Mobility as a Measure of Neighborhood

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This project is devoted to a study of the effect of freeway location on the configuration and continuity of neighborhood; the terms "configuration" and "continuity" are used as descriptors of the sociocultural processes or functions of neighborhood.

Neighborhood performs a function in the transmission or change of culture. Cultural continuity tends to be maximized where population turnover in a neighborhood is minimum and, the contrary, the processes of acculturation tend to be maximized where population turnover is maximum. This research attempts to detect and measure the degree of sociocultural stability or change through a mobility index which is composed either from U. S. Census data or from city directories.

The neighborhood's function in the transmission or change of culture is described by its position on the relative scale of the mobility index. The research is designed to test: (a) the validity of the mobility index as a descriptor of the sociocultural processes of neighborhood, and (b) the effect of variations in freeway location on neighborhood.

The effect of variations in freeway location on neighborhood will be analyzed by the comparative method. We expect the results of this analysis to show that where a freeway segments a neighborhood the mobility index will reflect an increase in cultural change, and where a freeway is built along neighborhood boundaries the mobility index will either remain stable or reflect a decrease in cultural change. Hence, a freeway will stimulate acculturation and the movement of people except in those neighborhoods where its location provides a buffer to change.

Thus, freeway planning may be more closely correlated with community planning and community goals. The mobility index may provide a device to predict and direct freeway influence on the residential neighborhood.

•THE CONCEPT of "weaving a freeway into the fabric of the community" gained prominence in connection with plans for the San Francisco Panhandle Parkway (1), but the concepts advanced in that report have not been realized to any significant degree anywhere. Freeway planning in urban areas is becoming increasingly mired in conflict, especially where transportation goals and community goals seem contradictory.

Both Congress and the U.S. Bureau of Public Roads have recently advanced the concept of an "urban corridor." The concept envisions multiple development of the urban freeway corridor such as the use of air space for redevelopment housing. A by-product would be the creation of an urban environment which is compatible with the freeway.

Low (2) proposes complexes of buildings, freeways, parks, and moving pedestrian belts in a "simultaneous redevelopment of a linear swath across intensively developed

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urban areas." But despite such phrases as "producing an organic whole," most such schemes are primarily visual. That is, they deal with the physical manifestations of the urban scene.

Design is certainly an essential component in relating the freeway to the urban environment, but, as Rainwater (3) pointed out, design must be related to life styles to be functional. In fact, good design which is unrelated to the social environment can produce disastrous results. Montgomery's (4) comment on the Rainwater article pointed out:

> In Cleveland some years ago a slum area project, full of award winning street furniture and undifferentiated open space, and designed by a distinguished private developer-architect team, was vandalized by teenagers. Practically next door a development, inferior by accepted architectural standards, with little decorative open space and no art work, seems to have functioned effectively as a shelter for lower class life.

Montgomery quotes an article in the St. Louis Post Dispatch concerning a $7 million remodeling to correct deficiencies in the 10-yr old Pruitt-Igoe housing project. The enclosed, glassed gallery-corridors of the project applauded by Architectural Forum as a "close, safe playground" had become what the tenants called "the gauntlet," an unpoliceable turf for violent youth and crime.

Design, alone, failed. More than an attractive format is needed. The development of the "urban corridor" concept must be based on a real social need and the functional integration of the project into the community.

There are also practical reasons why we should learn more about the effects of the freeway on urban environment. The quality of that enviornment affects the production rate.

It has long been recognized that the output of labor is subject to its working environment. Improvement of the working environment can increase productivity.

Recently, production engineers have also become attracted to the home environment. They have reasoned that a man who enters the labor force at age 17 and works a 40-hr week will spend only about 14 percent of his total lifetime at his place of work, but an even greater share of time will be spent at home. Burns (5) asserted that "it follows then that if output can be regulated by changes in the work environment, output is no less susceptible to control by varying the quality of the home environment."

Burns' point was that "the concentration of capital in industry and primary production, to the exclusion of social overhead (e.g., housing), can actually retard growth rates by overlooking the bare fact that labor's efficiency is very much a product of its environment."

