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Highway Planning and Urban Development

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CHANGING LAND-USE PATTERNS AS A BASIS FOR LONG-RANGE HIGHWAY PLANNING

Homer Hoyt, Homer Hoyt Associates

LONG-RANGE highway planning must take into account shifts in residential, industrial and commercial land uses that change the direction of traffic flows. These changing urban patterns have themselves been set in motion by the automobile.

Prior to 1910, most of the city dwellers in the United States lived within a half mile of mass transportation lines, which radiated from a central core containing the offices, large retail stores, factories, warehouses and theaters. The daily movement from home to work and the shopping trips took place along fixed tracks. Factories had to be located near the focus of transportation lines to obtain workers who had no independent means of transportation. Central department and speciality stores drew most of the trade in clothing, shoes, furniture and other fashion goods lines from every part of the city.

The outward movement from the center of the city began as early as the 1850's in New York and Chicago when railroads began to offer commuting services and suburban towns grew up around stations. As the urban population grew rapidly during the second half of the 19th century, horse car lines operating at 4 to 6 mi. an hr. were succeeded by cable cars travelling at 12 mi. an hr. in a few cities, elevated lines in New York beginning in 1878 and in Chicago starting in 1890, electric surface cars which were in their hey day from 1895 to 1910, subways in New York after 1904, and finally subways in the central business districts of Boston, Philadelphia and Chicago. In the largest cities apartments were built as in New York, Chicago and Boston, or row houses as in Philadelphia and Baltimore, so that an aggregation of a million or more persons could live in the metropolis and still go to central places of employment, shopping and amusement within an hour's travel time each way.

The automobile, which created the problems we are discussing,

was the chief agent in causing the breakup of the old urban pattern and the dispersal of the urban population from the center to the periphery. The increase in the number of registered motor vehicles from a few thousand in 1910 to 30 million by 1929 gave nearly every family its own private mode of transportation, which enabled everyone to reach the vacant areas beyond walking distance from fixed transit routes.

The revolution in living habits did not take place immediately after the ownership of automobiles became almost universal. Families still preferred to live within the limits of the central cities, where there were paved streets, sewers, water, electric lights and nearby stores and street cars. To move into the suburban fringe then meant to venture on unimproved dirt roads, which were either axle deep in mud or clouds of dust in the spring and summer and frozen in rough, jagged ruts or covered with deep snow in the winter. It meant living without modern utilities, indoor running water and flush toilets. Transportation to rural schools was slow and difficult; stores and churches were remote and neighbors were far away.

Suddenly this scene changed. A network of concrete roads on the fringe of cities paid for by the State or County and not charged as an assessment against the property, made easily accessible not only the flat vacant prairies between the spokes of the transportation wheel, but also hilly areas, too steep to negotiate in early model automobiles on unpaved roads. Septic tanks and power driven pumps gave the suburban home all the modern utilities of the city. Radio and finally television brought programs of entertainment as well to the suburban as to the central city home. The suburban residential areas could not only now match most of the advantages of the central city, but they could offer attractions which the older areas could not meet. There was more room; yard space for children, parking or garage space for the family car and light and air in every room of the house. The new residential developments on the fringe of cities, which grew rapidly after 1935, also had better site plans, since the builder usually bought large tracts which could be subdivided on a model pattern offering wide lots and curving streets. F. H. A. financing methods encouraged the developer to acquire farms or large vacant tracts rather than scattered lots, because he could mark up the land value from that of a farm to urban lots and thereby create his equity. The rush to the suburbs gained momentum. The more families who left the central areas for new suburbs, the fewer of the older residents were left within the city, and the more incentive there was to move to the fringe areas where their friends were living and sending their children to the new schools. The physical deterioration of the middle aged residential sections, the in-migration of families with lower incomes and of different race or social standards accelerated the

outflow. Cities like New York, Chicago, Philadelphia, Boston or Baltimore, which had reached metropolitan proportions before the automobile, witnessed the rise of satellite suburbs around their compact, central core. Cities which grew from small cities to great metropolitan centers during the automobile age, such as Los Angeles, Detroit and Miami developed a diffuse form in which residential settlement was scattered over far flung areas.

