

"PLANNING ASPECTS OF THE HIGHWAY PROGRAM"

J. R. HARBISON

Director, Division of Planning
Kentucky Department of Highways

I think up to this point you have had a very interesting and informative meeting with many words of wisdom being passed on by some very distinguished persons. I hope that I may, in some way, not let the high level of achievement be completely broken down. Anyway you can take comfort in the fact that I'll not talk long and that it will only be a short time—so I understand—until some very understanding and generous people have provided a "social hour" whereby you can get a liquid "pick up" if I provide a verbal "let-down."

Planning aspects of the highway program—sometimes I think there are more unplanned aspects than planned; nevertheless, in order that we all get a general concept as to the scope of the highway program I feel it is necessary to relate to you some facts and figures—many of which you are probably already aware—which provide the foundation from which planning can shape a highway program. Let's see what we have to work with. Of the over 60,000 miles of roads of some description within the borders of Kentucky, the Kentucky Department of Highways has accepted approximately 21,000 miles of roads and streets for future improvement and maintenance. This mileage breaks down primarily on the four Federally designated systems. There are presently 616 miles of the Interstate system approved in Kentucky. There are over 3,500 miles on the primary system; over 15,000 miles on the secondary system; and over 400 miles within urban limits which represent extensions of the primary and secondary systems within cities which have over 5,000 population according to the last Census.

Now that we have set the relative lengths of these transportation lines, let's see what service each provides. Records indicate that—on the basis of total vehicle miles—that right now our primary system while only about 6% of the total road mileage in the state carries about 40% of the rural traveled mileage. Of course, our secondary roads serve the important function as feeders of local traffic to these other main arteries and the city streets are collectors of tremendous numbers of vehicle miles of travel by the urban-suburbanites in their work, service and recreational trips. And our newest Federal-aid system, the Interstate when completed we expect to carry about 20% of the total traffic statewide. This will probably be made up to a very large degree of what could be classified as through-traffic with either interstate origin and destination or intrastate trips of some reasonable length.

Along with the mileage and traffic service aspects of the state highway systems, we must look at the financial picture. Kentucky's 1961 fiscal year Federal-aid apportionment was roughly \$52 million. This broke down with about \$38 million for the Interstate system and \$14 million for the primary, secondary, and urban systems. For the past five years our ABC—primary, secondary, urban—Federal funds have been fairly close to the amount received in the '62 apportionment; however, the Interstate figure has fluctuated quite a bit. All Federal funds are a result of Congressional appropriation with the percentage of the ABC funds for Kentucky being based on relative area, population, and mileage of rural mail delivery routes of Kentucky to the total of all States and for Interstate funds, percentage of cost of completing the Interstate in Kentucky to cost of completing the whole system. And fortunately, the approval by the voters of Kentucky for the past two highway bond issues has permitted the maximum use of these Federal funds by making adequate state matching money available.

With this general information as the basic materials with which to build a highway program, let us turn to some of the tools which should be used to mold this program into a desirable, sensible, and workable plan. There are many factors which have influence on and are considered part of a "highway program." There are many approaches used and techniques developed and being developed in the "programming" field and the widespread use of such tools as needs studies, traffic surveys, sufficiency ratings, systems designations and priorities, capital budgeting, fund allocations, geographical distribution, economic impact, benefit-cost ratios, alternate route studies, and others.

While perhaps all of these tools are not applicable specifically to every planned highway project nor to the same degree, they are, nevertheless, factors which should be considered in planning any long range program. Most of those mentioned are familiar to all of you; however, I would like to comment on some of them as they relate to the Kentucky Department of Highways and the Planning Division.