The location of a new highway or freeway affects a change in environment; if that change affects the home environment in a negative fashion, this could have a negative result on production. Of course, no such neat, clear-cut relationship exists; the point is that freeway location may affect production in unexpected ways.

Thus, it is becoming increasingly recognized that ancillary investments are required to make high-ranking alternatives pay off—regardless of whether the ancillary investments are productive by orthodox economic measures.

In the analysis of highway benefits ancillary investment or costs are equally important to make the highway investment pay off. In fact, as Newcomb (6) suggested, highway investment might more logically be analyzed as a component for increasing production rather than for strict savings in transport cost.

Our desire to "weave the freeway into the urban fabric" is not currently matched by an ability to do so, because, in addition to practical administrative and financial problems, neither the urban planner nor the freeway planner has much hard knowledge about the nature of the urban fabric. That is, we have a hard time trying to distinguish "warp from weft."

Successful planning of the urban freeway requires understanding of the relationship of freeways to the urban environment. We need more information concerning the effect of freeways on the community and community goals. The most logical place to look for such information is the smallest community unit, the neighborhood.

Urban planners frequently exhort freeway planners to avoid cutting neighborhoods in two. The rationale for such an exhortation is subjective; it implies that a freeway "slashing" through a neighborhood creates some drastic negative effect. The terminology used to describe this effect is designed to create a vivid, subjective impression of the relationship between freeway and the urban residential neighborhood. Terms such as "slashing," "knifing," and "rending" are common; they imply that some violence is done in the separation and that some permanent damage occurs.

These subjective terms are used because there are almost no objective data available either to confirm or to deny the subjective and popular impression.

The problem is twofold. First, there is no real agreement about the concept of neighborhood. There are many operational definitions peculiar to a given community and descriptive of the unique neighborhoods of that community. But these hardly apply to other communities. Neighborhood is one of the most elusive concepts in modern planning. Everyone "knows" what a neighborhood is, i.e., they know, approximately, where their own begins and ends. But only fiction writers can describe a neighborhood with sufficient accuracy to convey "knowledge" to a third party. Without some agreement on the nature of neighborhood, it is difficult to evaluate "effect."

The second part of the problem involves the nature of the effect.

One component of freeway effect has been widely studied, i.e., the effect of freeway and freeway proximity on adjacent property values. In fact, a fairly extensive volume of information has been collected about the effect of freeways on values of single-family homes adjacent to freeways. It is assumed that if some rending does occur, this drastic effect would reduce value. There is no evidence to indicate that such a situation has ever occurred. The analysis of sales of homes adjacent to or near a freeway indicates little or no negative effect on relative sales price.

However, the sales data collected so far are subject to the following two shortcomings.

1. To our knowledge, none of the data collections and analyses have made any attempt to relate to a concept of neighborhood. There is no indication that any data collection and analysis has been made of a situation in which a neighborhood has been split by a freeway.
2. The sales data collection is essentially in a vacuum; few data are available about the relative effect of a freeway on the whole neighborhood. Furthermore, there is rarely any information about the effect on the neighborhood in relation to the community at large. In other words, most of the sales data collections and analyses show that an adjacent home or group of homes have not decreased in price since the freeway, but they do not indicate the condition of the real estate market for similar homes, for instance, six blocks or more from the freeway. Thus, whereas adjacent homes, and even neighborhoods, may have maintained a constant value since the construction of a freeway, comparable homes in the rest of the community may have increased in value at a rate of 5 percent per year. Although many such studies adjust values based on trend information, accepted real estate appraisal practice would preclude comparison with the community in general.

Thus, we have little or no direct knowledge about the nature of freeway effect on the residential neighborhood, as measured by value. (Several recent California Division of Highways studies deal with the value component of "effect," using neighborhood and community as control (7, 8), and a forthcoming study deals with residential neighborhoods along the Santa Monica Freeway; but the concept of neighborhood is not sufficiently developed in these studies.)

Other measures may provide us with more information concerning both the nature of neighborhood and the effect of the freeway.

