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THE EFFECT OF LOCATION ON THE SPATIAL BEHAVIOR OF THE  
RESIDENTS OF INSTITUTIONS FOR THE ELDERLY: A COMMUNITY ANALYSIS

by

CHARLOTTE JEAN BREEDLOVE

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Approved by:

*W. T. Siddall*  
Major Professor *per E. F. Stover*

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## Chapter 1

### INTRODUCTION

I think there is no country, that has the means we do, that has done so badly in providing for the elderly as we have here in the United States. This is one of our failures. We have our successes, we have much to be proud of in this country, but this treatment of the elderly is something that we ought, by right, to be ashamed of, and I think that is why it cries out so for attention. --Hon. Frank Church, Chairman, Senate Special Committee on Aging.<sup>1</sup>

### BACKGROUND TO THE PROBLEM

In order to take advantage of the array of goods and services or social and work opportunities existing in the urban environment, individuals must in some way gain access to them. However, the specialization that characterizes our industrial, urban society has its spatial expression in the separation of residence and the various needed or desired urban functions. This diversification has been accompanied by the auto-oriented, suburban shopping center serving a large trade area and the decline in importance of the central business district. The development of specialized functional districts such as the outlying medical districts is another facet of a decentralization occurring in American urban areas.

This dispersal of urban functions naturally places a premium on the mobility of all citizens, but creates special problems for older people who are frequently handicapped by health and economic considerations. Because of the lack of transportation -- or lack of "access" -- the elderly may abandon

the idea of visiting relatives or senior-citizen centers, recreational activities, or shopping for bargains or lower prices. During testimony before the U.S. Senate, the claim was made that in many cases the aged's greatest barrier to leading a self-sufficient life is the problem of movement from place to place, residence to shopping, recreation, or other destinations.<sup>2</sup> In Transportation and Aging, Williams went so far as to say that the problem is so severe that millions of elderly Americans, urban and rural, are trapped within walking distance of their homes - restricted to the narrow boundaries of their immediate neighborhoods.<sup>3</sup>

A background paper for the 1971 White House Commission on Aging stated that housing as environment can be viewed from three primary aspects. First is the design and characteristics of the physical structure in relation to the biological changes associated with aging. Second is the effect of the characteristics of the housing and its milieu upon the social and psychological behavior of the occupants. Last is the geographical location of the housing with special reference to its accessibility to the total community.<sup>4</sup> The third aspect and its resulting effect upon the spatial behavior of the residents of institutions for the elderly is examined in this thesis. More precisely, in this research effort "location" refers to the physical position of a residence or institution for the aged, relative to the rest of the community, including shopping, social, medical, and entertainment resources. The term "spatial behavior" connotes "daily trip activity", specifically movements to and from the residence for any purpose, e.g., going shopping, attending a sporting event, going to the doctor, taking a walk, or visiting relatives or friends.

Chapter 1 is primarily concerned with establishing a broad background for the research problem. It therefore considers the aged in today's society, particularly regarding their "access to opportunities" problems;

and closely examines elderly institutionalization and the location of homes for the aged. Chapter 2 is devoted to a review of relevant literature as well as a general delineation of the methodology of the investigation and analysis. The third chapter outlines the design and implementation of the questionnaire - interview. It principally consists of a summarization of the survey findings to ascertain the effect of institution location upon resident spatial behavior. An analysis of the relationship between location and daily trip activity, allowing for non-locational effects, is the purpose of Chapter 4. A summary of the research, conclusions, and suggested solutions to the "access to opportunities" problem of the aged follows in the final chapter.

#### THE ELDERLY POPULATION

Aging is culturally rather than chronologically defined in certain societies. Where life expectancy is low, persons in their forties or fifties may be regarded as "the elders" or the "elderly". In our highly time conscious and calendar-oriented society, old age is viewed in terms of birthdays and "begins" on the sixty-fifth. The magical demarcation between middle and old age by this arbitrary figure is based on governmental policy, for instance, that denoting it as the ensuement of retirement and full social security benefits.

Life expectancy in ancient Rome or medieval Europe was a mere twenty to thirty years. An average lifetime in the United States was about forty years in the mid-nineteenth century and almost fifty by 1900.<sup>5</sup> Today's life expectancy is approximately seventy-one years.<sup>6</sup> However, the older segment of the present elderly population is growing faster than the younger aged. Only a third of all senior citizens are under seventy years of age. Four out of ten are seventy-five or older.<sup>7</sup> Life expectancy

figures also mask the fact that the average lifetime for females has increased much faster than for males, resulting in a growing preponderance of women in higher-age classes.<sup>8</sup> At present, a man can expect to live 66.9 years, and a woman 73.7 years.<sup>9</sup>

The elderly constitute the fastest growing population in the United States. Approximately twenty million Americans, one out of ten, have passed their sixty-fifth birthday.<sup>10</sup> This contrasts with the turn of the century when only one out of twenty-five individuals, or three percent, were elderly.<sup>11</sup>

The significance of these twenty million "senior citizens" is illuminated in Senator Prouty's statement:

We glibly use the figure, "twenty million Americans," but really fail to understand how big this is. It contrasts with less than seven million forty years ago. Only one-fourth of the world's nations have individual populations so large. Of the more than 100 non-Asiatic nations, only sixteen have as many as twenty million in their whole populations.<sup>12</sup>

Further, about the year 2010, when the World War Two "baby-boom" becomes a "senior citizen boom," it is estimated there will be fifty-five million aged Americans.<sup>13</sup>

The change in the relationship between the generations is more than just the ratio or numbers. The qualitative changes also merit attention. Since the turn of the century the nation's social structure has experienced a complete transformation from an agrarian to an urban culture. This kaleidoscopic change to an urban society, the expanding industrial revolution, and the resulting mobility of the American population has culminated in the decentralization of the extended, multi-generation family formerly under one roof. Moreover, the trend is toward an even smaller nuclear and neolocal family. The average U.S. household was 5.2 persons in 1970, while in 1980 it is projected to be only 2.8 people.<sup>14</sup>

In today's society, youth worship has become almost as entrenched as ancestor worship in the Orient. While the elderly enjoyed a major role in our rural past, that role and the status concomitant with it have been virtually eliminated. Not only are the aged no longer needed for such tasks as looking after the younger children, and farm chores, they no longer possess the means, including tools, and the know-how to pass down to children or apprentices.

