

# Some Effects of Limited Access Highways on Adjacent Land Use

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● RECENT progress in state and interstate highway planning has placed increasing emphasis on the theory that the generation and distribution of traffic is a function of land use (1). Everyone familiar with transportation development knows the validity of the reciprocal theory—that land use is a function of traffic facilities.

The purpose of this paper is to examine the application of this theory to the limited access highways built through suburban areas under the new Interstate Highway System program. For present purposes suburban areas are considered as extending 30 to 40 miles from the centers of major cities and somewhat shorter distances from cities down to about 50,000 population. For convenience a limited access highway is called a freeway; this means a highway that has no access to adjacent property except at grade-separated crossings, called interchanges. (In a few cases there may be interchanges at grade.)

It is considered that the suburban land uses resulting from freeways will be more extensive and more competitive than is generally realized; that these land uses will generate new traffic of unpredictable volume; that unless they are adequately controlled they will impair the usefulness of the highway system and cause serious economic loss to local communities and their citizens.

Fortune Magazine (2) observes that Americans seem to regard the expanded national highway program merely as an impressive engineering feat, which they hope will finally clear up the traffic mess. As Fortune points out, "the program is going to affect the economy and the whole pattern of development in our metropolitan regions. . . . But the program is being guided primarily in engineering terms, and so far there has not been enough coordination between the highway departments and the other interests that will be so vitally affected."

The types and patterns of adjacent land use created by freeways are quite different from the strip developments that occur along major highways with continuous access. In the latter case the prevailing uses are retail stores and local shopping centers, motels, bars, restaurants, real estate and insurance offices, used car lots, and service stations. Some of these establishments serve their local communities; some are chiefly dependent on highway traffic. When such a thoroughfare is replaced by a freeway the proprietors of these establishments are sometimes told that their interests will be served by "frontage roads" affording unimpaired visibility to the passing traffic, which can reach them from the nearest turn-off.

If California's two-decade experience with freeways is pertinent, these frontage roads do not quite fulfill this function. Passing a small establishment at a 60 mile speed, the motorist gets only a flash glimpse of it on his right hand; if it is on the left-hand frontage road it is almost beyond the range of his normal vision. Furthermore, the motorist has learned that if he turns back to reach a frontage road establishment he will get involved in a labyrinth of lanes through which he will be lucky to win his way to the spot he is seeking. Frontage roads are costly facilities at best, since they serve land uses on only one side, and they create difficult design problems at interchanges (3).

## FREEWAYS ATTRACT TWELVE TYPES OF LAND USE

Although small commercial establishments have found it difficult to take advantage of freeway locations, the freeways are drawing to their flanks a dozen specific types of larger-scale land uses as follows:

1. Residential subdivisions and garden apartments.

2. Regional shopping centers and major regional stores.
3. Manufacturing plants and industrial parks.
4. Distribution warehouses, truck terminals, and area sales offices.
5. Bowling alleys, skating rinks, night spots, drive-in theatres, and other amusement centers.
6. Large motels.
7. Central office buildings for insurance, utility, and other companies.
8. Service stations and eating places.
9. Hospitals, churches, and other institutions.
10. Auction yards, farm equipment and used car sales lots.
11. Trailer parks.
12. Private and public airports.

Although all these land uses have long been highway-oriented, they suddenly expand in scale when they seek locations along a freeway. This is because of the increased potentials created for them by one or more of the following functions that a freeway performs to a much greater degree than an ordinary highway:

1. It provides quick access to other parts of the adjacent urban area.
2. It collects labor from a much wider area, bringing workers in all weathers from homes 30 to 50 miles distant.
3. It collects customers, clients, pupils, and spectators from even greater distances.
4. It collects and distributes supplies and products over a greatly extended range; the "overnight delivery" radius may be 400 miles.
5. It is an advertising channel of enormous volume and penetration.

Whereas it is obvious that all these functions attract the land uses in question to the vicinity of a freeway, the fifth function attracts them to sites adjacent to the freeway. Every one of the land uses that have been described wants to be visible to the freeway traveler. A single store on a frontage road gets only a split-second flash of attention, but a major establishment sited at the top of a long rise, at the foot of a decline, or in the hollow of a curve, has an "exposure" that is tremendous.