Sawhill's (9) study indicated that the North Broadway area of Seattle, cut into three parts by two expressways, is tending to become three separate neighborhoods rather

than remaining one homogeneous residential area. However, the limited scope of the study precluded any extensive consideration of change; there is no clear-cut indication of the nature, area, and dynamics of the neighborhood before the expressways. Until change is more fully understood, generalizations and predictions will be fruitless.

California has devised a "mobility index" which we hypothesize to be a measure of neighborhood and change. And through a Federally sponsored research project we propose to test the validity of the mobility index in measuring freeway effect on neighborhood.

THE NATURE OF NEIGHBORHOOD

In devising the mobility index we had to make many assumptions about the nature of neighborhood; many of these assumptions are tested, or will be tested, in the process of testing the index. Other assumptions are not capable of testing at the present time.

A neighborhood is the smallest subcultural cluster of primary families. Selection of neighborhood location by the resident is based on cultural considerations. A neighborhood, as an entity, can assume a sociocultural function, or role, by reinforcing the family's ability to transmit its culture from generation to generation; hence, the family selects that neighborhood in which the behavior pattern of the residents is most like its own. The result can be the creation of clusters of subcultures with some degree of cultural continuity.

Tryon (10) asserted that "...persons having the same general social attributes, beliefs, and actions share a 'feeling of belongingness' and easy communication. They mutually support each other and foster easy interaction by locating homes together." He indicated that another factor "...is the force of 'role expectation.' Persons of a given occupation group, income and culture are expected as part of their social role to live together in certain areas."

Neighborhood, then, is a geographical area in which certain patterns of behavior are common or predominate. The boundaries of neighborhood are not fixed, but fluid. In some instances, physical or zoning features provide a sharp line of demarcation for neighborhood. More often, however, no sharp distinction exists. Consequently, residents tend to define neighborhood boundaries in terms of major streets and highways. And the neighborhood's role in the transmission of culture is frequently reinforced by the neighborhood elementary school, which usually sets its boundaries at major streets and highways.

As a result, the "wall" around any neighborhood consists of the major streets which isolate and insulate the neighborhood from the "alien" influences of other neighborhoods.

However, not all people live in such neighborhoods. Many live in neighborhoods of great cultural diversity, where no pattern of behavior either dominates or is most common. This is the neighborhood where many cultures and subcultures meet, react and change, the neighborhood of acculturation rather than cultural continuity.

In fact, most neighborhoods probably fall on a continuum somewhere between these extremes.

Neighborhood, then, is a device for both the transmission and change of culture. Different kinds of neighborhoods might be discriminated by the degree of cultural change which occurs.

One way to measure that change might be with demographic factors. Tryon's (10) cluster analysis indicated that demographic variables isolate demographic social areas and that a demographic social area is also a psychosocial area; hence, an area homogeneous in demographic features will also be homogeneous in psychosocial ways.

Behavior tends to be organized into patterns that are predictable, recurrent, and dependable. Farley's (11) study of suburban persistence revealed that suburban socioeconomic characteristics persisted despite rapid population growth in the suburbs. He showed that "...a sound prediction of 1960 socioeconomic characteristics of a particular suburb could be made merely by knowing that suburb's characteristics in 1920. When the shorter time span, 1940 to 1960, is used there is even greater evidence of persistence of suburban characteristics." He concluded that "...the characteristics of a suburb may be fixed relatively early in that suburb's history and subsequent growth reinforces existing socioeconomic residential patterns."

Hence, our hypothesis: to the degree that population in a neighborhood is stable, the cultural patterns of that neighborhood can be expected to be continuous, persistent and enduring.

MOBILITY INDEX

The U. S. Census Tract reports, PHC(1), record several items relating to population stability. One item measures population mobility (the converse of stability) directly: the number of persons 5 years old and over who occupy the same residence in 1960 as in 1955. This item alone was tested to determine if the percentage of total population in the same residence would describe neighborhood.

Alone, this figure is not valid. For instance, in California new subdivisions less than 5 years old register zero; older neighborhoods, fringed by apartment buildings may register very low percentages, i.e., a high turnover, but actually be very stable because the population which is turning over is the fringe apartment dwellers. Also, many neighborhoods which are culturally discrete and persistent have grown significantly in recent times, but in terms of pure mobility the number of new residents (in the context of an expanding population) would show high mobility in the last five years. The latter two cases are quite common in California.

