"TRAFFIC PATTERNS"

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In the Constitution of The Institute of Traffic Engineers, Traffic Engineering is defined as "that phase of engineering which deals with the planning and geometric design of streets, highways, and abutting lands, and with traffic operation thereon, as their use is related to the safe, convenient, and economic transportation of persons and goods". In the Division of Traffic of the Department of Highways, it is our job to constantly try to bring about the best possible balance between the factors safety, convenience, and economy in traffic operation on the streets and highways under the Departments' jurisdiction.

I feel sure that all of us who drive will readily agree that automobile travel is not as convenient as we would like to have it. For example, we often have to stop when we want to go, and have to drive slowly when we might prefer to drive faster. Similarily, when we pay our gasoline bills, insurance premiums, etc., we all would agree that there is room for improvement from the economy standpoint. We have only to read the accident statistics in our daily papers to realize that much remains to be done in traffic safety.

Why is it then, if we have Traffic Engineers working steadily to provide safety, economy and convenience in transportation, that we are obviously falling short of these highly desirable goals? The answer is quite complex. To begin with, we *have* achieved some measure of success in providing a certain level of safety, convenience and economy.

It is also very important for us to recognize that these factors are influenced by forces completely outside the province of the Traffic Engineer. In safety, for instance, good Traffic Engineering is a necessity, but so are good Enforcement and good Driver Education. Incidentally, psychological factors are also coming in for a greater share of attention in todays' accident picture.

Convenience is an extremely relative factor, and we should recognize that it will probably never be possible to provide the complete convenience which each individual motorist might desire. In improving the level of convenience of traffic movement for one group, it is often necessary to make movement less convenient for another group, and the Traffic Engineer is faced with the necessity of trying to decide how to serve the best interests of the largest group, consistent, of course, with the highest level of safety for all.

We must also recognize that it is impossible to make significant change in either safety, convenience, or economy, without exerting some influence on the other two. For instance, if a signal is installed at an intersection to make gaps in the main traffic stream to let side street traffic enter, this will usually result in improved service for side street motorists. It is likely, however, that delays to mainstreet traffic will be greater, thereby increasing operating costs, and it is also possible that more accidents will occur after signalization than before.

This is why the Traffic Engineer will invariably want to make studies before installing signals, signs, or other traffic control devices. He wants to be as sure as possible that what he does will bring about improvement in traffic operations, rather than bring detrimental to them.

We see then that these three factors are closely interrelated, and that the Traffic Engineer must work toward his goals by constantly trying to achieve a sometimes precarious balance between the three factors. We also see that the three goals cannot be achieved by engineering means alone, and that enforcement, driver education, and other influences as yet not clearly defined must also play their parts before we can reach the highest levels of balance between safety, convenience and economy.

We, in the Division of Traffic, then recognize that our efforts are directed at only a portion of the overall traffic problem. But we, of course, continue to try by every means at hand to be more effective in our assigned area of operation. At present, new sign standards are being developed. Street lighting is being used to combat confusion and hazard at night. A broad channelization program is being developed. We have an opportunity to review roadway plans prior to letting in order to try to remove any features known to lead to operating difficulties. More and more complex and expensive signal equipment is being developed and used in an effort to reduce delays without increasing hazard at intersections which must have signals.

Speed zones are re-studied whenever it is felt that existing limits are not effective. Consideration is being given to the use of pavement edge lines to guide the night-time motorist.

We see, therefore, that there are many effective tools at the disposal of the Traffic Engineer. It must be recognized, however, that each of these tools have limitations, and that their application must be preceded by suitable study to insure their effectiveness. As an example, the layman who is aware of accidents occurring at an intersection almost invariably will request the installation of signals. A study of the accidents, however, might show that signals would tend to increase, rather than decrease, the accident potential. Often, other measures can be applied in such cases to improve the level of safety, but these are rarely evident without suitable advance study. Mr. Galloway and Mr. Ethington, who will follow me on this program, will speak to you in more detail about the uses and limitations of some of these tools.

Shortly, I will show you some slides which show sign standards being used today. I hope that you will be favorably impressed with the higher standards which have been developed. Interstate standards are the highest available to date, and will undoubtedly prove very effective in making it possible for motorists to use the Interstate System without any hesitation or indecision. This is an extremely important consideration, since the confused or doubtful motorist will surely be in trouble in view of the operating speeds and volume conditions which will prevail on the Interstate System.

