THE HIGHWAY PROGRAM FACES NEW CHALLENGES

an address by

Francis C. Turner, Director

U.S. Bureau of Public Roads

at the

Illinois Editors' Highway Safety Seminar

Rockton, Illinois

May, 1968

I would like first of all to thank you for inviting me to join you in this seminar. Highway engineers are sometimes accused of operating from ivory towers and there is a strong implication in this that we may be lacking in an actual awareness of human problems. I emphatically deny the charge. To a certain extent, at least, editors may also be victims of this delusion.

So I think that meetings such as these have the side effect of helping to dispel that notion while serving the meeting's stated principal purpose of promoting highway safety, here in Illinois and all across the Nation.

You have an impressive amount of traffic safety expertise here so I won't try to pose as another expert before an audience of experts. I thought probably the best contribution I could make would be to tell you something about the highway program as I see it stretching ahead and to try to answer a few of the most frequent and recent criticisms of it.

In these days when motor vehicles and highways are blamed by some for a large share of everything wrong in our contemporary society, it may be appropriate to recall that we had nearly 3 million miles of roads and streets in this country in 1916 when we had only 102 million people and 3.6 million motor vehicles. That was the year when Federal aid for highways was first authorized. In the years since, this total has increased by only about 700 thousand miles—to some 3.7 million miles of roads and streets of all kinds.

Existing System Improved

Most of the investment in highways during this period has been committed, not to new routes but to improvements of an existing system. In other words, the joint effort by the Federal and State governments has been directed largely toward improving—in terms of capacity, utility and safety—the basic network that we had since horse-and-buggy days.

The point of these opening remarks is that there is no bulldozing maniac in a black hat tearing everything apart just for the sport of it—or out of sadism or just plain cussedness. The new mileage which has been added to the highway network in this past half-century has been in response to a demand for mobility which becomes greater every year. And there is no end to this demand in sight, especially in the urban areas, where the majority of our people already live and where this majority will increase to dimensions that will become truly awesome in the later years

of this century. When I use the word "awesome," I am not referring to the right of people to live where they choose, but to the problems which the continuing urban gravitation means in terms of moving them around to and from the places where they wish to go.

Some of those people who propose mass transit as the easy and instant solution to all of these problems either don't know about or deliberately ignore the nature of these daily movements by our urban population. The great mass of urban area travel is entirely separate from the home-to-job commuting pattern which is the only part of travel these mass transit planners are considering. As much as 95 percent of all travel in the largest cities is concerned with trips which are almost entirely dependent on the private automobile or taxi since they are of a type which neither rail nor bus transit can accommodate.

People Prefer Automobiles

But even more to the point is the indisputable preference of the American people for transportation by automobile. If there was ever any question about this, it was resolved in two opinion surveys recently completed for the National Academy of Sciences by professional poll-taking contractors. The surveys together covered more than 5,000 households and the great majority of respondents reported that they consider the automobile as much closer to the "ideal mode of transportation" for all trips except business trips over 500 miles. Public transportation of all kinds—air, train, bus, rail transit and taxi—was considered closer to the ideal mode by only 12 percent of those responding to the poll.

Yet despite this overwhelming preference for the private car and the flexibility it affords, there have been loud critics against highways and the internal combustion engine, particularly in the urban areas and particularly in relation to freeways. We have a whole new breed of amateur instant experts who would do away with highways altogether and force everyone to ride a subway or some kind of magic carpet that exists only in the minds of dreamers.

I would like to digress a minute, if that is the word, to mention the situation in Washington, D.C., because it illustrates all of the elements of the problem. A subway system is moving toward the construction stage and work has been halted on freeways planned for as long as ten years in cooperation with the States of Maryland and Virginia.

I am not contending that the subway is impractical or unneeded, merely that it is no substitute for the planned freeways. The opposition to the freeway program has come from various interests and groups, particularly from the poorer elements of the population who fear displacement and also contend that freeways are rich men's corridors. Their criticism overlooks the fact that both the freeway and rail systems were jointly planned to complement each other and that major change in the plans for either mode will require complete revision of the whole transportation plan.

