

Session II

Impact of Highway Improvement on Land Use

Measuring Land Use Change Along Route 128, the Boston Circumferential Highway

A. J. Bone, Massachusetts Institute of Technology

Route 128 in Massachusetts is a facility whose impact has been widely discussed. This route provides a limited access loop around the congested Boston area. There have been several articles concerning that facility: "Industry" published an article in June 1955; and "Engineering News-Record" of October 13, 1955, and "Business Week" of May 14, 1955, both carried short stories relative to the spectacular industrial growth that is taking place there.

However, the Massachusetts Department of Public Works wanted to make a research study of the impact of Route 128 and obtained the assistance of the Massachusetts Institute of Technology.

This work is being financed by a grant from the Massachusetts Department of Public Works, matched by federal-aid funds, and is being done within the framework of the Joint Highway Research Project established between the Massachusetts Department of Public Works and the Massachusetts Institute of Technology.

Route 128 describes an arc around Boston at a radius of about 8 miles, with an extension to Gloucester. Such a route existed for a long time, but it went through nearly every congested center in the suburbs and therefore was not of much value as a bypass around Boston.

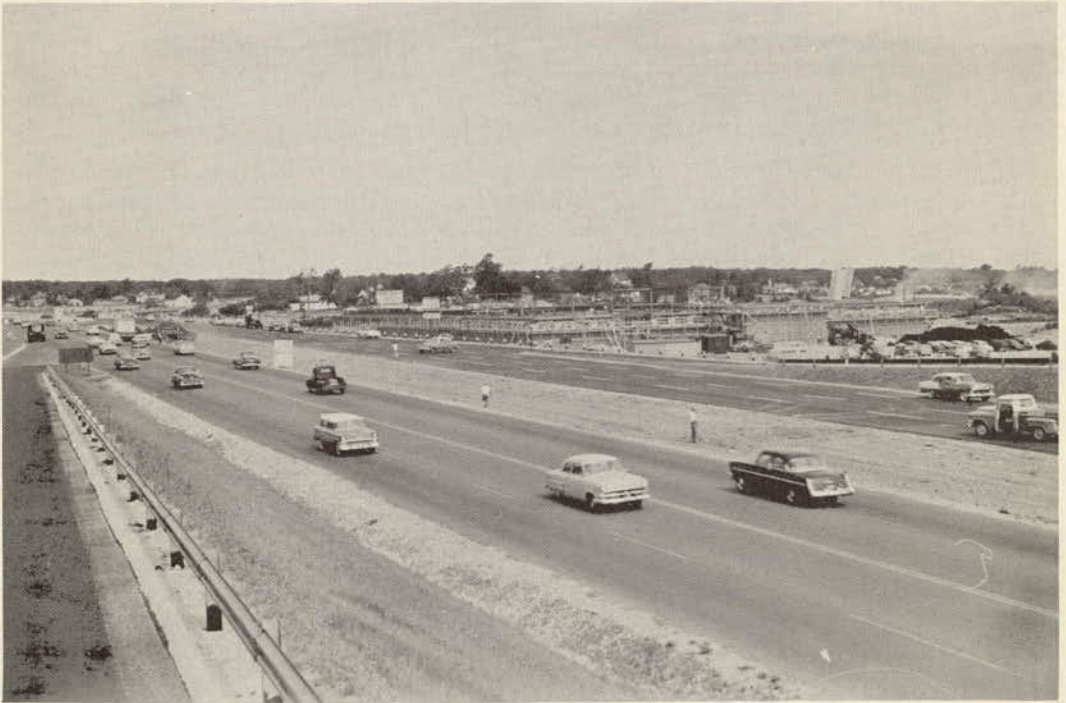
Starting in 1936 and still continuing, this road is being rebuilt as a limited-access 4- and 6-lane highway on a new location. The new location was placed in the nearest fringe of undeveloped land adjacent to the suburbs. That fringe of undeveloped land was the potential area of urban decentralization, but probably no one was quite aware of that at the time Route 128 was being planned. Two unforeseen things happened when the road was opened. First, about three times as much traffic appeared as was forecast; second, there was a rapid growth of industrial plants along the highway. An actual count shows that 65 new industries located there within the past few years. And this is only the beginning, because many tracts are being acquired with the idea of developing them into industrial or shopping centers.

Access to the road is only by the interchanges. Being a "free" road, the interchanges are quite close together at places, averaging perhaps two or three miles apart. In one instance—only one so far—the pressure of new industries has brought about a new interchange. Additional interchanges, of course, might adversely influence the efficiency of the road.

These developments along Route 128 are obvious to anyone who drives along this highway. One of the problems will be to determine to what extent the highway was responsible for these developments, or to what extent



A typical view of industrial development adjacent to Route 128, in the vicinity of Newton, a circumferential expressway in the Boston Metropolitan Area. The economics of this highway facility have been investigated in piecemeal fashion but a comprehensive study is now being sponsored by the Massachusetts Department of Public Works at the Massachusetts Institute of Technology.



Another view of Massachusetts Route 128, showing adjacent commercial development under construction at Dedham, Massachusetts.

the developments might have taken place in this area anyway. Much of the area was rocky and swampy, and it seems unlikely that the development would have taken place had the highway not been built there.

The efforts of certain promoters have been an important factor. They came in early, bought up the land, and offered package deals to individuals --making it quite attractive for them to locate there. Other promoters are still beginning to enter this activity.

The method of attack so far has paralleled that described by Mr. Adkins for the Dallas study. We are working with the cities and towns, because their governments in Massachusetts possess most of the useful information. Afterwards, we will have to assemble the data and try to see to what extent the highway has influenced growth.

In the town of Needham, for example, a new industrial center was opened and has now nearly reached saturation so far as available industrial sites are concerned. The net values created, minus cost of the improvement, have amounted to a savings of about \$5 per \$1,000 of evaluation on all taxable property in Needham in 1956.

The Chicago Transportation Study **J. Douglas Carroll, Director** **Chicago Area Transportation Study**

In the Chicago Area Transportation Study an attempt is being made to simulate, in model form, an entire metropolitan area, so that it can all be "remembered" on a computer in a very crude way. The operation consists of two parts: all of the land use of the metropolitan area is recorded and its transportation network also is recorded.

The economy of the area and the population are going to grow. But the shape of the growth is affected by the location of the transportation utilities. It is hoped, by manipulating this on a computer, first by revising locations and capacities of the network, to see what the consequences are in terms of land use readjustments. On the other hand, it is planned to examine land use growth potential to see what effect it has on the location of the highway network. We hope that these studies will yield some measures of the related effects of road improvements on land uses and, thus, land values.

In terms of total benefits, the problem is an interesting one. The benefits are calculated by simulating traffic flows through the road network and calculating the direct costs for building and the user's costs after each improvement has been added. If only one highway or one rapid transit route is built, the benefits accruing to the users from that particular facility would be very high, because of the low quality of competing facilities, that is, the benefits per unit of cost would be high.

As another piece of the network is added, the incremental savings due to the second facility would be slightly less per mile than the first one was; and so on, until the network is completed.

Now, the problem is how large a network to construct. Should one build to the point at which the gross benefits are exactly equal to the gross costs? At this point, we have perhaps substituted highways and transportation for health and welfare and other similar things. Obviously, we don't go all the way; we stop at some intermediate point.