We haven't yet decided what we expect as a culture of the older retired persons, and I think, in addition to that, we haven't decided what we will permit him to do. Traditionally, the older person in the community had a role in that he had lived longer, he therefore had more experience, he was wiser...he knew where the tigers were in the jungle. --Nathan W. Shock <sup>15</sup>

It is only recently that we have recognized that "access to opportunities" counts heavily among the requirements for an adequate quality of life for our elderly citizens. The degree of ease with which they can reach a store or other facilities may proportionately affect their happiness, mental well-being, and even health. When the effort required to go outweighs the motivation to go, a door is closed to the individual with incalculable psychological impact.

However, the effects of poor residence location can be alleviated somewhat by the availability of transportation. Yet in our vehicle-oriented society the aged population is much less likely to possess cars or licenses to drive them. Even licensed elderly face obstacles such as rising costs of fuel, automobile upkeep, higher insurance rates, and the feeling that they cannot drive "anywhere" or at any time of the day. Further, taxis are expensive and seldom utilized.<sup>16</sup> Walking as a means of locomotion has limitations for any purpose other than trips of short distance which do not involve carrying heavy packages.

Therefore, many elderly can be classified as "transportation dependents," relying on public transportation or the good will of relatives, friends, or neighbors to take them where they need or want to go.<sup>17</sup> Naturally, in such a situation independence and freedom of choice are most limited. Moreover, mass transit has numerous, inherent drawbacks, including exposure to bad weather in waiting, high fares, the inconvenience of transfer waits, and the increasingly irrelevant CBD-focused networks.<sup>18</sup> High fares are especially difficult for the aged who have less than half the income of their younger counterparts, with forty percent at or below the poverty line.<sup>19</sup>

It is relevant that the mobility problems of the aged do not necessarily reflect their willingness and capacity to travel. Many studies have revealed that the elderly would like to make more "daily trips" if they had access to transportation.<sup>20</sup> Evidence shows that this desire is in some respects even stronger than that of those younger. For example, one study indicated that elderly people evidence the most tolerance and patience with multiple transfers and poorly scheduled services in public transit.<sup>21</sup>

Government figures illustrate the aged's potential for spatial behavior. About eighty percent of those over sixty-five have the capability for mobility without assistance. Approximately eighty percent have some trouble getting around but can manage, possibly using a mechanical aid. Another six percent need the help of another person, with only five percent homebound.<sup>22</sup>

The picture of the decrepit, doddering oldster is a gross exaggeration. The overwhelming majority of older people can manage in the community if society permits. They would manage even better if society would encourage activity through the provision of essential services.<sup>23</sup>

Transportation discrimination against the elderly has just begun to receive the attention it deserves as a serious problem. Responding to a proposal made by the President's Task Force on Aging, in 1970 an inter-

disciplinary conference on transportation convened representing the first systematic attempt to gather data on the mobility of the nation's aged.<sup>24</sup>

The emergence of transportation as a high priority issue can be traced to complaints from the elderly themselves. For example, at 6,000 forums conducted as a prelude to the 1971 White House Conference on Aging, many classified transportation as second only to income and health problems. Further, a surprisingly large number listed transportation as the number one problem (exact figures not specified).<sup>25</sup>

In a later action, the Senate Special Committee on Aging declared that the transportation or mobility difficulties encountered by many aged citizens have reached a crisis stage. "Transportation" was designated as one of nine key "need areas" of the elderly on the agenda of the 1971 White House Conference on Aging.<sup>26</sup> The committee concluded that:

...it is as important for the Nation to develop or have developed special transportation arrangements for older persons as it is for the Nation to meet their income health, and other needs. If such systems are not developed, the task force is convinced that older persons will in a society increasingly dependent upon the automobile, be effectively shut out of the life of that society.<sup>27</sup>

Federal, state, and local governments have reacted to this stimulus in a wide variety of ways. The President signed into the law the Urban Mass Transportation Assistance Act of 1970, which contains a provision calling for special consideration to the needs of the elderly and infirm in the planning, design, and operation of urban transportation services.<sup>28</sup> At least fifty American communities responded by establishing programs of fare reduction and even elimination at certain off-hours, although some are limited to the low-income aged.<sup>29</sup>

Various other communities adopted numerous personal transportation experiments utilizing vehicles such as minibuses or school buses. Such projects,



though usually short-lived owing to financial considerations, show an overwhelming increase in the frequency of trips for older people due to the more convenient and personalized transportation.<sup>30</sup> The Aging Transportation Agency in Manhattan, Kansas provides a free minibus service - ATA-bus - although regrettably it was not in operation during the conduction of the interview-surveys for this thesis. Another scheme initiated in Manhattan is the "elderly taxi" concept, allowing reduced fares for senior citizens. Its effectiveness is examined in Chapter 3.

#### INSTITUTIONALIZATION OF THE ELDERLY

Problems of the elderly, such as "access to opportunities," may be eased or exacerbated by the older person's living arrangements. Naturally, those aged in institutions - i.e., the various forms of old-age homes, ranging from the county poor farms to rest homes, nursing homes, and homes for the aged - have needs and wants that set them apart from the elderly population as a whole.<sup>31</sup> The nature of their needs is more apparent when placed in context.

#### Introduction

Care for the aged reflects the growth of civilized human society. Although negative connotations are still associated with institutions for the elderly, we have come a long way since the time when the old were considered expendable because of the culture of the period, religious practices, or failure to be productive.

In our country's not so distant past when care for the elderly was primarily a filial responsibility there were few unattended, indigent aged persons. Care for them was provided in a meager but businesslike way in the county "infirmary," the "poorhouse," or similar institutions. In more recent years, pension and insurance services - along with the trend toward a nuclear

family has changed the methods of providing support and care for the elderly. Since the earliest old-age homes - for only the healthy and needy elderly - many such institutions have been established and maintained by churches, immigrant aid societies, fraternal orders, labor unions, and governments.