Not only extensive communities of single family homes, but after Colonial Village was constructed in Arlington County, Virginia in 1934, apartment buildings which once were confined to central city areas along mass transit routes, were built by the thousands in suburban areas under the stimulus of F. H. A. financing.

The rate of increase of the population of the suburban fringe has been so great since 1930, and particularly since 1940, that soon the majority of many metropolitan populations will be living beyond the mass transportation lines. In the Washington, D. C. metropolitan area, the population of the District increased from 278,718 in 1900 to 802,178 in 1950, or nearly 200 percent and yet in the same period the population of Arlington, Montgomery, Prince Georges Counties and Alexandria shot up from approximately 100,000 to 661,000. By 1958 there will be more people living outside the District than inside. In the Chicago metropolitan area, three fourths of the population of the four county area, (Cook, Lake, Du Page, in Illinois and Lake in Indiana) lived within 8 miles of the central business district in 1900, but today only half of the metropolitan population lives within the 8 mile circuit. The Minneapolis and St. Paul central cities gained only 7 percent in population from 1940 to 1950, but their suburbs increased by 100 percent in numbers in the same period. This same rapid suburban growth characterized every metropolitan area in the nation in the last two decades.

Industrial Decentralization

Thousands of manufacturers who were once confined to central city areas because of the necessity of being within walking or street car distance from their labor supply and of being within horse and wagon distance from central freight terminals, have gained great advantages in operating efficiency by following the residential movement to the suburban fringe. Since workers all have their own cars and can drive to and from work easier on the periphery of cities than in congested central areas, since belt line railroads can move freight cars as easily from fringe as from central locations and since trucks can move goods quickly from outlying factories, most factories on the edge of the city now possess

the same transportation advantages as the central factory. The peripheral factories enjoy economies not possessed by those at the center. The cheaper land permits the construction of one-story plants through which manufacturing operations can flow in a continuous stream without being broken up on each floor level. In these single story plants heavy machinery can be installed on the ground; railroad cars and trucks can enter the plant to load or unload. There is no expense for installing and operating elevators. The one-story plant with ample yard space can be adjusted more easily to the requirements of growth, as it can be expanded on any side. There is freedom from local street traffic congestion and there is room for parking inside the factory property.

Not only did large industries like Ford in Detroit, General Electric, General Motors and others build new plants on the suburban fringe, but clusters of small industries banded together in industrial districts such as the Clearing District in Chicago, on the edge of cities. New defense plants are now being erected throughout the United States on large vacant tracts on the fringe of cities rather than at the center.

Commercial Decentralization

Outlying shopping centers grew up at street car intersections, subway and suburban railroad stations during the mass transportation era. Commercial centers dependent upon shoppers driving their own cars have been developed in many cities in the past few years. Many of these new commercial centers offer only local convenience goods and contain only a supermarket, drug store, hardware store, beauty parlor and barber shop, with some of the larger ones including variety of five-and-ten-cent stores. They all provide free parking spaces for their customers, often on the basis of three sq. ft. of parking for each sq. ft. of selling area. Large regional centers with department stores as well as food, drug and local convenience stores have been built in Arlington County, Virginia; in Framingham near Boston; Seattle; Raleigh; and other cities. Huge shopping centers of 80 to 100 acres with parking for 8,000 to 10,000 cars have been planned by Marshall Field & Company for Skokie, north of Chicago and by the J. L. Hudson Company in Detroit. The developers of all these centers have bought land on the fringe of cities where it was cheap enough to permit devoting three-fourths of the area to free parking.

Office Buildings

Office buildings providing space for lawyers, brokers, display space and management headquarters, where there is need to be near

the central market or there is necessity of having face to face contacts with officials of other companies, will continue to be located in central areas. Some insurance companies locate at the focus of mass transit lines so they can draw workers from all parts of the metropolitan area. Many companies that are internally self-sufficient are building office buildings in suburbs close to the homes of workers. The recently completed Prudential regional office building in Houston is an example of this trend.

