

based on normal trend. This gain was about equal to the total net cost of the improvement.

In New York City, a study of changes in the values of improved properties adjacent to the Henry Hudson Parkway showed a rise of 2.51 percent between 1935 and 1938 while the values of improved properties in the areas near but not adjacent to the Parkway decreased 2.91 percent, indicating that the areas adjacent to the Parkway fared 5.42 percent better than the section as a whole.

The property along the Grand Central Parkway in New York City gave a net increase of \$4,117,990 in tax revenue above that which might ordinarily have been expected for the ten-year period ending in 1945.

Other examples of the effect of free-way development on adjacent land values are found in California. Much of the Arroyo Seco through Los Angeles, South Pasadena and Pasadena is located on park lands. However, a limited section is abutted by private lands and the market value as of September, 1947, was three to twelve times the value in January 1941, and in Los Angeles the increase has been about one and one-half to three times as a direct result of the construction of this facility. Similar increases in property values may be cited for the development in San Francisco of the Junipero Serra Boulevard, the Ventura Boulevard in the San Fernando Valley section of Los Angeles, and the Long Beach and Crenshaw Boulevards. The property values adjacent to these developments are now double the value of property on the next parallel streets.

These examples all very definitely show the effect on the tax ratables due to the construction of expressways.

TRAFFIC ECONOMICS

In the early stage of modern highway development the economic and social problems of highway planning and construction were less complex than they are today. The problems were mainly to make all-weather roads out of the then existing highways and to pay particular attention to those carrying the heaviest traffic. Furthermore, at that

time and with the volume and weight of traffic they then carried, the cost of the improvements was comparatively low. It was only in a few cases that the existing or foreseeable traffic volumes were so large that economic studies evidently were warranted, and it was there that the rational study of the economics of highways had its birth. With the present and evidently continuously increasing traffic volumes as well as unit costs of construction, the economic studies have become a necessity, and this applies particularly to expressways in urban areas.

The fundamental data for justification of an expressway must necessarily be the volume of traffic which is expected to use the expressway, not only at the time it is built but for many years thereafter. If immediate traffic should not warrant the complete construction of facilities which will be needed in the future, stage construction may be planned and provided for in the initial construction. For example, provisions should be made for the full number of lanes that may be needed in the future, but only those required for the immediate traffic need to be constructed in the initial stage. Similarly, provisions should be made the interchanges at places where future traffic may warrant them, but their construction may be delayed until the need develops.

An approximate estimate of immediate traffic can be had by a study of traffic counts on present roads within the scope of the expressway, but these counts only tell the volumes of traffic moving on the present routes. Usually they do not provide adequate information as to whether these routes economically serve the purpose or whether they are used because they are the only ones available.

A more complete answer to this question is obtained from properly conducted origin and destination surveys which give information about the points between which and in what volumes people desire to travel. The technique of carrying out these surveys has been developed during the past few years, particularly by the Bureau of Public Roads, and has reached a usable and satisfactory stage.

The information obtained from the traffic studies will provide the answers to the questions of number of lanes and to the location of interchanges needed now and in the future. These answers should be based not only on an average daily but on recurring peak-hour traffic. The 30th peak hour is widely accepted as a satisfactory basis for determining the required number of lanes.

The study of the traffic data should not be limited to the expressway and its interchanges but should be extended to the street system. It is evident that some streets will be relieved by the expressway of some of its traffic volume, at least for awhile, but on others the traffic will increase. This applies particularly to those adjacent to the entrances to and exits from the expressway. In addition, unless proper facilities are provided, the left turn movements on these streets may increase so as to interfere unduly with the traffic on the streets and possibly even with that on the expressway.

ECONOMIC EFFECT ON FRONTING STREET PROPERTIES

Some of the economic effects of expressways on properties fronting existing streets have been discussed in "Effect on Tax Ratables".

1. Business Areas.

A business area, being one of the principal areas served by an expressway, is benefited both through improved transportation service and through esthetic improvement when the facility is so designed. Both the user and the community are benefited.

Properties fronting on existing streets in the immediate vicinity of the expressway are more directly affected, and the effect is for the most part beneficial. Negative benefits may derive, as from the dead-ending of a street or from increased traffic and consequent congestion on some feeder streets, conditions which for physical reasons are sometimes unavoidable.

In a business district, the traffic and transportation problem involves the

handling of huge quantities of materials and merchandise in addition to the many people involved. A properly planned expressway will effect savings in the cost of this handling in facilitating rapid receiving and delivery. All are familiar with the seemingly hopeless congestion of commercial traffic on the streets in business districts. The expressway takes some of this load off these existing streets, relieving the congestion, and thus facilitating the flow of passengers and goods.

The easier flow of passengers and the added convenience will induce more customers to come to the district. The increased sales volume is a positive benefit to be carefully considered in an economic analysis.

Not only will customers and business callers be better served but also employees. In modern urban life transportation is one of the principal concerns of the employee. There has been a trend toward suburban development of residential areas, which in many cases are too sparsely settled to support adequate public transportation. The employee is forced to depend upon his automobile for transportation. An expressway providing him express service to the business district will benefit that business district in making it a more desirable place to work.

2. Residential Area.

Just as an expressway makes a business area a more desirable place to work, it makes an outlying residential area a more desirable place to live. The very existence of some outlying residential areas is possible only because the expressway provides convenient, rapid transportation service not otherwise available.

An expressway tends to remove from existing streets of the residential areas served all traffic which does not rightly belong on those streets, and in so doing the value of the area for residential purposes is increased. The growth of heavy street traffic in a residential area has almost always resulted in a deterioration of the area. When this heavy traffic is properly channelized by an expressway, this deterioration