Institutions for the elderly today are in a transitional stage of development. They are moving from purely domiciliary facilities towards more professional and service-oriented functions, with a wide variety of programs designed to provide residence in combination with medical services of varying degrees. Though some elderly institutions offer little more than non-house-keeping accommodations, the modern old-age homes include both comparatively well older persons and the more infirm under the same roof, sometimes assigning different wings or floors for those requiring nursing care. Skilled nursing care beds can be found in four different kinds of institutions listed by the Public Health Service - nursing homes, homes for the aged, boarding homes and rest homes.<sup>32</sup>

Of course, wide-spread confusion prevails with respect to the character and appropriate functions of the variously named institutions. Adding to this confusion are differences in the names applied to the places offering care. For example, the American Nursing Home Association reports that there are more than 120 different names for nursing homes. Problems of classification are illustrated by the states of Utah, with ten levels of care, and Wisconsin, with twelve.<sup>13</sup>

#### Characteristics of the Elderly in Institutions

According to the 1970 census, more than nine out of ten aged persons were members of households, while about five percent were cared for in institutions, and

less than one percent lived in other group quarters.<sup>34</sup> Five percent compares with 2.5 percent institutionalized elderly in 1940 and 3.8 percent in 1960.<sup>35</sup>

The 795,807 aged in the country's 24,037 institutions for the elderly vary markedly by age, sex, and color.<sup>36</sup> with advancing age beyond sixty-five, rates of institutionalization increase, sharply among those aged eighty-five and over. Institutional data reveals that some twenty years ago the average applicant was sixty-five years old and the average resident about seventy years. Today the average person who initiates an application is approximately eighty and the average resident is just under eighty-five.<sup>37</sup>

By sex, female rates of institutionalization are generally higher than male for old people at all ages, due primarily to the preponderance of women in the population.<sup>38</sup> By color, nonwhite rates are lower than white rates; about three percent for both Negroes and other races compared with five percent for the white elderly group.<sup>39</sup>

Not surprisingly, those segments of the elderly population over-represented in institutions constitute the relatively disadvantaged in terms of health, family ties, and financial resources.<sup>40</sup> Moreover, they are less likely to have a living spouse or children and more likely to have lived alone prior to institutionalization.<sup>41</sup>

In 1970 about forty-five percent of those in institutions for the aged were known to be receiving skilled nursing care; the remaining fifty-five percent were in homes offering mainly domiciliary care.<sup>42</sup> Sixty-one percent were in private proprietary homes (operated for profit), twenty-four percent in private non-profit homes, twelve percent in country and city homes, and three percent in federal and State homes.<sup>43</sup>

#### Aged Institutional Life

The prevailing image of elderly institutional life is largely negative.

Typical opinions are expressed in the following quotations: In "Where Doctors Fail" the President of the Rockefeller Foundation wrote, "Our acute, curative, scientific and technical service is unexcelled in the world. Our preventive and rehabilitative services and our extended care and nursing facilities are dismal."<sup>44</sup> It has been observed that nursing homes "are spending more money per person and giving less care - it's depersonalized."<sup>45</sup> Another critique argued that:

It is no mistake to identify them all as "halfway houses" between society as we know it and the cemetery. In their shrinking away from the real world, their isolation from the normal pursuits of old people living at home, many are in reality "pre-funeral homes." In a large version of our society, we may rightly speculate about the soundness of a theory which relegates the old and otherwise unwanted segments of the population to a beneficent prison. Such a theory smacks of euthanasia or the social-fitness doctrines of Plato's Republic...but the extent of isolation in homes for the aged is a major social phenomenon that must be considered.<sup>46</sup>

The Senate Special Committee on Aging concluded in its 1970 annual report with the following:

While there has been substantial progress in meeting the institutional needs of the one million institutionalized elderly, there continues to be serious problems. The needs of this group have been assigned low priority and the programs which have developed are often piecemeal, inappropriate, illusory and short-lived. What is reflected is a lack of a firm policy for the infirm elderly...the rhetoric speaks of care and concern but the reality resembles confusion, high costs, and too often, poor care or no care at all for those who need it.<sup>47</sup>

Although the Committee did make a number of minor recommendations, no new programs were proposed in Congress.<sup>48</sup>

In general, the elderly's aversion to institutional living is more marked than that of the public at large, of whom less than half oppose old-age homes.<sup>49</sup> Only three percent of those over sixty-five say they would like

nursing home as the best living arrangement for those who can no longer care for themselves. Ironically, the more advanced the old person's age, the less he favors living in an elderly institution.<sup>50</sup> In other words, while an aged individual might consider the possibility of institutional living in the vague future, he cannot cope with the immediate reality. In Peters' and Kaiser's local survey of the needs and life circumstances of non-institutionalized elderly in Manhattan, Kansas, slightly more than one-half indicated that they would consider living in a nursing home. But they qualified their statements, more frequently by adding that they would only as a last resort. Peters and Kaiser also found that advanced age as well as well as poor health was related to unwillingness to live in a nursing home.<sup>51</sup>

To some extent negative attitudes towards institutions for the elderly appear related to the aging individual's desire to stay with his family or to avoid residential change. But they probably also reflect the image of the poor farm or the almshouse of yesterday. To what degree are these attitudes justified? On the one hand, institutions may cushion the impact of isolation, provide needed protective services, and offer physical, drug, or psychiatric therapy. On the other hand, institutional life may foster dependency, assault the person's sense of self-worth, encourage passivity, and possibly even lessen his chances of survival, as suggested in Foner's Aging and Society.<sup>51</sup> Moreover, many homes fail to provide facilities for privacy, activity, or social life that are "adequate" by professional or state licensing standards.<sup>53</sup>

Ironically, congregate living does not automatically enhance social relations within the institution. According to Powell, in spite of their very high encounter rate, the interaction rate of residents is relatively low.<sup>54</sup> One study specifically found that residents in a retirement home are less likely than applicants to the home to interact with friends or participate in church and com-

munity activities outside the home.<sup>55</sup> There are of course extreme cases such as one described by Robert Newcomer, now preceptor of Andrus Gerontology Center:

When I worked in a hospital geriatric ward, we almost never took our patients outside, not even on the porch. We kept them constrained in their beds all day long. If for some "unexplainable" reason they became agitated or restless, they were tranquilized. Perhaps changing their environment would have been a better remedy.<sup>56</sup>

It has been claimed that the withdrawal that observers notice in old-age homes is more a product of the institutional environment than of the aging process itself.<sup>57</sup> Numerous demonstration projects have shown that when the environment is made more stimulating, residents who were previously assumed to be physically or mentally incapacitated and apathetic often become much more active and involved in the world around them.<sup>58</sup>

#### THE LOCATION OF INSTITUTIONS FOR THE ELDERLY

Detailed comprehensive studies of the locations of elderly institutions are non-existent, but many general observations have been made. The majority of examinations show that, by and large, the aged prefer a central urban site to a rural one.<sup>59</sup> Further, in recent years architects and urban planners are gradually accepting the fact that - among other considerations, which in the final analysis often proves to be overriding - housing for the elderly should be in active areas, close to facilities and services.<sup>60</sup>

One experienced administrator for a long-term care institution humorously commented that there should be a law prohibiting the establishment of any facilities of this kind more than three blocks away from a ten-cent store. The administrator of another large home mentioned the shock that he felt and the new understanding that came to him when he first observed the chronically ill and disabled residents of one unit, excitedly, apparently happily, watching the procession form in the courtyard of a funeral parlor under

their windows while they made wagers on whether the procession would have more cars or there would be fewer flowers than on the last occasion.<sup>61</sup>