EFFECT OF CHANGED LAND-USE PATTERN UPON HIGHWAY PLANNING

What has been the effect of these recent trends in residential, industrial and commercial land uses upon traffic and highway planning? The basic fact in the change from a predominantly mass transportation era to the automobile age is that a person in a private automobile takes up 15 times as much space as a person in a mass transportation vehicle. A shopper on foot takes up 3 sq. ft. of space - a parked car requires 300 sq. ft. or 100 times as much area. Traffic congestion problems have become acute in the past six years because the number of motor vehicles has increased from 31 million to 52 million in that period. Even in the most advanced system of express highways in the United States, - those encircling Manhattan, Brooklyn and crossing Long Island into Westchester County and Connecticut - there are Sunday evening blockades extending for miles. When traffic flows freely on these expressways, it is impossible however, to park all the cars near working or shopping places in Manhattan. It must be realized that it would be impossible to transact the present volume of retail business in New York, Chicago or Washington if everyone came in his own automobile. The $400,000,000 or $500,000,000 volume of retail sales in Washington would require, on the basis of $10,000 sales per car space, parking for 40,000 or 50,000 cars, which would mean 15,000,000 sq. ft. of parking area or 340 acres in multiple story garages. The cost of providing this would exceed $40 million and even if garages of this great capacity were built they would either be located too far away for the shopper to walk or else create intolerable congestion. Accordingly, the central shopping districts must still depend upon mass transportation to bring them most of their customers and must still depend also on the redevelopment of central blighted areas within walking distance or a short bus ride from the downtown stores.

Movement to Work

With a higher percentage of workers living beyond the mass transit lines, the thousands of suburban dwellers going to work in central areas of cities like New York, Chicago or Philadelphia and

Boston, drive their cars to suburban railroad stations or to subway stations where the car is parked or taken home by their wives. This movement of automobiles avoids entering congested traffic areas. In large metropolitan cities like Detroit and Los Angeles where there are no rapid transit lines unimpeded by surface traffic, there is a tremendous movement of automobiles to both central business districts and to belts of factories on the suburban fringe. Traffic movements crisscrossing the entire city, where workers living in one section travel to the opposite end of the city and vice versa are caused by the difficulty if not impossibility of securing homes near work as a result of the tight housing market. A tenant under rent control enjoys a monthly bonus he will not give up to assume higher monthly payments for a home near his work. The owner of a house purchased a few years ago at $10,000 could not have sold it for $20,000 in order to buy an equivalent house near his work for $20,000 without paying a capital gains tax on a "profit" of $10,000, until the income tax law was changed to take effect this year.

Traffic congestion caused by the movement of workers between home and places of employment are often even greater in small or medium sized cities than in New York or Chicago because in these smaller cities there are usually no rapid transit lines and everyone endeavors to use his car to go to work.

In larger cities the flow of auto traffic and the surface mass transit movements are slowed down by parking cars on the streets, which is allowed by some cities in old apartment and tenement areas where the present need for parking garages was not anticipated. The percentage of automobile ownership is much lower in Manhattan than in the suburbs for families of the same income level, because of the high cost of garages and the difficulty of parking. The urge to have space for the automobile is in itself one of the drives causing families to go to the suburbs.

The movement of industries to locations on the periphery has lessened the congestion of traffic moving towards the center. There is a traffic flow running counter to the inbound flow consisting of workers in older central areas driving to factories in the suburbs. This is also true of office buildings like the Pentagon in Arlington County, Virginia, where there is a great stream of traffic moving counter to the inflow to Washington, D. C. created by that part of the 30,000 Pentagon workers who live in the District.

The end of the afternoon shift in factories on the edge of the city creates traffic congestion that is usually past its peak before the workers from the city driving to their homes reach the area.

Trucks

The outward movement of industry relying to a greater and greater extent upon trucks, has created another type of congestion. While trucks are fewer in numbers than passenger cars, they are on the highways an average of eight hours a day compared with two hours a day for the average automobile. Their great bulk, impairing visibility of motorists is a further traffic obstacle. Trucks, however, have become indispensible to factory operations upon which the economic life of most northeastern cities depends and facilities to improve the flow of trucking is therefore a most important phase of highway planning. One recent development is the rise of specialized trucking terminals where truckloads are distributed and reassembled and which reduces the number of trucks on the streets engaged in local delivery or pickup services and which takes most trucks off the streets for loading and unloading.