There are two significant point in this connection. First, the problem of dislocation has certainly not gone unnoticed in the District of Columbia. For instance, the entire design of a freeway was scrapped by the Highway Department to move the location over to the Baltimore and Ohio Railroad and reduce displacements by 75 percent after a public hearing was held on the proposed plan.

Second, the cost per person per trip for the subway system is considerably more than the freeway-bus-street combination. Official projections indicate that in 1990 the $2.5 billion D.C. transit system will handle only 22 percent of the peak-hour work trip movement of people; while the cost of all of the proposed freeway system plus other new highway and street needs over the next 20 years is estimated at something like $2 billion to handle 78 percent of the peak-hour work trip load, including 47 percent of the load in the central business district. Bear in mind that this is only the peak-hour work trips, and not the total daily load. Good transportation is for all segments of society, including the underprivileged, and a lack of transportation especially hurts the poor. The bus-freeway-street combination provides the greatest flexibility at the lowest cost to answer this "poor-man's" transportation need.

I had occasion recently to attend a seminar on technology and urban transportation. The speaker was a young man full of big words and bright ideas about urban transportation, but if you analyze them, the ideas are long on imagination but short on both accuracy and practicality. I think some of his general statements may be of interest, along with my reaction to them.

Are Highways Subsidized?

One of his key theses is that highways are subsidized and this gives them a competitive advantage over other transport modes while they create no benefits to urban areas.

In answer to this, I would have to deny all counts. Highways are not subsidized. They are paid for by the people who use them and pay their various use taxes for the privilege, plus about a 25 percent average surcharge which is diverted to general government purposes. Highways are beneficial in and of themselves and the transportation they afford is a human and social value of a high order, serving to aid substantially in creating many of the other fine values which our society demands and enjoys. Highways serve many of these other human values especially in urban areas and we are encouraging their use as instruments of general social progress provided both these sets of values can be made compatible with the principal purpose of highways, which is to move people and goods.

The Bureau of Public Roads, in cooperation with the State highway departments, is encouraging what we call the joint development concept under which highways serve a multi-purpose function. They can be used, for example, to provide the "package" development of desirable non-highway needs such as housing, business, parking and recreational facilities above, below or alongside the urban highway. One of the most important social aspects of the joint development concept is the opportunity which it frequently affords for replacement housing of better quality for those persons displaced by the highway project itself. It also, of course, makes the most efficient use of both funds and space in urban areas.

Joint development is the answer in many areas to social and economic problems but we have found to our dismay that the foot-draggers in these projects are usually the other "jointees," rather than the highway people. So the highway official is often blamed for inaction on the part of others which is largely responsible for the plight of displacees. In any case, the opportunities which highways afford to rebuild a city far exceed the damage and dislocation which they sometimes necessarily cause and which are more subject to publicity.

We have literally hundreds of studies which show the economic benefits that highways bring with them. One of the most striking and best documented is the case of Route 128, a circumferential highway around Boston. It was opened in 1951 and it is estimated that by 1959, over $137 million had been invested in new plants employing some 27,500 workers along the route. Although some of this activity involved relocation, the net gain to the metropolitan area represented an estimated $129 million, and added

19,000 new employees to the area's payrolls. I chose that particular case because it was an eight-year study and one of sufficient depth to demonstrate that highways do have tremendous economic effects—and they are not all bad, as some of the current social experts indicate. The Boston experience with Route 128 could be duplicated in nearly any large metropolitan area in the United States where freeways have been built. In Cook County, Illinois, for instance, commercial land along the Edens Expressway rose in value as much as 750 to 1,000 percent over an eight-year period. The value of land along the New York Thruway near Syracuse increased tenfold in a very few years after the expressway was opened.

What About Social Problems?

The argument is made that the automobile and the highway have contributed to various social problems in the cities and have caused the mass flight to the suburbs.