In 1954, the Planning Division provided much of the staff to carry on the needy study contracted for by the Department with the Automotive Safety Foundation. This study provides some quantitative answers to two facts of which the Department was already well aware; That there were many miles of deficient highways in Kentucky and insufficient funds to correct the situation. Their findings showed, at that time, that more than half—52 percent—of Kentucky highways made up of all road and street mileage did *not* measure up to conditions tolerable for the then present traffic, and that over a 20-year period the total annual expected revenue, including Federal-aid, would provide only slightly over 80 percent of the necessary funds to correct this deficiency. In the same period, expenditures proposed on systems recommended for full responsibility of the Department of Highways would average about \$98 million per year or about 68 percent of all road and street cost. The proposed systems did not coincide with our presently recognized Federal systems. While there is not now available documented figures relative to the status at the present time, it is felt that we have and are gaining on this condition through the help of the bond issues and concerted direction within the Department. Only through the cooperation of every Kentuckian and vigorous efforts by the Department can any real significant progress be made.

Traffic, its magnitude, character, and desires, is perhaps one of the most important highway planning functions. You find sometimes, whether expected or planned for, it certainly provides one of the most cursed and discussed topics of the motorist and particularly if he has just been delayed or missed an appointment because of congestion. While future traffic is subject to the whims, tastes, and desires of innumerable individuals, we do our very best to try to predict what future volumes will be on any highway section. At best, this is a difficult task and a high degree of accuracy somewhat elusive. The Planning Division makes many counts all over the state; makes studies as to truck weights and type; peak hour volumes; classification of vehicles; and origin and destination studies. It is with a searching analysis of this information that an educated traffic prediction is made. Because of the ever changing local picture having an influence on traffic on those 21,000 miles of highways as well as the empirical adjustments required in any count due to hours of the day, day of the week, month of the year in order to establish an average daily traffic figure that make obtaining more accurate and up to date traffic information a real problem. We are hoping to get some additional personnel and equipment to improve this operation.

The use of sufficiency ratings is quite common in program planning. The sufficiency rating of any section of highway is its numerical value relative to a chosen standard of complete adequacy which is usually the accepted current design standard for the assigned traffic. This is most often on the ultimate rating of 100 for maximum points on all functional, structural and safety features considered in the rating. The sufficiency rating is not intended to provide all the

answers in program priorities, but it is an excellent aid when evaluated in its proper perspective. A sufficiency rating of the primary system in Kentucky was published last year which showed 80 percent rating below 75. Field data was obtained for a rating of the secondary system which is expected to be compiled and printed this year.

While system designation among the Federal-aid systems is governed to a large extent by the allocated mileages, these systems should follow routes having the service level and characteristics which are indication of their name and classification. With our newest Federal-aid system, the National System of Interstate and Defense Highways, assuredly becoming a reality and the proposed Eastern Kentucky and Western Kentucky Toll Roads having an efficacious influence on the now existing travel pattern, it is only reasonable to expect that some realignment of system designation should be made.

Capital budgeting for the Highway Department is very much like dealing with problems you or I have with our own salary budgets, we think it would probably be much easier if we had more to budget with. However, a strong and effective long range capital budgeting procedure should prove invaluable as an administrative tool for planning and control of the highway program.

The Benefit Cost Ratios which are often prepared while planning a highway project is a tool which can be useful in determining alternate route feasibility, but one which has limitations which should be recognized and given proper weight with the other engineering, traffic, service, economic and planning information. The Users Benefit-Cost Ratio as outlined in the AASHO manual expresses the relationship of the annual difference in total construction and maintenance costs to the difference in vehicle operation costs over alternate routes. As you can see accurate estimates of cost and forecasted traffic volumes are important.

Presently underway is a major effort to build an adequate and well qualified staff for advanced planning which will operate as a special section within the Planning Division with assistants in the new district offices. It is expected that this section will make comprehensive route planning studies both as to systems statewide and individual sections in urban as well as rural areas. These comprehensive studies are expected to reflect, as required and in some detail, route location and alternates by corridor; general grade and alignment characteristics; estimated principal item costs; access; traffic service, economic impact; user benefits; and consideration of existing and future residential, commercial, community and industrial developments to what extent might be known. To do this it is hoped that as the talent can be found, this Advanced Planning Section will be staffed with highway engineers trained in all phases of work, a city planner, a traffic and transportation engineer, and perhaps an economist. We recognize that it may take some time and doing to accomplish this and become fully operational. We are hopeful, and I personally feel that this could be of constant and tremendous aid to the highway administrators and certainly would provide the nucleus for the preparation of a long range program.

