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"Urban Growth and Mobility in the United States"

Urban mobility in the United States is dependent overwhelmingly on highway transportation. The great bulk of present mobility is provided by the private automobile, but public mass transit has a supplementing role in satisfying certain portions of the overall transportation demand -- and in most instances this means transit by buses on highways.

To define the part that each available mode should play in achieving improved mobility is a question of public policy. The question is not so much one of choosing between competing modes as it is one of providing an effective mix of complementary modes.

This mix must be tailored to the realities of urban land use and based on the kinds of transportation services people want. Land use policies determine the degree of population density and thus the distribution requirements on which demands for the movement of people and their goods and services are then predicted.

Many factors can influence urban land development. Historically, transportation technology has been an influence in that it has served to delineate the possibilities and the constraints on development at any given time. Thus, in the pre-automotive era trade and industrial centers grew up first around water, and later on around rail terminal facilities. These served as urban employment centers. Housing developments for the workers were located in close proximity to fixed rail transit systems which radiated out from a core employment area. Street trolleys often served the purpose, but underground or elevated systems were subsequently provided in a few of the most densely populated areas to move people only. Meanwhile, street systems also accommodated the movement of goods by horse-drawn drayage and of additional people by horse and buggy.

The introduction of the motor vehicle and modern highways removed many restraints to urban development. Trade and industry were no longer restricted to limitations of rail and water transport and could find economic space for location away from highly developed areas. Residential development was no longer restricted to dependence on fixed rail

transit, and people's travel patterns were no longer fixed by the routes of rail transit lines.

Since the 1920s large new cities have grown up in the western and southwestern sections of the United States which reflect the impact of highway transportation mobility. Just as importantly, highway transportation has played a significant role in the process of urbanization which has taken place throughout the United States since World War II.

It is probably more accurate to describe this phenomenon as a process of suburbanization. In the past quarter century we have seen not only a steady growth in urban population but a spreading out of urban development. This phenomenon has been marked by a continuing dispersal of urban activities outside the central cities and a decline in urban population average densities. The dispersal involves not only residential land uses but commercial, industrial and recreational as well, all made possible by highway transportation.

In the two decades from 1950 to 1969 our metropolitan areas (that is, areas with central cities of 50,000 or more population) grew from about 89 million to more than 129 million population. Virtually the entire increase of 40 million persons occurred in the developing suburbs outside the 1950 boundaries of the central cities. Some central cities subsequently registered gains by annexing their adjoining suburbs.

The suburbs which had 41 percent of the metropolitan area population in 1950 today account for 55 percent. Not only does the suburban population within our metropolitan areas exceed that of the central

cities, it also is larger than all of the population of the United States outside metropolitan areas. This is not only important in transportation planning, but has economic, social, and political implications as well.

Some of our older industrial cities actually have been losing population. During the 1950s, for example, the four-county Cleveland metropolitan area showed a 25 percent gain, but the city itself lost 4 percent.

In the period from 1957 to 1964, St. Louis lost 80,000 population while its suburbs gained 300,000; Detroit lost 60,000, but its suburbs gained almost 450,000. Some major cities, such as Philadelphia, gained but only slightly. It added 20,000, while its suburbs were adding 450,000; likewise Washington D.C. increased by 20,000, but its suburbs gained 560,000.

Preliminary results from the 1970 Census indicate further losses for many central cities in the 1960s. Minneapolis, for instance, is down 50,000 from its 1960 population; Birmingham, Alabama, lost 42,000; Milwaukee, nearly 30,000; Seattle, 40,000.

As the population continues to spread out all sizes of urbanized areas have been decreasing in density. From 1950 to 1960 the average density of actual urbanized areas within the metropolitan regions declined from 5,438 persons per square mile to 3,752 persons per square mile. In the central cities the drop was from 7,788 persons per square mile to 5,349 persons per square mile.

One of the explanations for the decline in density, and one of the distinguishing and significant features about suburbanization is the fact that, as of 1960, about 85 percent of the suburban population lived in single family dwellings, 42 percent of which were built in the preceding decade. This compares with 53 percent of the central city population living in single family dwellings.