In Switzerland the elderly seem to prefer a lively neighborhood to a lonely site on the border of a wood. In fact, Steger claimed that the need of the aged to participate in everyday life appears to become greater the more their condition enforces them to inactivity. He provided some typical examples: One recreation room has large windows on the south side overlooking a beautiful garden, while on the north is the entrance to the residence. All chairs are always placed with their backs to the south, as the residents prefer to look out at the entrance. In the case of another home on an isolated site, many inhabitants walk daily three quarters of a mile to a tramway terminal even when the weather is bad, and then stay there the whole afternoon. In yet another home, the people often quarrel about the use of the chairs that are located near the main road.<sup>62</sup> Nicholson sums it up neatly:

In most instances, the patients prefer some activity in the immediate vicinity and, if given an opportunity, will reject the facilities that are isolated in an area where there is nothing to look at but a beautiful view--no matter how attractive it may seem to others.<sup>63</sup>

It is important, however, to conclude with the consideration that although a "home" might be conveniently located near the central part of town and easily accessible to public transit, an institution staff which does not encourage the inmates to take advantage of these opportunities can nullify the effects of the institution's location and cause the residents to become isolated from the community.

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## Chapter 2

### REVIEW OF THE LITERATURE AND METHODOLOGY

This chapter consists of a review of the literature associated with the spatial behavior of the elderly and the effect of residential location upon it as well as the statement of the problem and the methodological approach and implementation. It first places "spatial behavior" in a literary context, followed by a description of the literature related to the effect of residential location upon spatial behavior. It next examines the literature devoted specifically to the elderly, including their spatial behavior, the various aspects of a trip, and residential location. A synthesis of the literature follows. With the background to the problem completed, the problem statement is presented, followed by the method of approach to the survey, including the study area, definition of the sample, survey design, and techniques of analysis, and the "expected results."

### DEFINITION OF SPATIAL BEHAVIOR

Spatial behavior is commonly viewed by geographers "as an observable activity and particularly as the movement of phenomena between places."<sup>1</sup> According to Tindal, "the way that individuals behave in certain environmental settings may be referred to as spatial behavior."<sup>2</sup> This definition parallels Rushton's concept of "behavior in space," denoted as "the description of the actual spatial choices made in a particular system."<sup>3</sup>

Spatial behavior was previously described in this study as "daily trip activity," or more precisely, spatial movements to and from the residence for any purpose, e.g., going shopping, attending a sporting event, taking a walk, going to the doctor, or visiting friends or relatives,

## THE EFFECT OF LOCATION ON SPATIAL BEHAVIOR

Kutter claimed that analysis of empirical data exhibits evidence that the time budget and daily movement patterns of an individual are primarily determined by age and sex.<sup>4</sup> He hypothesized that "individual criteria of persons are of greater relevance to the individual travel behavior than location criteria,"<sup>5</sup> i.e., the socioeconomic traits of a person are of more import than the location of his residence in "daily trip activity" decisions.

In the geographic literature, Nysteuin advocated that movement or travel behavior is the complement of location. In other words, spatial behavior is in part determined by the arrangements of facilities and in part determines that arrangement.<sup>6</sup> Berry wrote that

...it is more general to argue for a mutual equilibrium or spatial structure and spatial behavior in a state of complex interdependency. Thus, in the context of ongoing spatial processes, behavioral changes may call forth structural changes, as well as the converse.<sup>7</sup>

Rushton said simply that changes in spatial structure elicit changes in spatial behavior and vice-versa. He added, therefore, that those selecting locations for facilities perceive and project the behavior patterns of individuals themselves to their perceptions of the location of facilities.<sup>8</sup>

Horton illuminated the role played by "residential" location in his theory of urban "action spaces." Action space was delineated as the area with which a person indicates he is familiar, including those areas within which most of his spatial behavior takes place, as well as that which encompasses potential interaction areas.<sup>19</sup> Horton stipulated that the important components in the action space formation process are socioeconomic attributes, travel preferences, residential location, cognitive image of urban spatial structure, length of residence at location, the objective spatial structure of the urban environment, and activity space. In the

analysis of his findings he discovered that action spaces very closely reflect the objective urban spatial structure,<sup>10</sup> or rather the location of a residence relative to the actual locations of potential activities and their associated objective levels of attractiveness within an urban area.<sup>11</sup> The residence is the origin from which the "macro" spatial structure of the urban area is utilized. "Hence researchers attempting to develop behavioral theory might find it advantageous to view urban spatial structure in terms of the location whose behavior is being studied," a viewpoint adopted in this thesis.<sup>12</sup>

In summation, in the growing geographic literature concerned with the effect of location on spatial behavior, most researchers concur that spatial behavior is partly caused by the arrangement of facilities and in part causes that arrangement. Horton points the way in an important and relatively uncharted direction, in that most "location" studies deal with the location of facilities such as factories or shopping centers and their effect on behavioral processes rather than the effect of residence location on spatial behavior as examined in this paper.

#### SPATIAL BEHAVIOR OF THE ELDERLY

The first major scholarly publication dealing with the spatial behavior of the aged was a 1970 book, Spatial Behavior of Older People.<sup>13</sup> It is of value in that it documented the importance of the utilization of space by the elderly population. However, it primarily was devoted to spatial behavior in "micro-spaces," focusing on architectural and personal space. Nevertheless "macro-space" utilization was examined by several of the contributing authors, notably by Gelwicks and Stea in articles concerned with home range, and by Calhoun, who conducted several

studies with young and old rats to determine their utilization of space,

Geographers have philosophized at length regarding the concept of home range, but attempted few scientific examinations. Stea characterized home range as "spaces which can be non-connected and potentially visitable, as contrasted with 'territory' which is ordinarily defined as space which is highly controlled and even 'staked out'."<sup>14</sup>

According to Gelwicks, a prominent gerontologist who specifically studied home range and the use of space by the elderly, "Home range is a dimension which may have particular significance for the elderly individual but it has, to date, received very little attention." He defined home range as "an amoeboid signature whose pattern is formed by a series of behavior settings oriented towards a predominant locus of activity (usually the place of residence), and connected by significant linkages," Stated simply, home range is the series of linkages and settings traversed and occupied by an individual in his normal activities. Gelwicks added that physical mobility and transportation play a major role in determining the boundaries of the home range.<sup>15</sup> He observed that the aging individual, particularly upon entering an institution, may for the first time in his life come to the realization that he no longer has the opportunity for either choice or change in his lifestyle or "daily trip activity" options. He concluded that the opportunity for choice and change in spatial behavior within the home range may be vital to the health and well-being of such a person.<sup>16</sup>