Commercial Centers

Shoppers, who prior to 1910 used mass transportation almost entirely now drive their cars to an ever increasing extent to the stores. This is particularly true in cities built largely during the automobile age. In Los Angeles 44 percent of department store customers come in cars compared with 20 percent for San Francisco. In Milwaukee 59 percent of the shoppers in the downtown area used their own automobiles. The new commercial centers with automobile parking will increase the proportion of families using cars in shopping still more. Some large centers will add movements of from 2,000 to 25,000 cars to the traffic load of the adjacent highways. The building of overpasses may be necessary to permit entrance to the centers across a stream of traffic. In every case highways will have to be adequate to handle the increased volume. The fact that the peak of the shopping traffic will either be during afternoon or evening hours, before or after the peak of the traffic flow between home and work has a most important bearing on the traffic problem. Also the movement of shoppers from suburban homes to suburban shopping centers will lessen the movement of shoppers from the suburbs to central areas.

Future Highway Planning

In view of the changes that have taken place and that are taking place in the urban and suburban pattern of land uses, what appear to be the outstanding needs in highway planning?

First, the need of circumferential or belt express highways encircling the outer rim of the central city appears to be of major

importance. These highways would enable through traffic to avoid the central city, which would lessen congestion there. The belt expressways would enable workers to move from their homes in any part of the city to factories on the periphery. They would also facilitate the movement of shoppers to new suburban shopping and office centers. These highways would enable residents of any suburban area to visit their friends on the other side of the city, or it would enable motorists in central areas to reach other sections of the city quickly by taking the nearest radial highway to the belt highway. An inner cordon for circulating traffic is also desirable.

Second, most cities, particularly Chicago, need more radial expressways on which express busses could operate to furnish fast mass transportation.

Third, more central parking garages are of course needed, not to enable everyone to drive his or her own automobile to work or shop instead of using a mass transportation vehicle, but to furnish parking areas for out of town shoppers, or for those requiring a car in their work, or for shoppers coming when mass transit vehicles are operating infrequently.

Fourth, redevelopment of central blighted areas would bring more families within walking distances of central offices and factories and reduce the congestion on both mass transit and highway facilities.

Fifth, a national system of express highways like the Pennsylvania Turnpike, the New Jersey Turnpike, should link the nation from coast to coast. Economy of factory operations, convenience to the owners of cars who pay gasoline taxes, and military necessity would dictate that at least four such highways, should cross the nation from east to west and five from north to south.

URBAN REDEVELOPMENT AND HIGHWAY PLANNING

Edmund N. Bacon, Executive Director
Philadelphia City Planning Commission

NEW possibilities for highway development in cities are being opened up through the growing activity in urban redevelopment now taking place throughout the country. For the first time there is available, through the powers granted to redevelopment authorities by many states, the means for assembling land in blighted areas and controlling its use so as to obtain rights-of-way for new highways and to secure the rational development of adjacent land. This had the double advantage of making possible intelligent planning of access to the new highway from bordering properties, and of assuring to the community realization of the full benefits created by the new highway through planned development of adjacent areas.

I hasten to emphasize that the primary purpose of redevelopment is not to create highways, and that highway improvements are a byproduct of redevelopment possible only where highway needs and blighted areas coincide. However, they may be a very significant byproduct, as our experience in Philadelphia has shown.

I also stress at the outset that the benefits I am discussing are possible only if the redevelopment program and the highway program have a very strong common planning base. Normally this type of coordination can be supplied only by a competent, well staffed, technical city planning commission that has the respect of, and close working relationship with both the redevelopment authority and the highway planning and building agencies. Without this there is the danger that the tremendous sums that will be spent by both groups will not be well utilized, and that physical opportunities for rational highway development will be lost for all time.

The pattern which we have found in Philadelphia, which I believe is common to most cities, is that of the central business district and the principal secondary business centers being bordered by a blighted mixture of housing and commercial structures. And it is frequently these business areas that are most in need of highway access. The program logically becomes that of clearing the blighted area, and in the process of redistributing the assembled land, providing the right-of-way for new or widened streets.

The first area which we considered was the Germantown Business

Center, an important local district seriously inhibited from development by lack of space in which to expand, lack of parking facilities, and of adequate highway access. The proposals of the planning commission had long called for a highway widening, connecting with major arteries, and paralleling Chelten Avenue, the principal business street, one block to the north, but no action was foreseeable before 1955.

