

and the Wilbur Cross Parkway. While the parkway was not opened in Orange until 1942, there was a striking increase in US 1 traffic the preceding two years. This sharp increase, which put the route above the trend, was maintained after the completion of the parkway and is reflected in the 1946 and 1947 post-war traffic. It will be noted, in contrast to the previous figure, that the 1947 traffic exceeds the value for 1941.

If it is assumed that the amount of traffic above the trend line is "generated" by the superior facility, Table 6 gives the values and percentages.

It will be seen that at the Orange location there is a great deal of consistency between the values before and after the war.

It would appear from the data we have for the major routes in Greenwich and Orange that there can be a generation of "new" traffic because of the provision of superior facilities. There is a possibility that the generated traffic may be as great as 20 or 25 percent of the volume which might be estimated if the "new" traffic is ignored. There is a possibility, too,

however, that this additional increment may not be continuous over the years. The Greenwich situation brings this out.

In concluding this discussion I should like to point out that it was shown by the percentages of diversion obtained on the South Meadows Expressway that there is a trend toward greater relative usage for at least two years after the completion of that facility. Furthermore, Figures 8 and 9 show a proportionately greater use of the parkway and a lesser use of US 1 since the parkway was completed all the way to New Haven in 1942. For example, in Orange—as illustrated by Figure 9—the comparative values (average daily traffic) on the parkway and US 1 were as shown in Table 7.

We shall follow with interest future trends on these routes. It will be necessary to correlate, with our studies of traffic volumes, detailed information on the trips making up the traffic. Change in the character of traffic—more or less long trips or important new traffic generators—are factors that might be affecting the distribution between the routes.

## FRINGE PARKING IN RELATION TO TRAFFIC CONGESTION

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### SYNOPSIS

Fringe parking facilities are shown to possess powerful potentialities for performing desirable functions in the preservation to cities of their original reasons for being, and that fundamentally, accessibility is what cities have chiefly lost through all forms of traffic congestion. The problem is thus identified as an accessibility problem, not a parking problem, and accessibility not just to the private passenger car, but to people by the most feasible and least traffic-congesting means of transportation.

Fringe parking, therefore, must be made to function successfully in solving the accessibility problem. The three essential means of controlling the functioning of fringe parking facilities are described, also both the temporary and permanent places these facilities can take in the retrieving and preservation to cities of their valuable and necessary functions. The fundamental requirement is high-lighted of developing a well-conceived and complete pattern of fringe parking facilities, preferably by a parking authority or other specifically designated municipal agency, and of exercising the right of eminent domain when need be, to obtain properly situated fringe facility sites.

Freeing of the downtown traffic flow in the big city is foreseen as off-street parking is provided and curb parking removed, and as a proper pattern of fringe parking facilities keeps the all-day worker parker and other long-time parkers out of the downtown area. An accompanying boon to transit is envisaged, because of more short-haul business within the fringe, and less non-profit or low-profit long haul business outside of it.

Thus it is anticipated a full community of interests will be benefited as fringe parking takes its place alongside downtown off-street parking, to bring back accessibility to our cities, allowing them to function as they were intended to do, and stabilizing their positions as centers of needed concentrations which cannot be decentralized, because there is no true substitute for them in the American social and economic cultural pattern.

Do we all agree on what fringe parking is? The encyclopedia might define it like this,—a parking facility for motor vehicles (commonly a parking lot, sometimes a parking garage, sometimes simply parking space on the street at the curb) approximately at the edge or fringe or perimeter of the downtown business and shopping district in a city. But, like the present uncertain length of the feminine skirt, there are narrow fringes and wide fringes, so that fringe parking is often carried well out beyond the edge of the business and shopping center. For example, at the Long Island City end of the Queensboro Bridge, or way out at 69th Street in Philadelphia. In these last two instances mass transportation facilities enter the picture most effectively, to complete a fast trip for the fringe parker into the downtown area.