Calhoun focused on the factors of distance and time related to excursions for food and other purposes into the surrounding environment. The findings confirmed that young rats make more frequent trips and for longer time periods. However, he discovered that structuring the environment

with meaningful stimuli produces an increase in the number of excursions for both young and old rats. Calhoun concluded that the relevance of his work

to the situation in which aging humans live requires stating a value judgement as to objectives, i.e., structuring the environment with situations potentially capable of illiciting responses which will increase a) the duration of periods of locomotion and b) the frequency with which excursions are made out into the environment from the place where resting or self-directed activities normally transpire.<sup>17</sup>

Utilizing data from a mid-sixties Toronto transportation study, Golant's 1972 doctoral dissertation, "The Residential Location and Spatial Behavior of the Elderly: A Canadian Sample," was the first and most far-reaching geographical effort to date pertaining to the problem.<sup>18</sup> Much of our present understanding of the spatial behavior of the aged derived from this work. Through careful empirical analysis of residential patterns and moves and of daily trip behavior of both the late middle-age and elderly populations, though within a context of theories of aging and of some features of urban spatial structure, Golant presented valuable insights into the travel behavior and constraints on the mobility of senior citizens.

In brief, he found a central city bias in residential location, but not to the degree theory has suggested. His analysis of residential mobility and immobility revealed more variability than generally recognized, along with the importance of socioeconomic status, primarily income. Golant furthermore established that increased age results in dramatic and undesired loss of mobility for all but the high income elderly. He especially noted the particularly disastrous consequences ensuing from the decline in public transportation facilities upon the spatial behavior of the aged.



Especially relevant to this thesis effort was his spatial analysis of trip activity, which revealed considerable zonal variation which was only partially attributable to socioeconomic variation. However, his attempt to explain this variation by relating it to a set of location variables was largely unsuccessful. But there was a fairly strong relationship between his location variables and mass transit, trip generation, thereby suggesting that the characteristics of a location are more important for the user of public transportation than for the auto user.<sup>19</sup>

One other geographical examination, Hanson's dissertation on the travel patterns of elderly households in Uppsala, Sweden, deserves special mention.<sup>20</sup> His dissertation and longitudinal study, "Travel Patterns of Elderly Households in Uppsala, Sweden," first compared the residential distribution of the aged with that of the rest of the population, concluding that there was no difference in the two distributions. He moreover found the accessibility of the elderly to a selected set of opportunities (grocery stores) to be the same as the accessibility of the rest of the population to these same opportunities. In comparing the actual travel of the aged with the spatial behavior of the rest of the population, Hanson discovered that elderly households make fewer trips than younger households, with the trip destinations located closer to the residence than the destinations of other households.

#### DAILY TRIP ACTIVITY

The following "daily trip activity" section overviews the literature associated with the various aspects of a "trip,"

a trip for this analysis is described as being initiated when an individual leaves the residence or institution and terminated when he returns. Implied in "trip type" is whether or not the trip in

question is single-purpose or multi-purpose. On a single-purpose trip only one stop is made, whereas on a multi-purpose trip two or more stops are executed between the time the subject leaves and returns home.<sup>21</sup>

Wheeler found that multi-purpose trips comprise a quarter to a third of the urban travel of the general population.<sup>22</sup> Though only Hanson examined this aspect of the spatial behavior of the aged, several studies confirmed that the handicapped--including a large percentage of elderly--are less likely than others to make multiple-purpose trips.<sup>23</sup> However, in Hanson's analysis exactly fifty-six percent of the total trips of both the under sixty-five population and the elderly population were single-purpose. But he conceded that the older person is less likely to undertake lengthy multiple-purpose trips.<sup>24</sup>

Trip purposes of the elderly are fairly well documented. With increased age there is obviously a decrease in the relative importance of work trips, but also an increase in the relative importance of shopping, social, and recreational trips.<sup>25</sup> In fact, Hanson said that "the social trip is made slightly more frequently by the elderly than by others."<sup>26</sup> Golant, in a consideration of only nonwork trips in Toronto, found that shopping trips have the greatest relative importance followed in order by social, personal business, and recreation trips.<sup>27</sup> Markovitz concluded that work, shopping, and personal business trips are more frequent among higher income groups while the number of social and recreation trips remains constant for various income levels.<sup>28</sup> However, Golant discovered considerable variation between the two groups, specifically that the high income elderly engage in far more frequent social, shopping, and recreation trips than low-income aged.<sup>29</sup>

While trip frequency has often been studied with contradictory

findings most researchers have concluded that the frequency of trips decreases with increased age.<sup>30</sup> Markovitz reported that more trips for any purpose are made per person in the total population than by the aged.<sup>31</sup> Hanson stipulated that in Uppsala elderly households execute significantly fewer trips than younger households.<sup>32</sup> However, in their survey of six urban centers, Ashford and Holloway specified that the number of trips generated per tripmaker is almost the same for all age groups, trip frequency falling off and only slightly for the older.<sup>33</sup>

As these conflicting results reflect the "average" elderly individual, more insight was gained in more detailed analyses utilizing income indices. Overall, studies showed that trip frequency parallels income level, decreasing with decreasing income.<sup>34</sup> This probably resulted from inability to pay for transportation, as well as inability to spend money at the destination.

In Canada, eliminating the work trip, Golant found that high income elderly heads of households make almost twice as many trips as late middle-age heads of households. Yet low income households show a slight decline in trips. In general, he concluded that increasing years result in a large as well as unwanted loss of mobility for all but the high income elderly.<sup>35</sup>

Associated with the income variable is automobile availability and driver's license possession. One researcher established that, although in the total population trip rates are twice as high for drivers as non-drivers, aged drivers average four times the trips of elderly non-drivers. She further said that among high income elderly, the trip frequency of drivers is significantly higher than non-drivers.<sup>36</sup> Surprisingly, for those dependent on public transportation, Markovitz concluded that trip frequency does not vary with income.<sup>37</sup>

It has been observed that empirical analysis shows a decline in importance in usage of the automobile by the elderly with decreased income, and increased public transportation dependence.<sup>38</sup> One study found that only one-third of the sample drove. Over fifty percent depended upon public transit--though most used it only infrequently.<sup>39</sup> In Toronto Golant discovered that transit trips per person either remain constant or decrease with increased age, while driving trips per person decrease at an even greater rate.<sup>40</sup>