In cooperation with the Germantown Businessmen's Association a plan was worked out for acquisition by the Redevelopment Authority of the blighted area between the rear of the Chelten Avenue properties and the street proposed to be widened. The area needed for the widened highway would be turned over to the city, and adjacent to it large sites suitable for major commercial enterprises would be provided. The center of the block would be developed with parking facilities, probably by the parking authority, serving both the new and existing establishments. This would make possible the design of an efficient center incorporating many of the principles of the most advanced new regional shopping centers. It would produce much greater benefits to the community than would result if the fragments of small parcels left over after condemnation for high way widening remained in individual ownership. Since the redevelopment authority would control the design of the adjacent commercial development, it can see to it that the approaches to the parking areas, truck loading facilities, etc., are planned in accordance with modern traffic principles.

A second most important proposal is the Lombard Redevelopment Project. This covers an area about two blocks wide extending 2½ mi. between the Delaware and Schuylkill rivers, bordering the central business district on the south. In this area some of the worst housing in the city is located. Plans for slum clearance here date back to the early thirties. The planning commission saw the possibility of combining clearance projects with the provision of added right-of-way for a much-needed new traffic artery, corresponding with the recently completed Vine Street widening on the north.

Detailed studies showed that, if the area were assembled into one ownership, and the many small streets and alleys that crisscrossed the section were vacated and incorporated into the redevelopment sites, the area of these streets would just about equal the area required for the Lombard Street widening.

The net result of the operation would be that the amount of land used for streets would be the same as before, but in the reshuffling process made possible by redevelopment, a fine new highway would be provided and at the same time excellent new sites for

new developments would be created adjacent to it. While much of the area should be used for public housing to help rehouse those now in the area, the project is extensive enough, and so located as to be suitable for privately built apartments, parking facilities and commercial developments. In the long run the project should prove to be of great direct economic benefit to the city, in addition to removing the detrimental effect of a centrally located blighted area, and resulting in the accomplishment of a highway long thought to be just a dream.

Through the planning controls provided in the Pennsylvania Urban Redevelopment Law it will be possible to secure development of all of the adjacent property in such a way that there is no vehicular access at all to Lombard Street, all entrances and exits being from the cross streets. Thus we can develop a highway with no parking and no stopping through a densely built up area, simply by national land use planning. In this way the full traffic benefit of the widening will be realized, and far greater carrying capacity per square foot accomplished than would be possible under simple widening as normally practiced. Since Lombard Street is to be primarily a distributer artery, expressway type of design would not be logical here.

The realization of projects such as the Lombard Redevelopment Proposal is made possible by the federal appropriation of $500,000,000 for land write down in clearance areas under the provision of the National Housing Act of 1949. The federal subsidy must be matched, one local dollar to two federal, but city improvements which benefit redevelopment projects may be credited toward the local contribution. Our plans are not yet sufficiently developed to offer concrete experience in the financing arrangements for acquisition of highway right-of-way. The bookkeeping operations are quite complicated, and there is little precedent available for guidance. It would seem evident, however, that a coordinated program such as I have described would produce far greater value per dollar spent by the city than would a conventional widening.

I want to stress the point that, although the federal government's participation in redevelopment is limited to those areas in which housing is the predominant use before or after clearance, many of the state acts authorize redevelopment authorities to proceed where housing is not the predominant use in either case. This makes possible projects such as the Germantown proposal, through purely local action, independent of Washington, either on a self-liquidating basis or with state of Local subsidy.

Even without subsidy, the economic benefits of this procedure are evident. If the city pays its full share on a square foot ba-

sis for the additional right-of-way it received from the redevelopment authority this would normally be less than the cost of condemnation of the front strips of properties, the removal or partial removal of structures which reduce the value of the remainder to the point where the city must pay almost the full value for the entire parcel. Also, through the land assembly process, the redevelopment authority should realize on the new value given to the adjacent property by the highway improvement, in its sale or lease of the assembled land to the new user.

Finally, I want again to state that this type of approach is possible only through comprehensive planning. Redevelopment and housing authorities naturally are primarily interested in property development, and could not normally be expected by themselves to conceive projects in relation to a comprehensive highway system. The highway agencies do not normally think in terms of slum clearance.

You, who are principally interested in highway development, will in the long run I think, most effectively reach your objective if you help to build up an effective, well staffed, official planning commission, encourage it to see highway development in relation to the total functioning complex of the city, and then work with it closely.

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