Thus, in addition to population mobility information which can be obtained from the census, two factors which would indicate the propensity for culture change were added. These are home ownership and single-family dwelling units.

Cohen's (12) study of the relationship between home ownership and the social characteristics of the family revealed that "...homeowner families are more inclined than are tenant families to have those characteristics which are generally regarded as 'stable'." Her study finds that homeowners "move about less;" only about one in three homeowners had moved in a 5-yr period, compared to three out of four tenant families.

Sullenger (13) found that "...there is greater stability among homeowners than among renters. One out of every six homeowners moved out of his dwelling, as compared to one out of every two renters." Furthermore, he found a "...far greater stability among the families in rented, individual family houses than among those who reside in apartments."

Thus, there is evidence that the components of home ownership and single-family dwelling show stability and a propensity to cultural continuity.

The mobility index (MI) was therefore designed to provide some information about neighborhood stability; it is composed of the following factors available from the 1960 Census.

1. Two factors measure population mobility: (a) the percent of persons 5 years old and over who occupy the same residence in 1960 as 1955; and (b) of the units built in 1939 or earlier, the percent occupied by the same household since that time.
2. Two factors which measure propensity to change: (a) the percent of units which are single-family residences; and (b) the percent of units which are owner-occupied.

The MI is the summation of those four factors for the smallest geographical unit possible. A high sum (maximum 400) is a "high MI" and means a very stable neighborhood; a high MI might be equated with low "population mobility" or "turnover."

However, a very low sum (minimum 0) is a "low MI" and means an unstable neighborhood or possibly high "population mobility" or "turnover."

The four MI factors combined yield a relative measure of existing stability plus some measure of future tendencies, i.e., it yields some measure of predictability.

Table 1 gives a summation of the MI for an area in Los Angeles affected by the then proposed Beverly Hills Freeway. Additional socioeconomic data are reported for each census tract. The MI as devised is a test of cultural continuity—not "class." Thus there is no correlation between median family income, home value or rent, and the MI (Table 1). Middle-class neighborhoods can be, and are, just as stable as upper-class neighborhoods. In fact, the area known as Watts has a relatively high MI.

A partial explanation for this is that another kind of mobility is introduced by insertion of the "class" concept, i.e., the vertical mobility from class to class. Sullenger (13)

TABLE 1

MOBILITY INDEX FOR AREA IN LOS ANGELES AFFECTED BY PROPOSED BEVERLY HILLS FREEWAY[a]