By sex, male drivers are far more likely than female drivers to use the car as their dominant mode of transportation.<sup>41</sup> Golant's study of the aged and late middle-age populations revealed that mass transit is of greatest importance to the elderly female, nonhead of a residence, the elderly widow, and elderly low-income heads of households. He further found the utilization of the taxi to be so small as to be insignificant.<sup>42</sup>

The literature suggested that an important alternative to these travel modes is riding in a car as a passenger. In San Antonio Carp observed that those who most often rode as automobile passengers were also those with the least economic, physical, and social resources for mass transit or walking. She stated that one-third of all trips are as auto passengers, with the large majority of elderly given rides at least occasionally.<sup>43</sup>

Few existing studies even recognized walking as a valid transportation mode. However, there was some evidence to indicate that urban elderly take more short walking trips than the rest of the population and may be more dependent on walking as a primary transportation mode. This pedestrian travel is principally utilized for very short neighborhood trips during daylight hours.<sup>44</sup>

In another of Carp's many articles on elderly travel behavior, she stated that forty-four percent use walking as a mode of transportation at least two or three times a week, while twenty percent usually go somewhere "on foot" every day. But then, almost one-half of her sample rarely or never resort to walking.<sup>45</sup> Yet a survey of participants in New York's Reduced Fare Program found that only a third of their trips involve public transit. The majority of all trips taken are still walking trips "to neighborhood food markets, to church, to acquire medical care, or simply to take a walk in the neighborhood."<sup>46</sup>

The literature review revealed an interesting relationship between the frequency of usage of a travel mode and evaluation of it. For automobile driving, frequency and satisfaction are related positively. Those who drive the most are the most pleased with it as a transportation mode. For public transit and for walking, the relationship is reversed. The more an elderly person walks or rides the bus, the more negative is his evaluation of it as a way to get places.<sup>47</sup>

Almost nothing has been written about the time of day trips are undertaken, although it might be predicted that fewer trips would be initiated by the elderly during peak travel periods and after dark. In one notable exception, Golant claimed that public transportation trips in Toronto are more likely to start earlier in the day than auto trips and less likely to start in the afternoon rush hour or in the evening. In his consideration of both the automobile and mass transit, he found the elderly more likely than his control group to avoid starting nonwork trips during the early morning rush hour period. Drivers are especially inclined to initiate trips earlier in the day to avoid the late hours. Social and recreation trips, while more evenly distributed throughout the day, have both nine A.M. to four P.M., and after six P.M. departure peaks.<sup>48</sup>

For another relatively unstudied measure of spatial behavior, the time duration of trips, Golant noted considerable variation depending on the trip purpose and travel mode. Irrespective of the purpose of the trip, as would be assumed, he found the travel time to reach a destination by public transportation to be considerably longer than by automobile. In general, the average time to complete a social or recreation trip is the longest, followed by work trips, and then by personal business and shopping trips.<sup>49</sup>

One important aspect of spatial behavior, trip length--dependent upon residential location and urban structure--is especially crucial in attempting to assess the elderly's accessibility to opportunities. Most analyses were not only quite general, but also conflicting, with information on actual distance parameters (in miles) extremely limited. Surprisingly, Golant neglected even to take "trip length" into consideration in his Toronto effort.

Ashford and Holloway found the average distance traveled on trips by the elderly to be the same as that of other age groups. Moreover, "...as age increased, the percentage of trips made intra-zonally declined, refuting a widespread belief that as a person ages he is more likely to restrict his travel to his immediate environs."<sup>50</sup> Yet one study reported limited travel among the aged, with their spatial patterns more distinctly bounded than those of the rest of the population. It claimed that the immediate neighborhood was the home range of many elderly.<sup>51</sup>

In Hanson's detailed analysis of Uppsala, where both the elderly and the rest of the population were located similarly with respect to "access to opportunities," he found that the mean of the distance in kilometers traveled on all trips was 3,180 for the aged, and 4,638 for the rest of the population.<sup>52</sup> His results indicate that the elderly distance-minimize,

the friction of distance posing a greater obstacle to travel for them than for the rest of the population. However, one cannot help but wonder how much the general population's "work trips"--sometimes lengthy--affected these results. A more valid analysis would eliminate this journey to work, something neglected by every single examination.

Hanson did adequately inspect "grocery trips," by segregating them from other trips. He found the mean of the distances travelled to grocery stores to be 1.082 miles for the elderly, and .989 for the rest of the population. He therefore concluded that when shopping for food, the elderly choose their destinations much the same way as do the rest of the population. Hanson also felt that it reflected the fact that many aged depend on others for transportation, which may not often be offered for purposes deemed "less necessary" than buying groceries.<sup>53</sup>

Another survey worth noting is that executed by the Philadelphia City Planning Commission, which examined average walking distances from the residence to frequently used services desired by the elderly. For groceries, they discovered a distance of one block is most desirable, two blocks considered critical distance for maximum comfort. Optimum distance for medical services has to be "on site," one-half mile critical distance. Public transit stops are also wanted on site, one block being the farthest the aged want to walk to reach mass transit. The value of this type of research in trying to solve the "access to opportunities" problems of the elderly is obvious.<sup>54</sup>

Studies ascertaining accompaniment for the elderly on daily trip activity by friends, relatives, neighbors, or others were virtually non-existent. Yet this information would be of value in determining if some trips might be unexecuted due to lack of physical, social, or even psychological support for the aged and feeble man.

## RESIDENTIAL LOCATION OF THE AGED

According to one analysis, theory regarding the residential distribution of the aged has come indirectly from sources such as the classical land use models of Hoyt and Burgess, extended by Harris and Ullman.<sup>55</sup> It further resulted from housing market structure research by Grigsby as well as classical urban rent theory by land economists Hurd and Ratcliffe, extended by Alonso.<sup>56</sup> The social area or factorial ecology analyses of Bell and Shevky, later extended by Berry and others, also contributed.<sup>57</sup> In brief, these works revealed the close relationship between residential morphology, the workings of the housing market, and changing needs and desires associated with advancing age. Berry and Horton clarified the especially important relationship between location rent and residential spatial structure:

At the center of the city, land values are such as to necessitate capital-intensive land; if it is residential land, this necessity means apartments. Further from the city center where land values are lower (because location rent has decreased), more land and less capital need be used; thus two family and town houses are found. At yet further distances where the land cost yet lower, single family homes predominate.<sup>58</sup>

Densities of residential land use decline with increased distance from the city core. The advantages of larger residential sites are substituted for the disadvantages of decreasing accessibility.<sup>59</sup>