I believe there is actually very little relationship. People move to the suburbs for the positive values they find there, rather than to escape the negatives of the inner city. I have no doubt that he ghetto dweller also aspires to move to the suburbs—again because of positive values. As a people we strive for the luxuries of life, something more than the minimum. We want to have two cars, dessert at dinner, an extra suit of clothes, presents for the kids—things beyond the basic food, shelter and clothing we must have to survive. The automobile did not cause the flight to the suburbs, but it did make it possible and this is obviously what the people wanted.

Presently, 67 percent of all American families in metropolitan areas live in single family houses, a proportion that is rising. Present trends and the results of surveys suggest that the preference of families for their own private homes in a suburban-type setting is deeply rooted. The metropolitan form of urban development has also allowed industries and businesses a wider freedom of location choice. The expectation is that in the future the growth of jobs will occur mostly in the suburban areas, with little change or a moderate rate of increase in the central city.

It is largely for this reason that mass transit—either rail or rubber-tired—cannot substitute for the private automobile. Transportation is an infinite number of personalized trips, some of which overlap each other, but most of which do not because of the many trips that begin and end at the doors of our homes.

There will always be an irreducible minimum of passenger car traffic, made up of trips that cannot be accommodated by any other means of transportation.

When I refer to mass transit I include another bright idea of our young friend—the moving sidewalk—which has some limited applications but is by no means an answer to our growing need for mobility.

This magic carpet fails to provide the solution because it doesn't take most people where they want to go. It would be practical only if it led from everyone's front door to his office, factory, church, store, doctor, dentist, drive-in, bowling alley, and satisfied the need for a hundred other routine, everyday movements of people. This not meant to deride any type of transportation because surely we will need all we have and all we can dream up to accommodate the ever-increasing need and demand for mobility.

How About Steam or Electric Cars?

There are those who say that highways are all right; it's the internal combustion engine that's all wrong. Some would substitute a modern steam engine or a battery-powered motor in the name of solving the air pollution problem.

Both have been been tried and both failed historically to provide the service which the gasoline-powered engine provided; hence they became outmoded. I am not saying that there is no future for either, but both are in the future while the need for mobility is at hand, here and now. Significant improvements in pollution-suppression devices are generally expected and these may go a long way toward reducing the air pollution which is admittedly a problem. A recently completed study suggests that through the use of control devices, reduction in the range of 83 to 94 percent in the pollutants emitted by combustion engine vehicles is commercially feasible within the next decade; however, the study shows that it probably will take at least another decade before the benefits of such devices will be widely felt, since the average automobile has about a 10-year life.

Regardless of the power which drives an automobile—steam, gasoline, battery—it has no effect on the total number of private motor vehicles and the congestion which we find in so many downtown urban areas, especially in peak hours. So we must look elsewhere for an answer to this problem.

Should We Restrict Driving?

There are some who would ban, restrict or otherwise make it difficult and expensive to drive a private automobile in urban areas.

This is negative and regressive thinking and a throwback to the days of Julius Caesar. Caesar, you remember, barred all except pedestrian traffic in Imperial Rome during the ten hours after sunrise. He also prohibited lady charioteers from driving in the city on Sundays or during times of heavy traffic.

This ancient Roman type thinking has suggested that tolls be imposed for urban auto travel, with the rates increasing as one approached downtown or during peak hours. Aside from the practical difficulties of collecting such tolls, the idea runs counter to one of the great pluses of our way of life—the ability to move about freely in living as well as making a living. There is another point of importance in this connection. That is that to raise sharply the price of commuting by car to the downtown area would have the probable effect of further accelerating the departure of industry from the central city to the suburbs.

In considering urban transportation, it is essential to keep in mind the way it is growing. Urban travel, in terms of vehicle miles, is now increasing at a rate equivalent to doubling about every 20 to 25 years. About half the yearly increase is accounted for simply by the increase in urban population. The other half comes from changing travel habits occasioned by the dispersal of homes and activities and by rising personal incomes.