Area	Census Tract	Code	Population	Housing Units	Median Family Income ($)	Median Value, Owner Occupied Units ($)	Median Rent ($)	Percent Pop. Same as 1955	Percent Owner Occupied	Percent SFR's	Percent Same as 1939	Mobility Index
West Los Angeles (green line)	2672	LA-1	3261	1425	8,516	21,300	97	47.5	53.0	65.8	16.6	182.9
	2671	LA-2	4665	2096	9,405	25,000+	116	44.8	48.6	56.7	19.8	169.9
Westwood (blue line)	2655	WW-1	4237	2206	8,591	25,000+	113	36.2	26.6	14.8	11.3	88.9
	2656	WW-2	3920	1966	10,655	25,000+	136	47.0	35.0	35.0	15.9	132.9
	2657	WW-3	3937	1919	12,464	25,000+	135	42.0	33.1	33.8	12.4	121.2
Bel-Air (red line)	2622	BA-1	3358	1174	22,706	25,000+	165	45.8	69.2	77.3	8.9	201.2
	2621	BA-2	3835	1134	20,273	25,000+	–	48.8	91.0	97.4	21.3	258.5
	2612	BA-3	2155	851	14,500	25,000+	–	32.0	72.4	95.2	10.6	210.2
Beverly Hills ("Northside")	7007	BH-1	4034	1168	25,000+	25,000+	–	54.2	86.4	95.5	16.8	252.9
	7006	BH-2	5425	1593	25,000+	25,000+	–	51.5	88.0	100.0	18.4	258.9
West Hollywood	7005	WH-1	5187	2969	7,648	20,200	117	32.5	18.4	31.4	13.6	95.9
	7004	WH-2	5018	2357	7,123	19,000	97	40.2	37.4	50.5	15.6	143.7
	7003	WH-3	3981	2265	7,857	–	127	20.2	7.3	7.5	6.3	41.3
Hollywood (red line)	1944	HR-1	5321	2229	6,711	21,200	97	44.8	39.4	40.1	11.2	135.5
	1922	HR-2	4376	1839	6,078	18,000	89	44.5	45.3	46.5	12.3	148.6
	1921	HR-3	1696	760	5,843	18,900	79	35.0	34.4	43.0	11.9	124.3
	1919	HR-4	4990	2285	6,710	20,100	90	39.8	35.7	56.0	11.4	142.9
	1918	HR-5	4475	2309	5,857	17,300	79	28.2	14.7	37.8	9.9	90.6
Wilshire (blue line)	1945	WB-1	2669	927	7,420	22,700	97	47.6	62.5	66.5	13.0	189.6
	2144	WB-2	4293	1797	5,034	–	91	36.2	14.7	2.9	4.5	58.3
	2143	WB-3	2182	752	9,063	25,000+	108	53.0	61.2	58.0	11.2	183.4
	2142	WB-4	2097	688	11,695	25,000+	115	50.8	64.0	60.0	12.4	187.2
	2141	WB-5	4475	1840	11,809	25,000+	115	53.2	42.3	28.1	11.6	135.2
	1923	WB-6	2331	1313	9,878	23,500	130	48.0	33.0	37.5	12.8	131.3
Wilshire—tracts common to both red and blue	1924	WC-1	5429	2772	6,846	18,600	82	39.6	30.8	36.7	13.8	120.9
	1925	WC-2	3802	2014	6,256	16,300	79	41.2	25.7	48.4	10.5	124.8
City of Los Angeles		–	2,479,015	935,507	6,896	17,300	78	38.8	43.1	59.8	11.0	152.7
County of Los Angeles		–	6,038,771	2,142,139	7,046	15,900	81	39.5	51.1	70.2	12.5	173.3

[a]Source: U. S. Census.

found some correlation between vertical mobility and horizontal mobility, but when "...horizontal mobility is accompanied by ... vertical mobility, stability generally follows; for the majority of those who rise on the vertical scale are [become] home-owners."

Goldstein and Mayer (14) noticed that "migrants, compared to non-movers, tend to be more heavily concentrated in the higher socioeconomic groups, as measured by occupation, education, and income."

On the other end of the class scale, Sullenger indicated that the mobility rate among Negroes and foreign-born whites was lower than the rate of mobility among whites. A concentration of foreign-born whites or Negroes produces an island of cultural continuity with less mobility. In California the MI measures this stability because of the wide prevalence of single-family dwellings; even in Watts most of the land area is devoted to single-family dwellings.

Thus, the MI is not a measure of "status"; it is not designed to distinguish the best neighborhoods from the worst. It is a device to discriminate culturally homogeneous areas within a community without regard to notions of status. (There is some bias toward middle economic groups with the concept of home ownership, but if the index is used as a relative rather than an absolute measure, this bias is eliminated by the comparison of similar neighborhoods within the community.)

FREEWAY EFFECT

When the MI is computed and plotted on a census tract map, the ordering by proximity is evident. The nature of culture is such that cultural groups cluster. If the MI does measure a relative degree of cultural continuity, then we would expect that it would tend to cluster. Our preliminary examinations indicate that this is the case. The higher indexes tend to cluster around individual, and localized, maximums, whereas the lower indexes tend to cluster around lows.

If our concept of neighborhood is valid, the effect of a freeway impinging on a neighborhood would be to disrupt the cultural continuity. The effect would manifest itself in terms of many persons leaving the neighborhood, replaced by others with different patterns of behavior. This phenomena would be detected by the reduction of the MI.

However, the term "disrupt" may not accurately describe the events which occur. The phenomena which may occur is "acculturation"—an increase in the degree of cultural mix and, hence, change.

