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The Federal Aid Highway Act of 1944 -

A Promise and a Challenge to Cities

Address by H. S. Fairbank, Deputy Commissioner, Public Roads Administration, at a joint meeting of the Engineers Society of Milwaukee and the Wisconsin Section of the American Society of Civil Engineers held in Milwaukee on Wednesday evening, April 18, 1945.

At one time or another most of us have experienced a curious sensation of the vague familiarity of some place or circumstance in which consciously we have never been before. It is a rather common psychic phenomenon the explanation of which I do not know and have not troubled to find out. It has, I believe, nourished in some minds the superstition of a prior existence in which the subject experience, indubitably new in the present life, has been previously encountered.

A more plausible explanation might be that the sensation derives from a close similarity of the present place or circumstance with one which elsewhere and at another time has entered into our experience and our memory. In that way, at least, I am certain that I can explain my sense of familiarity with much that I observe in the present movement of events toward a new attack upon the highway problem of the cities.

More than thirty years ago I witnessed as an interested observer a similar procession of events leading to what later matured in a remarkable improvement of the arterial highways of rural America. When I first knew these rural arterials they were still largely undistinguished by designation, improvement, or use from other roads comprising with them the existing inheritance of primitive country roads.

Still, like all other roads, they served mainly the transport necessities of very narrow localities. But already their native users had begun to remark the passage of an occasional stranger. And most of these strangers came from cities in new-fangled automobiles that frightened the natives' horses.

Already there was evidence that this new and growing traffic from the cities would eventually extend to a traffic between the cities; and in a very few States the emergence of a new class of arterial highways had been signaled by the designation of State highway systems.

The time I speak of is 1910. A round ten years was to elapse and much misapplication of road building effort by both the States and the Federal government was to occur before clear recognition of the need for arterial roads to serve arterial traffic was to culminate in designation of the Federal-aid highway system and State highway systems in all the States.

The policy then established of concentrated application of Federal and State resources to the development of an arterial system resulted, in little more than another ten years, in the creation of a system of main highways which, imperfect as we now know it to be, was yet at the time an object of world-wide admiration. In its inception, however, that very successful policy was a policy directed solely to the improvement of rural highways. The original Federal Act prohibited expenditure for highways penetrating beyond the fringes of the cities, and many of the State laws embodied a similar prohibition. The Federal prohibition was removed in the early thirties; but it was not immediately replaced by a positive plan of city arterial development.

The Federal and State programs continued largely rural in their application, but with increasing concentration upon the modernization of the roads earliest improved, which by the logic of original selection were often at the nearer approaches to the cities. In this more recent work there has been fortunate occasion to deal with conditions approximating those that must be confronted in the cities themselves, and these sub-urban undertakings have provided the testing grounds for many of the devices, designs, and procedures that will find beneficial application in future city projects.

As now I observe conditions existing in the cities, and read the urban highway provisions of the Federal Aid Highway Act of 1944, it is the elemental similarity of those conditions and those provisions to the remembered conditions of rural roads in 1921 and the pregnant provisions of the original Federal Highway Act of that year that accounts for the sense that possesses me of events repeating themselves.

In 1921 the rural arterial highways of the country had yet to be clearly distinguished in the warp and woof of a rural road fabric largely local in its usage. Today the arterial highways of the cities are yet unclearly defined in the closer rectangular pattern of city neighborhood streets.

The earlier designation of rural arterials was followed by a sustained constructive effort which has progressively fitted these main rural highways to more efficient discharge of their distinctive arterial functions. So, we hope, will the similar

designation of city trunk arteries be followed by a determined and continuing effort to give these important urban highways the physical form which will enable them, with far greater convenience than at present, to serve their particular purpose.

If our present hopes are realized then, in the next twenty-five years, we may expect to see as great a change in the face of American cities and the ways of urban living, as in a like past period we have seen in the American countryside and many of the conditions of rural life. And, as certainly as the experienced rural changes have been caused directly and indirectly by highway improvement, so will the yet-to-be-realized urban changes result from the direct and collateral effects of a new facility of movement afforded by the more efficient pattern and design of a modernized street system.

In the Federal Act of 1944 there is the same promise of the possibility of realizing these urban changes as in the Act of 1921 there was the beginning, and the promised means which, rightly used, have so powerfully contributed to the already realized rural changes.

But, this promise of the Act of 1944 will not come unfaithfully to fulfillment.