The expected doubling of motor vehicle travel in urban areas by 1985 will certainly require some new facilities, including freeways, but much of this freeway mileage will be in outlying areas where there will be a minimum of dislocation. There will be a need, however, for some freeway mileage in built-up areas and here the problem of fitting them into the environment with maximum benefit and minimum disruption is admittedly difficult.

Freeways Use Little Land

The charge is frequently made that freeways "chew up" tremendous amounts of scarce urban land needed for other purposes.

The facts are that urban freeways presently planned will require less than 3 percent of the land in the cities. In Los Angeles—sometimes held up as a horrible example—the proposed 800 miles of freeways that will weave through the metropolitan area by 1980 will occupy only about 2 percent of the available land.

The charge has been made that half of the total area of Los Angeles is devoted to highways, streets and parking—in other words, to the motor vehicle. This is true of the central business district of Los Angeles, although a large share of the parking represents land in a transitional stage while it is being changed by developers into new high-rise office buildings. But 50 years ago, in the horse and buggy era, 35 percent of the central business district was devoted to streets, alleys, and sidewalks. So the alleged voracious demands of the automobile have required an additional temporary and diminishing 15 percent, surely not a high price to pay for the speed, convenience and flexibility of the private motor vehicle which makes all the rest of the 50 percent of occupied land as valuable as it is—and which value would not exist without the auto accessibility.

The California Highway Division has shown that in order to provide for between 50 percent and 60 percent of all travel in typical California communities, only about 1.6 percent to 2 percent of the urban area should be devoted to freeways; however, ten times this amount of area is required for the other 40 percent to 50 percent of the travel which takes place on conventional roads and streets. Certainly this is an indicator of the economic benefit and thrifty use of land which a freeway furnishes as contrasted to the conventional grid pattern of streets.

The Highway Division also discovered that when Captain John Sutter laid out the city of Sacramento in 1850 he set aside—not 1.6 percent, and not 22 percent, but 38 percent of the entire area for streets and sidewalks. It may be of interest to note also—along the same line—that when Pierre L'Enfant laid out the city of Washington in 1790, he proposed 59 percent of the total area for roads and streets. Thus it would seem that history shows us that our current auto-highway transport system has actually permitted us to reduce the area of streets from that felt necessary in horse-and-buggy days. The changed land use has obviously put land back into high economic use and produced jobs, income, and tax revenues that otherwise would not have existed for the benefit of either Sacramento or Washington, D.C.

In the District of Columbia the entire proposed freeway system would require only 2 percent of the land. But of this 2 percent, only ¾ of 1 percent would be paved; the remaining 1¼ percent would be open space—greenery and landscaping adding tangibly to this desirable objective within our cities. The percentage of the area of the District used for roads and streets has been steadily

decreasing, rather than increasing as is being alleged. This is demonstrated graphically in the Southwest area of the city. In 1950, before the Southwest urban renewal project, 48.2 percent of the area was devoted to roads and streets; in 1963 this had declined to 41.5 percent.

Best Bargains in Highways

Another contention is that freeways are inordinately expensive. Expense is a relative term. Obviously, urban freeways cost more dollars per mile to build than most of the rural connecting routes. But measured in terms of service to vehicles—and thus to people—they are the best bargains available in highways. On the basis of vehicle miles of use or service, they are the cheapest of all. To illustrate, the actual cost per vehicle-mile of urban freeways on the Interstate System is 0.646 cents. The comparable cost for the lowest type rural roads and streets is about 3.24 cents.

Another point that should be made is that freeways are by no means the private reservation of the passenger car, as some of the critics would have it. They also serve as main arteries for buses, providing safe, fast service en route, with local service at both trip ends. The place of bus transit in our total transportation system is of tremendous importance. Buses presently carry 70 percent of all transit passengers in urban areas. Bus transit is and probably will continue to be the only form of mass transit in at least 95 percent of our urban areas of 50,000 population, and in all smaller communities. Finally, as I indicated earlier, bus transit provides the greatest flexibility at lowest cost for those without automobiles.