Childless families, the old, and single people who need less dwelling and site space are likely to have apartments near the city center, selected for greater accessibility to central city facilities. With the arrival of children, families frequently migrate to the suburbs for more site space and larger living quarters. When these offspring leave home, or perhaps at the ensuement of retirement or after the death of a spouse, large residences are again no longer required; and there may be



a move back toward the central city into a smaller house or a multiple family dwelling. With population groups at various stages of the life cycle located at their respective distances from the city center, a concentric pattern results. With regard to the older population, in which that they are concentrated nearer to the city center, numbers declining with increased distance.<sup>60</sup>

In fact, most socioeconomic analyses of the elderly operated under the assumption that the aged are concentrated in the central cities. For example, the flavor of remarks were "...most of the elderly live in the inner city portions of urban areas... "The aged also, like certain minority groups tend to be concentrated in rural areas and in the central city and are under-represented in the suburbs."<sup>61</sup> Further, geographical age-cohort studies of urban areas have revealed a broad concentric patterning with the aged concentrated in the inner city.<sup>62</sup> A 1969 Census Bureau survey found that approximately three-fifths of the elderly population live in metropolitan areas and more than half of those live within the central city.<sup>63</sup>

However, there are very few systematic, empirical analyses regarding the present intraurban distribution of the aged or about the relative importance they attach to "access to opportunities" in selecting their residences. Although highly general in approach, some United States studies have been examined for elderly residential location. A Pittsburgh survey revealed that while residences of the aged are not especially clustered, they are more often in the inner city than in the suburbs.<sup>64</sup> A similar pattern exists in New York City, but distinct clustering is found in San Francisco, henceforth labeled "the geriatric ghetto."<sup>65</sup> Yet Hoel claimed that the aged, desiring easy transit access, usually live in corridors along the major radials emanating from the city center.<sup>66</sup>

The only detailed United States investigation was conducted by geographers Hiltner and Smith. Their computation of the correlation between the percentage of the Toledo elderly and non-elderly populations in each tract of four census enumerations casts some doubt on the classical theory of elderly central city location.<sup>67</sup>

The analysis of the spatial distribution of the aged population of Toledo provided some support for the hypothesis that the elderly are concentrated in the central city or sections of it. Although the elderly may be more visible in the inner city due to a small population base and the outmigration of younger age groups, the distribution of the elderly is not statistically significantly different from the distribution of the non-elderly population (emphasis mine).<sup>68</sup>

In brief, although a slight concentration of the aged exists in the city centers, their distribution is closely related to the distribution of the rest of the population. Furthermore, the investigators found them to be much less segregated than the black population.<sup>69</sup>

Geographic investigations of elderly distribution conducted in cities outside the U.S. also revealed conflicting results. In Wellington, New Zealand Johnston noted "the senile CBD," although dominated by adults under sixty-five, it contains a fairly large number of aged. "The old zone," which has a somewhat smaller proportion of elderly, encircles the CBD. Surrounding this is the "nature zone," characterized by an even distribution of all aged. Considerably smaller percentages of those over sixty-four reside in remaining zones. He cited similar distributions in other New Zealand cities, as well as for Australia.<sup>70</sup>

Golant's study of Toronto revealed a central city bias in residence selection by the aged, but not to the degree that theory suggested.<sup>71</sup> However, in direct contradiction was Hanson's analysis of Uppsala, Sweden, which shows no difference whatsoever in the distribution of the elderly and the rest of the population.<sup>72</sup>

Although the role of proximity to resources has not been fully explored, for the general population it has been found that neighborhood and dwelling characteristics are far more important in residence selection than is "access to opportunities."<sup>73</sup> Existing empirical data was hard to interpret for the elderly population, chiefly because the sample areas, survey methods, and timing and interview schedule structures varied so greatly. Golant's Toronto study showed that in aged residence selection, accessibility to public transit, the neighborhood, shopping facilities, and house costs are the most important factors, while nearness to friends and relatives and church are not considered very important.<sup>74</sup>

However, in the United States Donahue emphasized the importance the aged attach to having close proximity to community services and to friends and relatives.<sup>75</sup> A New York City study - with an auto-oriented sample- found accessibility to relatives is the most important, with little interest expressed in the closeness of movies, parks, or libraries. Women desire closer proximity to people and facilities than do males, especially food stores, relatives, and church. Overall, nearness to grocery stores is not rated as important, as they tend to shop out of their neighborhoods.<sup>76</sup>

Wilson found the "neighborhood" to be of major importance, although the concept varies with different people. His definition is:

a residential area, including at least six blocks, essentially homogenous in structural character, with ill-defined boundaries, but with relatively high consensus about which service facilities (schools, shopping districts, etc.) "belong" to the neighborhood.<sup>77</sup>

Friendliness, familiarity, and privacy are rated the most important neighborhood characteristics. Also listed as important by Wilson, are proximity to church, a shopping center, and public transit.<sup>78</sup>

## SYNTHESIS OF THE LITERATURE

Innumerable books and articles have been published on the topic of aging. However, they are predominantly generalized views of the major concerns of growing older as perceived by behavioral scientists such as gerontologists, sociologists, and psychiatrists. Literature on the spatial behavior of the elderly and the effect of location upon it is not only extremely limited but often conflicting. A surprising number of researchers overlook age as an issue relevant to daily trip activity. The majority of examinations are rather cursory and general in approach, utilizing small population samples, frequently without adequate statistical control. They commonly fail to produce results which could be compared to other study situations and neglect the relative behavior of the sampled aged in reference to the rest of the population. Further, current studies are predominantly transportation-oriented and virtually none focus on the spatial behavior--or the effect of location upon it--of the residents of old-age homes and those elderly in small or medium-sized communities.

It is only in recent years that "spatial behavior" as a subject worth analysis has earned the attention that it deserves from geographers. The idea of "behavior in space" took root in studies associated with "home range" and similar concepts. Urban travel studies and assessment of the effect of location of facilities such as shopping centers on behavioral processes are pioneer efforts. Horton emphasized the importance of viewing spatial behavior relative to residence location. The effect of residence location on spatial behavior is an aspect of daily trip activity that has just come under consideration. Few studies face the question directly, Golant and Hanson being noteworthy exceptions.

The first major contribution to the literature of "elderly" spatial behavior was the aforementioned book, Spatial Behavior of Older People, specifically Calhoun's study of the use of space by rats and the research on home range and the use of space. Following this effort, the literature directly dealing with the daily trip activity of the aged has grown slowly. The previously described analyses of Golant and Hanson led the way among geographers in all phases of the "geography of the elderly."