Add to this the fact that 73 percent of suburban housing was owner-occupied, compared with 47 percent in the central city, and we get persuasive evidence of the popular trend and preference.

Although Census data which would establish what has occurred in the 1960s are not yet available, it is probable that this picture of low-density, single-family, suburban residential development has not changed materially. In fact, with the rising family incomes of recent years there appears to be a tendency to larger sized lots for home-owners and to a higher proportion of families who own their own homes, thus creating lower density development.

Low-density development has been a hallmark of Los Angeles and other new cities that have grown up largely in the auto age. One of the features of these new cities is the fact that they devote 40 to 50 percent of their land area to residential use, as contrasted with about one-third of the land used for housing in older industrial cities. Less well understood in the changing pattern of suburbanization is that the outer rings of our older cities now exhibit a type of residential development similar to newer cities.

In the Philadelphia metropolitan area, for example, residential land use nearly doubled during the period from 1945 to 1960, while the number of dwelling units increased by less than 50 percent. Residential development, therefore, occurred at a density of about one-half that of 1945.

Land on the outer edges of the Philadelphia area is consumed at a rate of one acre for every eight residents. This compares closely with the newer western cities. In Los Angeles the ratio of land tc people is one acre for every 10 residents. In Tucson, Arizona, the ratio is one acre for every eight persons added to the population.

Suburbanization has attracted trade and industry as well as the population. As these activities have sought space, room for expansion, parking, and access to new or improved transportation facilities outside the central cities, their locations have been dispersed along with their employees and customers.

Retail trade in particular is closely related to the distribution and composition of the population. In view of the rising affluence of suburban consumers and their tendency to go shopping by auto, retail centers have been developing at major highway interchanges. The trend in the outward shift of retail trade is most pronounced in the largest urban areas, and was well underway a decade ago.

Thus, we note that from 1958 to 1963 in the 37 largest metropolitan areas retail sales increased an average of 5 percent in the central cities, but recorded a 45 percent increase in the suburbs. Sales actually

declined in 13 of the central cities and in 29 of the central business districts. The large sales increase in the suburbs indicates a change in the location of retail activity, since it is well in excess of the increase of population and income in the suburbs during this five-year period.

In 1958 the suburbs of these 37 metropolitan areas accounted for 40 percent of the retail sales dollars; by 1967 they had surpassed the central cities in sales.

Manufacturing shows a similar trend toward dispersal, again most evident in the large industrial areas. From 1958 to 1963, in these same 37 metropolitan areas, manufacturing employment dropped 6 percent in the central cities, while increasing 16 percent in the suburbs -- which in 1963 had 46 percent of all area manufacturing employment.

Investment in new construction of manufacturing facilities in the early 1960s was significantly higher in the suburbs than in the large central cities.

It appears that many industrial employees have been able to follow the plants to the suburbs. A recent poll found that almost half of all labor union members now live in the suburbs, and that about three-fourths of unionists under age 40 are suburbanites.

In the large metropolitan areas declines in industrial and trade employment have been offset by increased employment in the service industries, including government, finance, insurance, medicine, education,

and recreation. Nevertheless, central city employment in areas with one million or more population grew hardly at all in the period, 1948 to 1963, while employment in their suburbs nearly doubled. There are exceptions, of course, such as New York City and Washington D.C., and possibly other regional centers, with unusual growth in office employment.

The trend, however, appears to favor continued employment growth in the suburbs, which in 1960 had 35 percent of metropolitan area jobs, as against 65 percent in the central cities. In that year about 47 percent of area workers lived in the suburbs and 53 percent in the city. Nearly 20 percent of workers commuted from the suburbs into the city, and about 7 percent commuted from the city to the suburbs.

We may be heading for the time within two decades when half the workers live and work in the suburbs. Even now, Montgomery County, Maryland, one of the large suburbs adjoining Washington D.C., claims 70 percent of its work force is employed within the county.