There are two not-so-much discussed items relative to planning and programming which I think worthy of mention. One is that of "political commitments" which I'll leave with no further comment, and the other is "public acceptance" on which I will comment.

Often we fail to gain the "public acceptance" because the persons who are most directly effected do not understand what problems the Department is faced with in providing a highway improvement or why the design is apparently so elaborate that they are affected more extensively than would seem necessary. I would certainly not propose that we lower design standards in order to benefit some individual's whim or desire, or give preferential treatment at the sacrifice of good, practical, recognized design and safety, but I do think in some cases we could more nearly tailor our design and needs to the project without serious compromise.

I am suggesting that where a good, free flowing line of information does exist between all the agencies involved in the total highway program and the general public, that public acceptance is more likely to be forthcoming; that this public acceptance is needed and highly desirable, and the real success of our efforts will to a large degree depend upon whether we gain this public acceptance or not.

There are some special planning problems which we find ourselves "smack-dab-in-the-middle." I feel sure there are those learned persons who can give a very thoroughly detailed and objective answer as to the "how and why," for the problems I'm going to discuss briefly but it seems to me that they all stem from the lack of planning or adequate information from which to plan; uncoordinated or badly timed planning; and make defensive planning necessary in their correction. Of course they do not necessarily point to a mistake by any one person and the crystal ball techniques were not so highly developed.

Time after time in attempting to solve a particular highway problem, the planning limits are narrowed down to what can feasibly be done within reasonable financial expenditure and physical restrictions. For instance, a considerable length of a secondary road is all slightly substandard by today's standard and traffic, but has a few hazardous situations spotted here and there; traffic will be somewhat stable because of limited potential development and overall service; you improve the unsafe or hazardous situations only and depend on good maintenance. Or can you completely rebuild a costly facility because a new industry produces aggravating peak hour congestion.

Within recent years, water resources projects by other agencies have caused some "emergency planning" situations. When major dams are constructed and huge reservoirs are formed and in the process existing roads are inundated, this means relocation will have to conform to the impounding timetable. While Uncle Sam is willing to finance "in kind" replacement this does not change the fact that the importance of this road will probably be increased because of the recreational attraction of the reservoir and that should the Department not be planning an upgrading of the affected road until some later date, financing at the State level is not set up and if the up-grading funds are made available at the earlier date, some part of the presently planned program must be delayed until funds are available. So you can see this "demand" or substitute planning can cause problems.

Another special area of concern in the planning field is the urban transportation problem. This is one that is now receiving much attention at many governmental levels and exists nationwide. The most vital land areas in this country are the metropolitan areas. Approximately two-thirds of our population now live in metropolitan areas, and it is expected that by 1975 over 80 percent of our 215 million people will live in these areas. Over 95 percent of our population growth in the last decade has been in the metropolitan areas, and statistics show that more than 40 percent of our 750 billion vehicle miles are traveled on our urban streets and highways. In the last 10 to 15 years our old central cities have been subjected to an "enmasse" flight to the suburbs and the urban areas are sprawling. This has been made largely possible by the automobile. The most vital highways in terms of traffic volumes are the present and planned systems of major streets and expressways. These are mainly planned and built by the State Highway Departments with approval by the Bureau of Public Roads and with state funds supported by Federal-aid. This single source is contrasted with the metropolitan areas themselves where they are built by multiple private enterprise and a variety of independent local governments. With this very brief general picture, it is apparent that the problem is very complex and calls for the utmost in cooperation, understanding and advance planning by all concerned to bring about maximum desirable benefits.

Highways play such an important part in most every individual's life and exerts so much influence on their physical, economics, social and even traditional

patterns of living that their every detail should be planned to best serve the total systems and traveling public. Let us recognize the limitations of the processes of planning, but never let us fail to obtain the maximum limits of progress because good planning was not recognized.

I hope my interest in and prejudice for a strong planning program has not been too obvious.