#### PROPER LOCAL ROAD DESIGN CAN PROVIDE ADEQUATE SITES

All these land uses, as already noted, require much larger sites on a freeway than they occupied on full access highways, and they require sites as near as possible to interchanges. To accommodate them adequately, a well designed local circulation system will provide, instead of a frontage road, a major street paralleling the freeway at a distance of 300 to 600 ft extending from the interchange as far as may be needed. This will afford space for establishments to back up against the freeway, with convenient access to it through the interchange and with full benefit of the freeway's advertising value. For service stations, drive-ins, and other freeway-related businesses, frontage roads may sometimes be necessary, but unless they are controlled by proper zoning they can develop new strips of blight. One frontage road on the San Bernardino freeway displays the following land uses in this order: (a) service station, (b) coffee shop, (c) junk yard, (d) motel, (e) trailer court, (f) bar, (g) grocery store, (h) shoe repair shop, (i) vacant building, (j) state highway patrol office, (k) three vacant buildings, (l) state employment office, (m) nursery school and (n) church.

But the land use that wants a freeway location most, and usually gets there first, is the residential subdivision. The subdivider is eager for the freeway traveler to know that Sunrise Ridge or Sunset Acres is just 20 minutes from the city or 5 minutes from the airport—"if you lived here you would be home now." He knows, too, that many people apparently like to live within sight, sound, and smell of the teeming freeway (4).

The subdivider who preempts a quarter mile of a freeway border and a quarter mile on both sides of an interchange cross-road will usually fasten a low-tax-revenue, high-traffic-hazard pattern on the area permanently. Not only do most subdivisions produce more local service costs than tax revenues, but they discourage the development of higher revenue land uses in their vicinity. Home dwellers who may like to watch freeway

traffic from behind a wire fence will strenuously object to having part of that traffic pass through their local streets, where their children play, enroute from the freeway interchange to a nearby industrial plant or a shopping or amusement center. The chances are, too, that a school will be close by to further inhibit traffic movement.

The subdivider gets a tangible benefit from freeway "exposure" in the promotional stage of his project, but the dweller in one of his houses does not get any tangible benefit. Thus the temporary advantage of one freeway-bordering land use results in the exclusion of other uses which could enjoy substantial permanent benefits.

Obviously the "highest and best use" of land in the vicinity of a suburban interchange would include freeway-related service establishments on the most accessible sites, larger freeway-oriented developments, commercial and industrial, in locations close to the interchange, and residential areas beyond. This is the pattern that creates maximum convenience, maximum land values, and maximum tax revenues. Combined with a well designed local road system it provides efficient movement of traffic between the freeway and the developments along its borders.

A good example of this kind of orderly development may be seen around the Valley Forge Interchange at the junction of the Schuylkill Expressway and the Pennsylvania Turnpike 15 miles northwest of Philadelphia. Here in a former farm area the supervisors of Upper Merion Township have created by careful zoning a logical pattern of commercial, industrial, and residential land uses (5).

#### LOCAL LAND USE CONTROLS ARE ESSENTIAL

But such a desirable pattern will only develop where the land surrounding an interchange is controlled by a single owner who understands its best use, or where local government, as in the case of Upper Merion Township, has a comprehensive plan implemented by precise zoning and adequate local road standards. Within the major incorporated cities this kind of planning can reasonably be expected; outside such corporate limits it seldom now exists (6).

State highway officials recognize that counties and townships, as well as cities, must engage in community planning if the new highways are to be protected against adverse use of adjacent land. Pennsylvania's Deputy Secretary of Highways, Carl W. Wild, said in a recent address that local planning and zoning are particularly necessary along the Federal Interstate System. "The interchange locations will present opportunities for well-planned commercial and other uses, or for the most chaotic development we have ever seen," he said. "The decision will be local." (7)

In urging counties, townships, and other local jurisdictions to meet the situation by appropriate action, the state and federal highway builders, the highway users, and the local citizens all have a common interest.