At any rate, it would not seem accurate to characterize the suburbs in general as simply "bedroom communities" whose breadwinners are entirely dependent on the central city. Instead, it appears that suburbanization is bringing about, in many respects, a decentralization of urban living, with decreasing dependence on the downtown area for many urban activities.

Those who decry the spreading pattern of suburbanization find it easy to blame highway development for the so-called "flight to the suburbs." But the phenomenon is due to many factors, principally the choice of individuals.

The sheer increase in urban population created enormous demands for housing. Rather than translate this demand into increasingly higher density living, many individuals, because their rising incomes would permit them to do so, showed their preference for low-density, single-family, suburban living.

The United States has sufficient land to satisfy these personal preferences and to accommodate further urban land development. Even today only a little more than 1 percent of our land use is urban, compared for example with 9 or 10 percent in England.

Economic considerations encouraged development of available land on the fringes of urban areas, rather than redevelopment of already built-up areas. This development has provided employment and has included shopping, educational, cultural and recreational land uses, in addition to housing.

Furthermore, suburban development has been encouraged by public policy (which is responsive to public desires) -- not simply by the public investment in transportation facilities, but by taxation and fiscal policies to promote home ownership and broadened tax bases, by housing and urban planning and development policies, by zoning and other land use controls, and by the provision of public services such as water and sewerage service, police and fire protection.

Certainly, highway access is a requisite for the type of suburban development described. But it should be noted that the existing highway network in and around the urban areas of the United States is, and has been throughout this period of suburbanization, already extensive enough to permit access to nearly all underdeveloped land. Thus it is

possible to continue the present pattern of developing rural and urban land, thereby increasing travel demand, whether or not public programs of highway improvement are maintained. Continued suburban development therefore requires continued highway improvement, since failure to keep pace would simply compound future problems.

It may be contended by some individuals, particularly those in the urban planning field, that the trend toward dispersed, low-density development should be reversed. But as of now this does not seem at all likely to occur because this is not the way a majority of our people want to go, and at present they have the money income to express their preferences in a tangible way, as I have described earlier. Action to bring about higher density urban living would also have far-reaching socio-economic consequences and would require both full public acceptance as well as a fundamental shift in our public policy. On the other hand, greater application of the "new town" concept now receiving considerable attention would further accentuate the present trend.

In attempting to meet the travel demand posed by the land use arrangements now prevailing in our urban areas, we can identify two basic and distinct urban transportation problems:

1 -- the peak-hour congestion problem arising from commuter trips oriented to the central business district; and

2 -- the steadily increasing demand for person, goods, and service trips throughout the remainder of the day and night and throughout the rest of the urban area.

Greater use of public transportation, either by bus or rail-type facilities, or in some cases, both, in preference to private vehicles, can materially alleviate the first problem where it is in fact a real problem. In a few of our largest metropolitan areas, rapid rail transit provides an effective mode to attract commuters away from their autos. In all but a handful of our urban areas, however, the only practical answer lies in the use of buses on highways. Even in areas served by rail transit, buses now carry from nearly half to 90 percent of the transit load, and are needed to supplement the very restricted service capability of rails alone.

The low densities of most urban corridors pose difficult problems for fixed rail systems. Hence, the newer subways planned for the San Francisco and Washington D.C. areas anticipate substantial reliance on highways for the collection and distribution of passengers, by both bus and auto. Low densities generally, however, dictate the use of buses as the only practical mass transit solution.

The highway program is now and will continue to materially assist in this solution. In some cases, it is doing this by providing for exclusive or preferential use by buses of freeway lanes or streets during peak hours thus providing a rubber-tired form of rapid transport.

Acute as the peak-hour congestion problem can be, and as obvious as it is to commuters through the over-loading of highway facilities, it is necessary to keep it in perspective. It is significant, therefore,

that trips to and from the central business district comprise only about 5 to 15 percent of the total trips within an urban area, depending on the particular area, and roughly two-fifths of these trips occur during the morning and evening peak periods.