We have also come to the conclusion that somewhat higher sign standards should be developed for the higher type primary highways being built today. These standards should be higher than those in use on our regular highway system, but can be lower than the very high Interstate standards. Development work in this area is now being done.

Turning now to the slides, let's see what some of these sign standards look like.

Slide No. 1—US 60-460 Frankfort

At this intersection of two important US highways, the sign at the turning point is a 20″ x 40″ sign. This has been standard for this type of road system for some time in Kentucky. It is obvious that a larger sign would undoubtedly be much more effective. Note that this guide sign is approximately 5½ square feet in area.

Slide No. 2—US 60-460 Frankfort

In this slide you can see small overhead signs which have been added to each lane to supplement the information given by ground mounted signs. Incidentally, in this complex intersection, we can see most all of the operational tools available to the Traffic Engineer. It is in a speed zone. Ground and overhead signs have been used. Street lights are used. Lane usage arrows, and lane lines are painted on the pavement. Channelization has been applied to separate conflicting movements. Extremely complex traffic signals are used to assign right of way to conflicting movements.

Slide No. 3–I 65-KY 222 Hardin Co.
This shows a guide sign 30″ x 72″ (2½′ x 6′) used on a side road at its' interchange with the Interstate System. This type will probably be used as a standard in such cases, and will also be applied on more important primary roads. Note that here we have 15 square feet, compared to the 5½ sq. ft. in the sign in the previous slide.

Slide No. 4–US 421-60 Frankfort
This ground mounted sign is 5½′ x 4½′ and is used at an interchange on our primary road system. This sign has an area of about 25 sq. ft. The white on green colors are being used on guide signs which must be larger than the 20″ x 40″ black on white which we saw earlier.

Slide No. 5–I 264-US 31E-150 Jefferson County
This is a sign designed about three years ago for a system which has now been accepted in the Interstate System. It is to much lower standards, however, and may be replaced soon. It is about 6′ x 10′, or 60 sq. ft., and when replaced by a sign to Interstate standards will be about 25′ x 15′, or 375 sq. ft.

Slide No. 6–I 264-US 31E-150 Jefferson County
This guide sign is to Interstate standards and is 25′ x 12′, or 300 sq. ft. With signs of this size and quality, we should expect much less confusion and hesitation among Interstate motorists than we would have with smaller, less legible signs.

Slide No. 7–I 65 at KY 61 Hardin Co. (Advance)
This 25′ x 15′ is to Interstate Standards, and has an area of 375 sq. ft. All such signs are completely reflectorized, and appear the same at night as they do in day light.

Slide No. 8–I 65 at KY 61 Hardin Co. (Interchange)
This 17′ 9¾′ is also to Interstate Standards, and has an area of about 165 sq. ft.

Slide No. 9–US 60-421 Franklin Co.
These overhead signs are 9′ x 6′ or 54 sq. ft., and 10′ x 7½′ or 75 sq. ft., and are installed in our primary road system. They are to less than Interstate standards, but do a very effective guidance job at this interchange. We will undoubtedly begin to make wider use of installations such as this on our higher type roads. Note that lights are provided for nighttime illumination of these overhead signs, since only small amounts of light from headlamps actually reach the signs.

Slide No. 10–I 65-KY 155 Jefferson Co.
This is an overhead assembly on an Interstate Expressway. Such assemblies are mandatory at an Interstate Interchange having more than one exit roadway. These signs are 12′ x 9′, 10′ x 6¾′, and 10′ x 6′, for a combined area of 235 sq. ft.

Slide No. 11–I 65-US 31W Hardin Co.
This illustrates the elaborate warning devices required when Interstate segments are opened to traffic, but at the end of which the Interstate traffic must get back to a parallel route. These warning signs are 4′ x 4′, or 16 sq. ft., compared to our old standard of 2′ x 2′, or 4 sq. ft. Note also the use of other oversized warning signs and overhead flashers.

Conclusion–While we are today installing individual signs of up to 400 sq. ft. of area, compared to older standards which call for signs of only 5½ sq. ft., it is worthy of note that the Interstate traveller does not get the impression that the signs are too large or overdesigned. These large signs do, however, make it possible even for complete strangers to be confidently prepared to react correctly by the time they reach the point where they must react.