We are making a special and continuing effort to encourage the greater use of mass transit by bus through the provision of better routes, either on freeways or on regular city streets or a combination of both. This makes sense, obviously, since the purpose of these arteries is to move people and goods, rather than just vehicles. At the same time, it serves the other desirable purposes of enhancing traffic safety and reducing air pollution in the urban areas, as well as easing congestion.

I should mention parenthetically that the congestion problem stems largely from the fact that most urban streets were laid out either before the advent of the automobile or before there was any general awareness of its potential. However, that doesn't lessen the problem nor the responsibility of highway officials to do everything possible to solve it.

There is a tremendous potential in the use of reserved lanes or reserved streets for buses, and the Bureau of Public Roads is allowing Federal-aid funds to be used for this purpose under certain conditions. Where bus service would not justify the exclusive use of special lanes during rush hours, buses could be given priority, with a limited but additional number of private cars also allowed. This is a new program—too new to have advanced very far—and there are at present no exclusive bus lanes in operation on freeways in the United States. But this will come, and in the meantime, at least 14 cities have established exclusive bus lanes in urban streets, with most encouraging results. The indications are that both buses and other vehicles can save 10 to 30 percent in travel time as a result.

Roads, Rails Not Interchangeable

Highway officials are frequently accused of having blind spots toward the advantages of other means of transport, particularly rail lines. If this was ever true, I am certain that it is not the case today because there is general realization that both kinds of facilities serve different components of travel. They are not interchangeable. In some cases, as in that of the Eisenhower Expressway in Chicago, they can coexist and complement each other.

On the other hand, such situations are rare indeed, and in any case where there is sufficient patronage to warrant a rail transit line, there are also enough highway users to require freeways or other high-capacity highways. So the answer in such heavily-traveled corridors is to provide both rail and highway facilities, even though the rail line may reduce the number of lanes required on the new highway.

Although a rail transit line runs down the center median of the Eisenhower Expressway, the great preponderance of potential customers rely on the freeway. Inbound person trips are split 42.5 percent by rail transit and 57.5 percent by freeway during the peak hours. Outbound peak hour trips do not differ greatly—46.8 percent by rail and 53.2 percent by freeway. When you consider a 24-hour day, however, the picture is vastly different. Here we find—on a 24-hour basis—that 71.3 percent of the inbound trips are by the expressway and only 28.7 percent by rail. Outbound trips are almost identical—71.6 percent by freeway and 28.4 percent by rail.

Moreover, the freeway and the city streets also carry the freight traffic of the city for its essential services and cargo movements.

They move the garbage and deliver the ice cream, move the firemen, police, doctors, school kids, fuel, groceries and do the dozens of other tasks which neither the adjacent rail tracks nor any other subway or metro rail line can perform.

In looking ahead, therefore, it is unlikely that any form of mass transit—rail, bus, air, hydrofoil, moving sidewalk or what have you—will eliminate the need for a continuing program of providing substantial additional highway facilities in urban areas and in stretching the capacity of those we have or are developing.

The Bureau of Public Roads recently submitted a report to Congress on the highway needs of the nation. This was in response to a Congressional directive and was based largely on data and estimates by the states. These data include a preliminary annual cost estimate of road and street needs for the years 1973-85. This comes to an average annual cost of $17.4 billion, which is more than double the $8.5 billion per year estimated annual capital accomplishments at the present time.

This is a monetary measurement, but there are others. In 1985, instead of 200 million people, we will have about 265 million. Instead of 100 million motor vehicles, we will have something like 144 million. And instead of 960 billion motor vehicle miles of travel per year, we are expected to have 1.5 trillion.

And these add up to the new challenges facing the highway program in the years ahead. Perhaps if you can find acceptable ways to keep people at home in substantial numbers, then the remainder could be accommodated on the existing system after a fashion and make new facilities unnecessary. But how will you choose those to stay at home—and how will you enforce your choice in a free society such as ours? My answer lies in just what we are now doing—responding to the general public demand to provide a good highway network available to all in the way that the people have spoken to their Congressional representatives—and by their use of the system.