Thus, we would expect the testing of the MI to reveal that where a freeway segments a neighborhood the MI tends to decrease, and where the freeway is built along neighborhood boundaries, the MI tends to remain the same or even increase. We would expect a freeway to stimulate acculturation and the movement of people, except in those neighborhoods where location of the freeway provides a buffer to change.

The MI was first used in the route planning stages of the Beverly Hills Freeway (15). The various route proposals affected diverse residential neighborhoods in Hollywood, Beverly Hills, Bel-Air and Westwood. Some of the route proposals affected the homes of some famous persons. The conventional economic measures associated with this route were enormous. Cost of the 9-mi route varied from $205 to $225 million, and more with special design features. This amounted to more than $23 million per mile. Right-of-way accounted for 75 percent of the total cost or more than $17 million per mile. The size of this investment made it absolutely essential that sound information about community and community effects be provided for the route decision. Each line had equally vociferous proponents and opponents.

To compare the various proposed lines, the MI was accumulated and averaged along each line. This process simply involved the addition of each index for an affected tract and then division by the number of tracts. This was possible on these routes because the census tracts were small, they closely approximated neighborhoods, and only two census tracts were common to the two major lines. No attempt was made, however, to weight the index based either on affected population or area of the census tract. The results are indicated in Table 2. The line finally selected is a modification.

TABLE 2

MOBILITY INDEX
VARIOUS LINES, COMBINATIONS AND SEGMENTS

Designation	1960 Index
Segments	
Red line—Doheny to Sepulveda	236.3
Green line—Sepulveda to Century City	176.4
Blue line—Ardmore to West Hollywood	141.3
Red line—Ardmore to West Hollywood	126.8
Blue line—Sepulveda to Century City	114.3
Lines and Combinations	
Green-blue	164.5
Dash green-blue	162.4
Red	157.6
Blue	152.1
Green-blue-brown(A)-red	149.0
Green-dash blue-blue	147.9
Green-blue-brown(B)-red	145.3
Dash green-blue-brown(A)-red	144.0
Dash green-dash blue-blue	141.6
Dash green-blue-brown(B)-red	139.7
Blue-brown(A)-red	137.7
Blue-dash blue-blue	134.8
Blue-brown(B)-red	134.3
Green-dash blue-brown(A)-red	129.6
Green-dash blue-brown(B)-red	125.2[a]
Dash green-dash blue-brown(A)-red	119.1
Blue-dash blue-brown(A)-red	117.9
Blue-dash blue-brown(B)-red	114.0
Dash green-dash blue-brown(B)-red	113.9

[a]Modified line selected.

In the case of the Beverly Hills Freeway, the MI proved to be a useful tool in the route selection process. Subsequent experiments and tests with the index have not proven as successful, for the following reasons.

1. The census tract is normally too large; variations of only one block in freeway proposals cannot be discriminated by the MI. Block reports do not record population mobility information.
2. The year 1960 is becoming increasingly remote. Up-to-date information is necessary because of tremendous growth.
3. To test our concept of freeway effect we must have some information about the change of the MI over time. The 1950 census did not report the same information as the 1960 census and the MI cannot be compiled from 1950 data. The 1950 census reported moves between 1949 and 1950, rather than between 1945 and 1950.

To test the index adequately and apply it to other areas, it became necessary to approximate the MI from other information sources. The California Division of Highways is conducting a study sponsored by the U.S. Bureau of Public Roads to test other sources.

The most promising source, other than a field survey, seems to be the city directory. With the use of the city directory, components of the MI can be compiled on a block-by-block basis. Home ownership is reported; single-family dwelling units can be discriminated; by comparing names in directories for various years, mobility can be calculated. However, there is some variation.

The street index of the city directory normally reports only the head of household, and would thus reveal only a move on the part of the entire household. The census, however, records moves of the entire population in the last five years.

In California, city limits have changed significantly since 1939. Thus, using city directories, 1939 data are not readily comparable to 1960 data.