While the highway builders are not responsible for local planning, they are vitally concerned with it because new developments along the right-of-way will generate large and unpredictable volumes of freeway traffic. This can result not only in early over-capacity loading of the freeway itself, but ramps and interchanges may be seriously congested (8). A classic example is the Santa Ana Freeway southwest of Los Angeles on which, in addition to many new subdivisions, three large-scale traffic generators have been located in close proximity to each other—Disneyland, Knott's Ghost Town, and the Anaheim Shopping Center.

On a highway that is being converted to a freeway west of St. Louis the writer was recently stopped for nearly 15 minutes by several hundred homeward-bound cars of construction workers entering the highway from a huge new Chrysler plant that will employ several thousand men, all of whom will drive to work. Fortunately this development has occurred before the completion of the freeway, so that a proper interchange with adequate feeder lanes can be provided at this point.

When large industrial plants or amusement centers are located at intervals along a freeway their peak-hour traffic can move more readily than when they are heavily concentrated near a single interchange. When land is zoned for specific uses in logical and realistic relationship to freeway facilities, it is possible to estimate within some broad limits the new traffic volumes that will probably be generated.

The concept of comprehensive land use planning is new to most county and township governments in suburban areas. Many studies are being made of zoning and other devices for land use control, including the acquisition of easements, development rights, and wider rights-of-way on interchange approach roads. These studies are of basic importance to the success of the highway program.

One suggestion that appears to have considerable merit is to have the state highway commission or other state agency empowered to do the zoning job in critical areas bordering highways in case the county or township fails to act (9). This would of course involve the setting of some standards by the state for acceptable zoning patterns along state and federal highway—a logical recognition that such protection is essential if the highways are to serve the public purpose for which they are built—namely the safe and rapid movement of motor traffic.

It is not to be expected that a state highway commission would devise zoning standards for an extended area surrounding an interchange, as the Upper Merion Township Board did in the case just mentioned, though a state planning agency might do so. A highway commission's direct concern would be limited to assuring approach roads of proper width, unobstructed by the traffic of industrial, commercial or other establishments close to the freeway ramps.

To freeway users, land use planning as an accompaniment to freeway building is a matter of concern for obvious reasons. Their benefits of safe and rapid movement are in jeopardy if traffic bottlenecks develop through the overloading of off-ramps, congestion on interchange approach roads, or similar causes.

Land use planning is likewise of vital concern to local governments and citizens, since the uncontrolled development of land uses can not only impair property values and tax revenues but can lead to excessive costs in providing all types of local public services. If a freeway separates a sewage treatment plant, for example, from an area that is going to be intensively developed, foresight would dictate the laying of a sewer main beneath the freeway at the time it is built. Similarly, thought must be given to the location of schools, fire stations, parks, and many other local facilities.

"The new expressways are being located," say Harold M. Mayer, of the University of Chicago, "primarily with reference to their ability to move vehicular traffic. That is their function. But too little thought is being given to the relationships of the routes to the present and future patterns of commercial, industrial, and residential areas they serve." (10)

#### MANY PUBLIC AND PRIVATE INTERESTS ARE INVOLVED

While land use planning and zoning are immediate means by which the interests of highway builders, highway users, and local citizens may best be served, it is evident that the problems to be met will involve many agencies of local government and private groups as well. Districts or departments of recreation, public safety, transit, urban renewal, water and power, will all be directly involved in addition to the agencies that have already been mentioned (11). Marine terminals and airports, where they exist, will also be concerned with land uses bordering on the freeways. The railroads' interests were early recognized and helpful working relations between them and the highway builders have been established in most states. The annexation of suburban areas to incorporated cities, and the creation of new cities and towns, will be among the other developments that freeways will drastically affect.

This paper has dealt only with freeways built in suburban areas, where the problems of regulating adjacent land use are most numerous and acute. Similar problems will arise, though probably in lesser degree, in many rural areas. Implicit in all these problems is the effect of freeways on adjacent land value, which is the subject of many current studies that should produce a large amount of helpful data.

Meanwhile it seems evident that federal and state highway commissions will need to develop, on a voluntary or an official basis, relations with local municipal, township, and county groups to urge upon them the necessity for constructive action on the land use control problems in view. Such relationships should result in more realistic benefit-cost analyses, more useful freeway design, and more assurance that the freeways will serve their intended purpose.

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