In its specific terms the Act provides that there shall be provided for expenditure in each of the first three post-war years, \$125,000,000 of Federal funds, to be matched with approximately equal appropriations of State and city revenue. It requires that these combined funds shall be expended only for the improvement of routes of the Federal-aid highway system traversing urban areas. To these funds, earmarked for urban-area expenditure only, the Act permits addition of some part of the \$225,000,000 of Federal funds authorized for expenditure with matching funds on any part of the Federal-aid system in or out of cities.

The Federal-aid system in the cities comprises, or can be made to comprise some of the most important of urban arterial routes.

Most significantly, for the cities to ponder, the Act authorizes the designation of an Interstate Highway System of 40,000 miles, to join the principal urban centers, and at these to include circumferential and distribution routes capable of conducting through traffic around, and terminal traffic intimately from and to various parts of the cities. Herein, lies the promise of Federal cooperation in the improvement of additional urban arterials; for all such designated circumferential and distribution routes, as well as the main routes of the Interstate system, are automatically to be added to the Federal-aid system, therein to be eligible for improvement with future appropriations for that system.

These are the promises of the Act to the cities of the country: Of profound significance in the designational provisions; of immediate consequence in the authorization of expenditure in three early years; of possibly vaster consequence in the implication of other expenditure authorization to follow over a long period, if the challenge of these promises is squarely met by the cities.

For this Act is a challenge as well as a promise to the governments and people of the cities of the country. Will they meet that challenge? Will they have the faith and the imagination to apprehend the ultimate potentiality of this Act? Will they have the wisdom so to use the means initially provided as to demonstrate that intention faithfully to employ the further means that may be provided, which alone will assure the continued provision?

It is gratifying to observe that in Milwaukee the fullness of the promise has been appreciated and the conditions of the challenge will be met. You are moving promptly, planning intelligently, under able and imaginative leadership, to use wisely such part of the initial appropriations as may come to you. You are looking beyond the immediate future to prepare a longer program and a master plan.

I am told that there is agreement here upon the need of new expressways with differences only as to locations on which the desired facilities will be constructed. Your planners and engineers, in association with the engineers of the State Highway Commission and the Public Roads Administration, will find the way to adjustment of these differences. The origin-and-destination survey you wisely have undertaken will be helpful to that end.

The locational decisions may not be easy. The features of design, the standards of construction, essential to the creation of fully adequate urban expressways, will test your courage. You will need a daring beyond that necessary for the design and construction of arterial highways as they have been built in the past, in either the cities or the country.

The spatial environment and traffic volume of the average rural arterial highway is such as to permit service of both arterial and local traffic in the same traffic lanes. In the cities adequate accommodation of arterial traffic, elimination of the mutual interferences of arterial and local movement, and insulation of the heavy arterial traffic streams and bordering residential and business property each from the other, require the clear separation of arterial and local street facilities. The avoidance of frequent congesting stoppage of the arterial movement requires in the expressway design the elimination of all possible

crossing at grade. All this adds up to expensive construction - to capital requirements of such large magnitude that it is easy to understand and sympathize with the frequent effort of city governments to find a solution in cheaper improvements.

The trouble is that for the larger cities there is usually no cheaper adequate solution. The alternative widening of surface streets, to mention only the most common resort of timidity, can never fully meet the need and may be far from inexpensive. A classic example of the mistake of this temporizing response is the Woodward Avenue widening completed in Detroit at great expense some years ago. The widened street has merely invited more traffic and compounded the congesting possibilities of its numerous grade intersections with cross streets. Profiting by the lesson learned from this early mistake, Detroit now plans to build intersection-free expressways to allow arterial traffic to move freely between the periphery and center of the city without interference from local traffic.

When such expressways or controlled-access highways are advocated as the most logical method of handling mass movements of traffic with a minimum of restriction, there is often an underlying fear that the expressways may be built in the wrong locations; that future growth and alteration of the city along lines not now anticipated, may render the new facilities of little value to the people and industries they were built to serve. This fear induces a desirable caution in decision.

A city is a highly complex organism, not to be lightly tampered with. Changes of the street plan will inevitably affect many vital interests. Well conceived, the changes made will serve and can promote a generally beneficial urban development. Ill-planned, their direct and immediate benefits may be swallowed up in generally detrimental effects and the positive thwarting of desirable city growth and change.