When considering a particular type of urban parking problem, it is wise not to mix up cities of all sizes, nor objectives of various magnitudes. Urban parking problems are definitely community problems, so that the larger the community, the bigger and more complex the problem becomes. However, in the case of fringe parking, it seems fair enough to say that fringe or perimeter parking is thought about most particularly in relation to the big city, where there is usually a well-developed pattern of mass transportation facilities, as well as great concentration of service industries in a central business, shopping, hotel, theatre, and restaurant district or districts.

Certainly there should be little difficulty in working out the parking requirements of a small city, where objectives are easy to see, and solutions not too troublesome in respect to the selection of suitable sites for facilities, at reasonable cost and distance from parking demand generators. But the big city is different. It is extremely important here that the discernible advantages of fringe or any other kind of parking be carefully examined, especially in their functional aspects, before full reliance is placed upon them to accomplish desired purposes. And just what are these purposes?

Did you ever ask yourself why we have cities anyway? If they create all these parking problems for us, if we are greatly concerned about decentralization and so on,—why not chuck the whole thing, side-step the parking problem, and spread out over the landscape. Well, to be perfectly truthful about it, we need our cities, especially the big ones, because they do things for us, they function in very desirable ways. Let us look over these functions of the big city, since they are essential to understand in dealing with the urban parking problem, and to preserve for now and the future. Here they are:

1. The larger cities function to provide the opportunity for sufficient concentration of service industries and activities, and permit the specialization necessary to satisfy the demands of their own populations, and those living in the adjacent areas.

2. Commercial and retail services in large cities, usually segregated in different sections, offer opportunities not found in smaller communities for satisfactory dealing, with assurance of ample ranges of price, quality, material and design.

3. Large cities and their environs, because of population concentration, function for the development of manufacturing.

4. On the social side, big cities function to provide unrivaled advantages in culture, music, art and general entertainment.

5. On the financial side, the big city functions to furnish banking and other financial institutions, exchanges and the like.

6. For the professions the city offers large fields of endeavor, and functions to furnish the required concentration of professional services.

Did you notice one word standing out prominently in this recital of a big city's functions, the one most desirable offering the city makes. "Concentration" is the word, concentration of services, of population, of professions, of music, of art, of commercial and retail establishments, of financial institutions, and so on. That is something to remember as we turn our attention toward the problem of highway and street traffic concen-

tration, then of traffic congestion in a large city. These phenomena have grown upon us, while cities have been functioning as they were intended to do, furnishing the desirable concentrations they were designed for.

The second thing to remember is that we shall need to approach and deal with the undesirable congestion problem in such a way as to preserve the necessary functioning of our big cities, as providers of the sufficient concentrations of services required by each entire metropolitan area in which a city functions. Now then we are in the proper frame of mind to look at the fundamental features of the parking problem, especially to find out where so-called fringe parking fits in best.

Fringe parking facilities, all parking facilities, possess powerful potentialities for performing desirable functions in the preserva-

TABLE 1  
TRIP PURPOSES AND TIME PARKED BY USERS  
OF LOT  
(Weekday 7:30 a.m.-6:30 p.m.)

Purpose	Number of Parkers	Average Time Parked
Work . . . . .	228	8 hrs. 20 min.
Business . . . . .	5	4 hrs. 30 min.
Shopping . . . . .	22	4 hrs. 30 min.
School . . . . .	6	7 hrs. 30 min.
Recreation . . . . .	6	4 hrs. 20 min.
Unknown . . . . .	2	10 hrs. 20 min.
Total	269	

tion to cities of their original reasons for being. And, were we asked to put in a word what most needs restoring to cities in connection with this business of preserving their valuable functions, there should be a unanimous choice of accessibility, since that is what our cities have chiefly lost through all forms of traffic congestion. So our real problem then is an accessibility problem, accessibility not just to private passenger cars, but to people by the most feasible and least traffic-congesting means of transportation. We should keep clearly in mind that the fringe parking facilities must be made to function successfully in solving the accessibility problem.