Moreover, consistent with the trend in suburban growth, the percentage of downtown trips has been declining almost everywhere. In New York, for example, CBD trips have declined absolutely as well as percentage-wise and at last count accounted for only 11 percent of all area trips. In Washington D.C., CBD trips over a seven-year period dropped from 15 to 10 percent of areawide trips, which had increased 52 percent. In Flint, Michigan, in a 16-year period, areawide trips increased over 350 percent, but CBD trips declined from 19 percent to 7 percent of the total.

Thus, the second urban transportation problem involves from 85 to 95 percent of all area trips and is growing. Because of the large numbers and wide dispersal of trip origins and destinations -- almost infinite in amount -- this second part of the urban transportation problem obviously cannot be resolved effectively by a fixed rail system. It requires a highway solution -- meaning autos, buses, and trucks -- to provide the required flexibility to satisfy this enormous range of many trips in all directions at all hours.

Today, in urban areas of 50,000 or more population within the U.S., some 93 percent of all person-trips are by auto, 5 percent are by bus, and only 2 percent are by rail transit, so that highways therefore account

for 98 percent of all trips, and 97 percent of all person-miles of travel. Incidentally, in 1968, this 97 percent translated to 675 billion person miles of travel on our urban streets and highways -- or a little more than 5,000 miles for every man, woman, and child in our urban areas.

In addition, virtually all of the movement of goods and services within urban areas is by highway vehicles using the same facility and sharing in its cost. Since trucks and service vehicles share the road with autos, the adequacy and efficiency of urban highway systems have a direct influence on the cost and quality of urban living. Even if all person movement were by any other mode than auto or bus -- such as rail, bicycle, sidewalk -- an extensive street and road network not much different from that which we now have, would still be required to move the freight, groceries, garbage, police, fire, medical aid, and service equipment to maintain life and its amenities.

Continuation of low-density, dispersed development will create enormous additional demands for highway transportation, simply because low density and the wide dispersal of origins and destinations and purposes of trips are overwhelmingly dependent on the auto, bus, and truck, with their flexibility to permit personalized routings and scheduling combinations. Realistically, these needs cannot be accommodated to any substantial degree by public transportation, although public transportation such as buses must be provided to serve the special needs of those who for a variety of reasons do not use autos.

In the next 15 years, our U.S. metropolitan areas anticipate a population increase of over 30 percent. This increase coupled with continued dispersal of urban activities spells an increase in highway travel of at least 50 percent. The rising demand for highway transportation will occur generally in the new urban, or suburban, areas, and to a lesser degree -- perhaps even a decreasing degree -- to the downtown areas. It indicates the need for a high-level program of highway improvement, concentrating on the need for freeways and high-capacity arterial routes in the growing, outlying sections of urban areas.

We in the highway field are the first to wish for some easy relief from our heavy transportation load. But in view of the patterns of urban growth and land use in the United States, and the desires of our people -- so clearly and forcefully expressed in the statistical trends stated herein -- there is no apparent ready substitute for highway transportation in fulfilling many of the great variety of services performed by highways.

If this assessment of urban mobility in the United States is accurate, then the solution to problems arising from our use of highway transportation, such as air pollution in particular, lies not in the substitution of some other impractical and often unworkable mode, but rather in bringing about needed improvements in highway transportation. In the case of harmful motor vehicle emissions, technology can and must provide an acceptable solution -- and government is making this plain to industry.

To sum up, urban growth in the United States has been characterized for some time by low-density residential development and dispersal of many urban activities. This pattern of growth is responsive to the preferences of many individuals. It is made possible by highway transportation and is heavily dependent upon it.

If this pattern of urban development is to continue, and if the viability of central cities is to be maintained, transportation programs must be directed toward two principal aims: first, to upgrade public mass transit -- in most cases, bus transit -- in order to relieve the peak-hour commuter and downtown congestion problem; and second, to increase the efficiency of the highway plant that will be serving the suburban and exurban areas surrounding the city.