Many things other than the replanning of highway facilities must enter into the city planners' consideration - schools, housing, parks and recreational areas, rail terminals, airports, facilities of internal mass transportation - to name only the more obvious. The plans for all must be accommodated, each to the others.

Facing so complex a problem, the adequate solutions of which cannot be other than expensive, with prospects of financial support usually of the slenderest, it is not to be wondered that city planners and administrators have been baffled and hesitant. The principal root of their difficulty: Money. So little money, so much of need. This or that? Where is the money coming from?

To all such capital-requesting city officials comes now the Federal government, in association with the governments of the States, offering capital aid for adequate improvement of arterial highways. It is inconceivable that the proffered aid will not be welcomed and soundly invested.

It is aid applied at a reasonable point of opening attack upon the complexities of the overall city-planning problem. Arterial highways, properly located and functionally adequate, must form the skeletal structure of any desirable city plan. The need of such a skeletal structure is beyond doubt. There may be question as to the desirable pattern of the structure and the location of its parts. There may be difference of view as to which of the several parts to build first.

These questions will be less difficult of answer, the differences of opinion less obstinate of accommodation, if certain facts and principles are kept in mind. All cities are alike in these respects: At the center there is a business or commercial area. From the periphery main highways, already established in arterial usage, radiate in the direction of neighboring cities. In the case of the larger cities a great part of the traffic found on these radiating highways near the city limits is bound to or from the city. At cities of over 300,000 population the proportion of this city-bound and city-originated traffic is usually 90 percent or more of the total. Of this large fraction the origins and destinations in various proportions, are in different parts of the city; but those of a large proportion lie in the central business section.

Here, then, we have certain fixed points of any city arterial system - the business center, source and objective of a large part of the city's external traffic; and the points at which the main rural arterials enter the city's periphery.

Beyond these peripheral points and along the radiating highways the city reaches out in finger-like development with generally undeveloped areas between the spreading fingers. This is the situation as we see it today.

At earlier stages of the city's growth there has been similar extension of development along these same radial lines. So that we are likely to find within the city, along the inward course of these same radial lines, the older and more compact residential developments and, usually, strings of business development.

Because of the traffic originated in, and destined to these more compact inner radiating zones, because this traffic in turn is directed in large part to and from the central business section, and because by historic habit these same radiating lines have become the principal avenues of approach from contiguous city areas to the city center, the external traffic is compounded as it enters and leaves the city with a volume of local traffic increasing with nearness to the central area.

This central area is the city's heart. It always has been. It always will be. It is now a heart congested by a traffic grown great with the greatness of the city - a traffic that daily flows in and out and through inadequate channels made less adequate by edging lines of parked vehicles and frequent stoppage of the flow at cross channels.

Around this heart area there is generally an enclosing layer of degenerate city tissue - a zone of more or less dilapidated buildings, usually old residences that have been converted to various commercial uses or allowed to deteriorate into sub-standard housing.

These are facts common to nearly all cities of considerable size and age. The existing facts themselves suggest the principles upon which a sound structure of new arterial highways may be patterned.

Obviously there is need in the structure for lines joining the peripheral points of entrance of the external arteries with the city center. These lines should be developed as channels of arterial movement only - the external and the internal arterial movement. They should be freed of all local movement and stoppage. This will require usually the opening of wider and protected channels.

Wherever there is sound city tissue, whether of residential or commercial function, the opening of these new channels should avoid its eradication so far as possible. For this reason the new channels may not be cut exactly along the lines of the existing congested streets serving the arterial usage. Yet the new channels must serve the same arterial usage.

The city center to which these lines lead should be rid as much as possible of traffic merely passing through. Its streets should be rid of vehicles standing day-long in space needed for moving traffic and the delivery and loading and unloading of vehicles essential to the transaction of business. The new free-flowing arterials cannot deliver their faster-moving streams directly into the very center of this relatively small area without causing congestion.

An arterial belt around the edges of the business section, at which the radial arterials would terminate and near which, in all parts of its circumference, would be the essential provisions for day-long parking of vehicles - such an inner belt highway would answer the needs that have been cited. It would conduct through traffic from one radial route to another, avoiding the necessity of passage through the business area. Its adjacent parking facilities, adjusted in location and capacity to determined needs, and sufficiently close to permit walking to all central destinations, would replace street space prohibited for parking use.