At this point we usually begin leaning. After the Revolution we did a lot of leaning on private enterprise where the building of highways was involved, and now again some cities have tried their hardest to lean heavily on private enterprise to recover their accessibility.

There has been a special lot of leaning on transit companies, not only for actual transportation services, but also for the provision and operation of fringe parking facilities. This has been made easier, because the transit people themselves became interested in fringe parking partially in self-defense against mounting downtown traffic congestion.

There is no logical reason, except from the standpoint of expediency, to expect a transit company to furnish and operate a fringe lot, in addition to the auxiliary mass transportation required. But whether or not a fringe facility is provided and operated by transit, it should be recognized and located as a unit in the whole pattern of fringe parking for a city, if it is finally to deliver its full potentialities. Let us, therefore, examine the functional possibilities of fringe parking in winning back the accessibility of a city. A case of interest in this connection is worth relating here.

A transit company in order to test out the fringe lot idea, and discover if possible how much such facilities might keep parkers' cars off downtown streets, did a fine job of equipping a fair sized lot, and establishing a conveniently scheduled, well conditioned loop bus service into the business and shopping district. The lot became popular quickly, soon being filled to capacity all day long, principally with all-day worker parkers.

Subsequently, after this lot had been in operation about eight months, a study of its functioning was conducted. The results of the study are summarized in Table 1. The lot has a capacity of slightly over 200 cars, and since there were 269 users on the day of the study, the turn-over of space was 1.35.

The interviewing of parkers on this transit company's lot brought out very clearly its functional characteristics in relation to the relief of downtown traffic congestion. Analysis of the data obtained from respondents showed that 85 percent of them were all-day-worker-parkers; it also showed that 34 percent of the users had not previously driven their cars downtown, that is before the lot was opened. And still more interestingly it was evident that 84 percent of those who had not previously driven to town continued to be all-day worker-parkers.

As the factors chiefly responsible for the observed performance or functioning of the transit company's lot, these can be cited:

1. Its distance of somewhat less than a mile from the center of the central business and shopping district;

2. The low fee of only 25 cents charged for all-day parking, plus a bus ride both ways, downtown and back;

3. The early opening of the lot, long before shoppers would be coming downtown, allowing the preponderance of all-day parkers among the users to block out the shopper parker.

Very plainly from the example of the fringe parking facility just discussed, the three most effective means of controlling the functioning of this facility, or of any parking facility, are:

1. Its location in relation to the destinations of the parkers;

2. The schedule of parking rates charged;

3. And the hours of operation of the facility.

These may seem self-apparent, but they are nevertheless well to remember, because the positive, definite approach only is going to solve the parking or accessibility problem of the big city.

It is conceivable that fringe parking facilities may be made to function under present conditions either for permanent or temporary purposes. Unquestionably in our large cities the most desirable approach, but unfortunately the most difficult of accomplishment, toward the solution of the urban accessibility problem, is the provision of off-street parking facilities in the central city, which will permit the short-time parker (the shopper, the salesman, the theatre-goer, the buyer), who is able and willing to pay for space in such facilities, an opportunity to use his preferred means of transportation by private automobile into the shopping and business district. Then when the second step follows, removing curb-parking as off-street facilities appear, the real boost will come to urban accessibility.

It may be feasible, however, to provide a temporary expedient in the form of fringe parking, that will function to take some of the short-time shopper or business parkers out of downtown. To make these facilities perform that way to the greatest possible extent, they should be located close in, parking rates plus the bus or street-car ride downtown and back should be somewhat lower than it would cost to park off-street for two or three hours in the central city, and of essential importance—the fringe facility must be reached by regular or special mass transportation service running

frequently, probably on a headway of not over five minutes during the business and shopping day. However, no effort should be spared in a big city to provide off-street facilities downtown as quickly as may be, and to remove curb-parking.

