the absolute speed limit may be increased to no more than 60 mph in an urban district during the daytime and to no more than 50 mph at night.

As far as rural areas are concerned the absolute speed limit may be decreased to no less than 35 mph. In no case should a speed reduction be in excess of 25 mph. The speed limit should be established in five mph increments. The sign to be used should be black on white and should be reflectorized. The minimum length of an absolute zone should be 1,000 feet. The commission has selected to seek the cooperation of the cities and towns in the enforcement of these speed limits by requesting that a traffic control agreement be signed. The policy states however, that the concurrence is not mandatory. If at some date in the future an absolute speed limit is no longer necessary and is rescinded, the speed will revert back to the maximum lawful limit for that area and shall be posted in that manner. All limits should be periodically investigated to determine if other limits are warranted. The above procedure is applicable also to city streets and county roads.

According to the acts of 1967 the state highway commission and local authorities have the power to establish maximum nighttime speed limits. Here again the proper resolution must be adopted prior to the posting of this nighttime speed limit. The law states that the establishment of the nighttime speed limit is not considered mandatory. The nighttime speed should not exceed 50 mph within an urban area.

The procedure for establishing a nighttime speed limit begins with an engineering and traffic investigation. This restriction is in effect only during the hours of darkness. It should not be established in conjunction with minimum or any other special speed limits and should not be considered in areas provided with continuous lighting.

The signs should be white over black as specified in the manual, and the daytime speed limit signs used in conjunction with the nighttime limit should not be reflectorized.

The nighttime speed limit should be considered in areas where there is a high incidence of nighttime accidents and where speed could be a contributing factor. If the number of nighttime accidents is more than one-half the number of daytime accidents, a nighttime speed limit should be considered.

In no case should the nighttime speed limit be less than 10 mph lower than the absolute speed limit. Furthermore, the nighttime speed limit should be considered for long sections and should be compatible with absolute speed limits.

The acts of 1967 also provide for the establishment of minimum speed limits. These are to be established by authority of the highway
commission, the toll road commission, or local authorities where applicable. Again this is to be on the basis of engineering and traffic investigations and at locations where slow speeds consistently impede the normal and reasonable movement of traffic.

The same speed check data used to determine the absolute speed limit is to be used for the minimum speed limit. The law states that the minimum speed limit is not mandatory.

The minimum speed limit should be used only with absolute or maximum speed limits.

The establishment of special speed zones on the state highway system is also provided for in the acts of 1967. The special speed zones can only be established by an engineering and traffic investigation. The law gives the state highway commission the authority to establish speed zones for different times of the day, different types of vehicles, varying weather conditions, road conditions, school areas, signal timing systems, variable speed lanes on expressways, on detours, in construction sites, and for special events. Special speed zones can be permanent or temporary.

Special speed zones should not be used in areas where either nighttime or minimum speed zones are established. A special speed zone should not be considered unless there is at least a 10 mph differential in speed from the maximum or absolute limits. Zones of this type should be well defined and adequately posted. Special speed zones of short lengths should be discouraged. An engineering decision must be made as to which type of speed zone is to be utilized by analyzing the needs of the particular area. Also it is advisable to record the times when the emergency controls or the emergency temporary speed limits are established and when they are removed.

The preceding briefly summarizes the acts of 1967 and the policies and procedures in regards to the establishment of speed limits on streets and highways within the State of Indiana.

ENGINEERING AND TRAFFIC INVESTIGATIONS

Engineering and traffic investigations consist of speed checks taken at locations where transitions in speed are likely to occur. All vehicles should be recorded and separate tabulations made for each direction of travel. The sample size should be 300 vehicles for each direction or a period of two hours of sampling for each direction, whichever comes first. The sample should be analyzed for the 85th percentile speeds and the pace. The 85th percentile speed should be the guide line to establish the speed limit to the nearest five mph. In no case should
the speed limit arrived at be more than seven mph below the 85th percentile or five mph above the 85th percentile speed. Sometimes the pace gives an indication of the speed limit to be used, particularly if there is a high percentage of vehicles within the pace. Research carried on by various colleges and universities indicates that the 85th percentile speed is a good characteristic for speed zoning. This assumes that 15 percent of the drivers will normally exceed a safe and reasonable speed. Research also shows that traffic responds to changing conditions on the roadway and the surrounding area in a manner that is definitely in the interests of safety. Therefore on the basis of research that has been done, it is logical that speed limits be established using as a basis the characteristics of traffic speeds observed on the roadway.

Secondly, a line diagram is to be included. This diagram should indicate the development, the alignment, intersections, the locations of the speed checks, and the existing and proposed speed limits. Thirdly, the accident experience for the section of road should be studied. Next, trial runs are to be made to assure safe and comfortable travelling on the roads. Physical features must also be considered and these may include sight distance restrictions. After studying all the above factors the proposed limits are to be arrived at.

POSTING OF SPEED LIMITS

An absolute speed limit does not become effective until the signs are placed. In urban areas all speed limit signs should be posted at a maximum spacing of 1,000 feet. A practical minimum spacing could be every city block.

In rural areas maximum speed limits should be posted at a maximum spacing of three miles. On the interstate system maximum speed limits should be posted in the proximity of the interchanges.

An absolute zone in a rural area which is less than five miles long, should be posted every one-half mile. A zone longer than five miles, should be posted every mile. In any situation, the spacing of signs should be adequate to encourage obedience and provide for a fair enforcement practice. Additional speed limit signs may be needed near traffic generators and hazardous locations.

Special conditions to consider in the placement of speed limit signs are the following:

1. No closer than 500 feet from a point of speed zone reduction
2. No closer than 2,000 feet from a stop sign or signal
3. Not inside of a curve sign with lower advisory mile per hour
4. Not inside of junction signage
When changing from an absolute zone to a maximum zone, the appropriate begin speed limit sign should be used. This is also true when changing from a maximum to an absolute and from an absolute to an absolute.

The speed limit ahead sign should be placed for zoning from a maximum to an absolute. The ahead sign should be placed 1,000 feet in advance of the begin in a rural area and 500 feet in advance of the begin in an urban area. Also, the speed limit ahead sign should be used when a reduction in speed between zones is in excess of 15 mph. This sign should be placed 500 feet in advance of the begin.

SUMMARY

Speed rezoning is the process whereby the traffic engineer determines the need for the maximum or absolute and/or special speed limits to provide an enforceable, reasonable, and not unduly restrictive measure to facilitate the flow of traffic and to decrease the traffic hazard while providing for the safe, comfortable and economical travel for the motorist and his passengers.