Receiving the concentrated traffic streams of the few radial arterials and filtering them to many orifices distributed around its circumference, such a belt highway would reduce the pressure and distribute the volume of traffic entering the central area and so minimize the possibility of congestion on the business streets.

Functionally similar to this inner belt highway, other belt routes may be described about annular zones within the city and about the city as a whole. The latter, in addition to its local distributive function, would also perform the special functions of a by-pass for the usually small fraction of through traffic.

What I have described may be considered an ideal pattern. It is, however, an ideal that fits the broad traffic facts of nearly every city. The task of the planner is to adapt the ideal to the conditions peculiar to the particular city. In his adaptation the ideal form, suggestive of the hub, spokes and rim of a wheel, will emerge in somewhat distorted form.

The inner belt will usually be a rectangle. The spokes will be diverted from straight lines to connect subordinate business and industrial centers, to follow a natural depression affording favorable opportunity for separation of grades at cross streets, to obtain partial lateral protection by skirting a park, to avoid cutting through a residential neighborhood that should be kept intact. The outer circumferential route or routes may follow the generally rectangular city pattern or the freer directional lines of suburban roads; the rim of the wheel may be bulged and indented in places. The whole wheel pattern may be chopped off at one side by a large body of water as in Milwaukee. The general pattern will be apparent nevertheless.

The development of truly free-flowing arterial highways along the chosen lines will require, eventually if not immediately, the elimination of grade intersection with crossing streets.

The expressway type that has proved most desirable in developed urban areas is that in which the express lanes are built at or below the general level of the surrounding area, with no direct access from abutting property and no crossings at grade. Such a highway requires a right of way of width approximating the length of the usual city block. Where the line of the expressway generally parallels one direction of a typical grid pattern of city streets, it is preferable to acquire the right of way between streets rather than to widen one street. Such a plan will possibly permit retention of the adjacent streets as the parallel local ways needed in conjunction with all city expressways. It also avoids some costly revision of underground facilities.

The elevated type of expressway is costly in construction. The prevailing impression that it is sparing of right-of-way cost, particularly that it can be located on existing streets without acquisition of additional right of way is seldom correct. An elevated structure can be built in a right of way barely wide enough to accommodate the structure itself, but this is rarely desirable. The street in which the structure is built must usually continue to serve the local traffic of abutting property. The columns necessary to support the elevated structure will seriously impair the usefulness of the street in this respect. The structure itself will block off light, and seriously damage property on both sides. It should be realized that where elevated structures can be justified the expected traffic volume will usually be great enough to require a four- or six-lane facility, and a structure width nearly that of the average city street; and additional space is required at intervals to provide for essential ramps. If right of way of sufficient width to avoid these disadvantages is obtained, the width may be substantially that required for a depressed expressway. The two principal advantages of the elevated type are that (1) nearly all cross streets can be carried under it, and (2) all underground and almost all other utilities can be left practically undisturbed. A further very serious disadvantage of even the well designed elevated highway is that it does not lend itself to stage construction.

This is a serious disadvantage, because a complete system of free-flowing arterial highways cannot be built overnight or even, perhaps, in a few years. The depressed type of expressway lends itself more easily to development in progressive stages. As soon as the lines of a route are determined it would be possible, for example, to develop the bordering local ways of the eventual expressway and use them as one-way streets with crossings at grades, even before acquiring all of the property between them. The right of way acquired and buildings razed, ground-level express lanes can be constructed between the local ways, with few or none of the street crossings separated in grade. In subsequent stages the original ground-level grade of the express lanes can be rolled under additional crossing bridges to be constructed, until the full development of an intersection-free facility is achieved.

The possibility of eventual development of complete systems of such free-flowing expressways, properly integrated into the general city plan, is the heartening promise of the Federal Aid Highway Act of 1944 to the cities of the country. Nothing less will afford the needed relief from the ills of traffic congestion from which we now for a brief period have only partial relief - and which are certain to return in aggravated intensity after the war.

The new Federal Act points the way to - yes, it actually requires - the taking of certain necessary basic decisions by the cities and the States. It provides a beginning, and implies a continuance of Federal aid at every step of the way to the ultimate goal - in the planning of the system and the design of its elements, in the acquisition of rights of way, and in the construction of the facilities.

Will the cities, reading aright the great significance of this Act, have the vision and the will to meet the Federal promise with the essential responsive measures demanded of them? That is the challenge of the Act to the cities of the United States.