Turning now to the requirements, or shall we say the aspirations of the all-day worker-parker in the big city, we confront the well known American urge to bring the private car into action every morning for the trip to the job. But looking at the worker-parker situation realistically, it becomes evident that he does not rate all the concern accorded the shopper, the theatre-goer, the customer in general of the service industries downtown. As a rule the worker-parker does not want to pay what it costs to park his car all day in the central city, where the parking facility operator makes more money from the multiple use of space at higher rates per hour by the short-time parker. Especially since the O.P.A. went out of business the tendency has been for the downtown parking facility operator to adopt rate schedules designed to discourage the use of space by all-day parkers unless they are willing to pay enough for it, but instead to give the operator the higher return from turnover of space among short-time parkers.

So the all-day worker-parker may decide to do one of two things, either to leave his car home and travel by mass transportation, or to drive downtown as far as he can, until traffic becomes too dense, or parking rates mount too high, and then to finish his trip on street-car, bus, or subway. Here fringe parking really can contribute and on a permanent basis. In fact the discernible possibilities of causing a complete pattern of fringe parking facilities to function effectually as accessibility retrievers for the big city, ought to be very attractive for the city and its citizens, for transit, and for the all-day worker-parker—for the community as a whole, because remember the accessibility problem in a community problem.

What is first needed is a complete pattern of fringe parking facilities surrounding the congested section of the city, which will tend to eliminate as much as possible the crossing of the central city by users of the fringe facilities in reaching their objectives. This will, furthermore, allow transit to operate most efficiently and economically within the fringe of facilities being served. It is to be hoped

there will be a parking authority or other designated municipal agency to lay out the complete pattern of fringe facilities. It is to be hoped too that the city or designated agency could by the right of eminent domain take the properly located fringe facility sites if necessary, equip them, lease them thus equipped, or lease the sites themselves without equipment to private operators; not necessarily leaning on transit for this. Another approach would be to have private enterprise furnish sites, equipment, and operation, so long as the right pattern of fringe facilities is obtained.

One final word about transit, since big cities are dependent upon transit for their basic means of transportation. Transit vehicles, together with all downtown traffic will flow more freely, as off-street parking is provided and curb parking removed. But there appear to be several additional solid benefits

coming to transit, when a proper pattern of fringe parking is installed. First as the fringe facilities function to keep the cars of workers and other long-time parkers out of the downtown area, and secondly, because of advantages accruing to transit from more short-haul business within the fringe, and less nonprofit or low-profit long-haul business outside of it, as greater numbers of all-day parkers drive to fringe facilities, and ride transit facilities from there in.

Then it is that fringe parking will fully take its place alongside of downtown off-street parking, to bring back accessibility to our cities, letting them function as they were intended to do, and stabilizing their position as centers of needed concentrations which cannot be decentralized, because there is no true substitute for them in the American social and economic cultural pattern.

## APPLICATION OF METROPOLITAN ORIGIN-DESTINATION SURVEYS TO TRANSIT PLANNING

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### SYNOPSIS

Transit officials have not generally taken advantage of the data concerning travel habits of all persons within a metropolitan area which have been revealed through origin and destination surveys. To utilize these data desire line charts are prepared for transit passengers. These indicate whether or not existing routes best serve the passengers.

The use of O-D data to test parts of the transit patterns of Nashville and San Francisco is outlined, and an example is given showing the manner in which Cincinnati O-D survey data were applied to determine the type and amount of express or rapid transit service from outer areas to the central business district. The applicability of O-D data to central business district transit routing, and to through routing is discussed, and their limitations for use in studies of line characteristics are pointed out.

The transit official charged with the responsibility of planning and rehabilitating his system to serve the community best is vitally concerned with the travel habits of all persons within the area served by his system. Since the metropolitan origin-destination survey reveals the travel habits of a representative sample of all persons within the metropolitan area, the data are as important to the transit planner as to the highway planner. In several

cities where origin-destination surveys have been conducted, transit officials have not availed themselves of the comprehensive data of the O-D survey since they considered it merely as another highway survey.

The purpose of this paper is to indicate in a general way several applications of the metropolitan origin-destination survey to transit planning. While there are many applications, those enumerated are several which