Generally, however, city directories should be a reliable source of data. They have been used before to test mobility. Goldstein's (16) Norristown study was based on city directory information. In addition, Goldstein mentioned several other studies which tested the validity of city directory data. For example, he indicated that:

> Dr. Norman Lawrence of the United States Bureau of the Census made an intensive analysis of the directories of Washington, D.C. to determine their value for estimating the population of Washington in intercensal years. He found that both the 1930 and 1940 directories contained over 99 percent of the comparable census population of those respective years. On the basis of these findings, Dr. Lawrence concluded that the. . ."use of directory listings as a datum for the estimate of the population aged eighteen and over is warranted (17)."

To organize our data geographically, however, our study uses street index information rather than the name index. The street index lists only the head of household. It is assumed, however, that if the name index is valid, the street index is equally valid.

The initial test of the MI derived from city directories used only three factors: (a) household head listed in both 1955 and 1960 directory—household head was counted as the same if the last name was the same for the same address in 1955 and 1960; (b) owner-occupied; (c) single-family dwelling (1939 data are not considered comparable to the census).

The three-factor index was tested in several census tracts in Sacramento. Table 3 compares the three-factor index derived from the census with that derived from the city directory. The correlation of the two indexes is 0.9726. It would seem that the three-factor index derived from a city directory reasonably approximates a three-factor index derived from the census.

The second test of the MI involved the three-factor concept. Because of difficulty in obtaining comparable California data for 1939, we deleted this portion of the index as derived from the city directory. We next asked if the three-factor index is comparable to the four-factor index, and if it provides the necessary information about neighborhood and neighborhood boundaries.

The first analysis of the comparability of the three-factor to the four-factor index produced negative results. The indexes are not sufficiently comparable. The elimination of the 1939 factor created too strong an emphasis on factors designed to show propensity to stability, i.e., home ownership and single-family dwelling. To minimize this effect these two factors were averaged, producing a two-factor index with a maximum of 200:

$$\text{MI} = \text{percent household same in 1960 as 1955} + \frac{\text{ownership} + \text{single res.}}{2}$$

Then, to determine the comparability of this two-factor index, every tenth census tract in the city of Los Angeles was tabulated and the two-factor census index was compared with the four-factor census index. The result was a correlation of 0.9775. Hence, for further testing of our concepts of neighborhood and freeway effects on neighborhood, we feel that the two-factor index derived from the city directories reasonably approximates the four-factor index derived from the U.S. Census. We are now in a position to refine the MI on a block-by-block basis to analyze neighborhood in more recent years than the last census.

The next steps in the study, to be completed during 1967, will consist of the following.

1. Compiling the MI on a block-by-block basis for various communities in California and some other western states.
2. Plot MI and analyze clusters.
3. Compare and evaluate 1960 and 1965 data.
4. Compare 1960 MI to 1965 MI for neighborhoods where a new freeway has been introduced in the interim. Compare changes to other neighborhoods and clusters.

TABLE 3

SACRAMENTO (Portion)
COMPARISON OF MOBILITY INDEX SOURCES—THREE-FACTOR INDEX

Census Tract	Same Residence, 1955-1960 (%)		Owner Occupancy (%)		Single-Family Residence (%)		Mobility Index (three-factor)	
	Census	City Directory	Census	City Directory	Census	City Directory	Census	City Directory
18	50.7	41.6	52.8	53.5	71.0	76.1	174.5	171.2
22	49.5	40.9	50.0	50.3	77.0	60.8	176.5	152.0
23	64.8	58.2	76.7	73.5	96.1	97.9	237.6	229.6
24	67.9	65.4	81.0	81.8	88.9	95.1	237.8	242.3
25	63.0	64.8	86.1	87.1	96.0	98.1	245.1	250.0
26	52.7	48.4	62.0	60.4	72.5	82.8	187.2	191.6
27	40.9	35.6	46.5	43.9	67.7	73.6	155.1	153.1
28	47.0	47.6	67.0	66.0	89.1	88.6	203.1	202.2

[a]Correlation: r = 97.26.

Clearly, even further research will be necessary before the MI can be determined to be a completely reliable tool in the freeway route location process. But it is equally evident that the index shows great promise as an instrument to assist in defining and locating neighborhood and further promise in the determination and prediction of freeway effects on neighborhoods.

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