Some aspects of aged daily trip activity were fairly well documented and accepted. Most research concerned with "mode of travel" concludes that with increased age there is a decline in the use of automobile and an increase in the use of public transit, though most studies fail to include pedestrian transportation. It is acknowledge that "trip frequency" decreases with additional years, but increased with income or automobile availability.

There is concurrence that age brings a decline in work trips, along with the importance of shopping, social, and recreational trips. However, a common failing in most studies of "trip purpose," excepting those of Hanson and Golant, involves a failure to utilize a more finely devised categorization than the mere shopping, work, or recreational divisions. Thus we have little insight into the social versus the consumption aspects of shopping.

Nonetheless, many voids exist in the daily trip activity literature. "Trip type" is only considered by Hanson, while "time of day trips taken" and the "time duration of trips" are relatively unstudied except in Golant's Toronto analysis. A major void is that of "trip length," important in assessing "access to opportunities." Studies are very general and conflicting. More and more detailed research is essential. Some analysts claim that the elderly distance-minimize, while others

heartily disagree. Little attention has been given to distance in "miles." All fail to exclude the work trip from the general and older population.

As for literature concerned with the actual residential location of the aged, there is a great deal of classical theory concurring that the old are clustered in the city center, numbers decreasing with increasing distance. Few systematic empirical analyses exist, although there are many general surveys. Most examinations agree with the theory that the elderly are predominantly located in the inner cities, although there is definitely disagreement such as Hanson's Uppsala study and that of Hiltner and Smith.

More empirical data is also necessary to assess the importance of "access to opportunities" in residence selection by the aged. There is conflict in the literature regarding what "opportunities" the elderly would prefer near their homes.

From this examination of the literature many important questions arise. Exactly what are the accessibility preferences of the aged? Are they located closer to or farther from "opportunities" than the rest of the population? And the question this thesis primarily addresses, how does the residential location of the aged affect their spatial behavior? Answers to questions such as these are essential before solutions to the "access to opportunities" problem of the elderly can be implemented.

Inherent in this study is the premise that location is relative to innumerable factors which cause mobility to decrease with the various increases in "effective distance." One of the most important of these is "access to transportation." To illustrate, the Senior Citizen Center might well be located on the moon instead of three miles away if typical aged persons of low income has only the option of taking a taxi at the cost of two dollars, much less taking into consideration his waiting

time for the cab or the aggravation to his emphysema by the driver's pipe. Included among other "effective distance" factors of consequence are age and health, income and other socioeconomic characteristics, the provision of needs and desires by relatives, friends, or other visitors, and knowledge of the location of goods, services, and social opportunities available in the community. A wealthy ambulatory individual is more likely to take in a weekly movie than a person in a wheelchair on a fixed low income.

In light of these considerations, this research effort primarily examines spatial behavior associated with the aging process, the availability of transportation, and socioeconomic status, versus the effect of the physical location of institutions for the elderly upon spatial behavior. Precisely what effect do these various factors in this complicated "aspatial-spatial" interrelationship have on the generation and characterization of daily trip activity?

Resolutions are aided by an inquiry into how the senior citizen appraises his spatial behavior. Is he satisfied with his present daily trip activity, or does he perhaps desire easily accessible low-cost transportation, or prefer to live closer to certain urban functions? To illuminate further, would he prefer to be within walking distance of the church of his choice, or would a bus-stop at the corner adequately serve his needs?

Following the analysis, special consideration is given to steps which can be taken to bridge the gap between existing and desired daily trip activity to provide "access to opportunities" for the elderly. More specifically, the research answers these questions; How does spatial behavior differ among variously located institutions? Are differences in daily trip activity among the "homes" due to actual institution location,

or variables such as those associated with the aging process or socio-economic characteristics? Where do the aged go, and is there a relationship between distance to the destination and the travel mode and purpose of trips? Are these elderly in the Manhattan community affected by the friction of distance, and do they distance-minimize?

#### JUSTIFICATION OF THE RESEARCH PROBLEM

As previously explained, the changing role of the elderly in our urban, industrialized society necessitate a reassessment of how we house our aged, concomitant with problems reaching crisis proportions with respect to how needed and desired goods, services, or social opportunities are located in the environment. The "accessibility to opportunities" problem is especially pronounced in small to medium sized communities such as Manhattan, Kansas. Further, it is claimed that the lifestyle patterns of the aged in such communities result in needs and desires sufficiently different from metropolitan areas to warrant special consideration if there is to be effective solutions to their problems.<sup>79</sup> Even more affected by inaccessibility are those individuals residing in institutions for the elderly who suffer the most directly from lack of access to community resources when poorly located. Moreover, no systematic analysis of their problem exists.

While sociologists, gerontologists, and other social scientists have examined aspects of the elderly's "access to opportunities" problem, they have basically overlooked the effect of residence location upon spatial behavior. As asking questions about location is one of the distinguishing characteristics of geography, the effect of institution location upon the spatial behavior of elderly residents is a geographical question meriting serious



attention. Understandably, geographers are already interested in the study of spatial behavior, and to a very limited degree the spatial behavior of the elderly. A study of the effect of location upon the spatial behavior of the residents of institutions for the elderly is necessary for future planning of improved accessibility to needed and desired destinations.

#### METHOD OF APPROACH

##### Study Area

The areal focus selected for this research effort is the Manhattan, Kansas community. Having experienced a sustained residential growth while retaining the pleasant, relaxed atmosphere of a "college town," it is a second class city of 27,575, the county seat of Riley county, and a major trading center for the surrounding rural community.<sup>80</sup> Manhattan has a high percentage of its total 3,684.2 acres in residential as well as commercial useage, but land put to industrial uses is considerably lower than in most cities of comparable size in the state.<sup>81</sup> Manhattan's street system is basically a grid pattern, excepting the more recent additions developed under the modern concept of curbed streets.<sup>82</sup>

The city has two distinctive commercial areas as well as out-lying shopping clusters, including Westloop Shopping Center, Village Plaza, and Blue Hills Shopping Center (Fig. 1). The downtown is located in the south-east quadrant, acting as the CBD and generally serving the larger population. For analytical purposes, the CBD is delineated as generally bounded by Juliette Street, Osage Street, Colorado Street, and on the east the Union Pacific railroad spur. Of comparatively smaller scale is the Ag-

gieville commercial area southeast of the Kansas State University campus, serving the student body as well as nearby residents. Partly owing to its "artificial" student population, Manhattan is the most densely populated city in the state. 7.9 percent, or 2,194 of its residents can be classified as "elderly."<sup>83</sup>

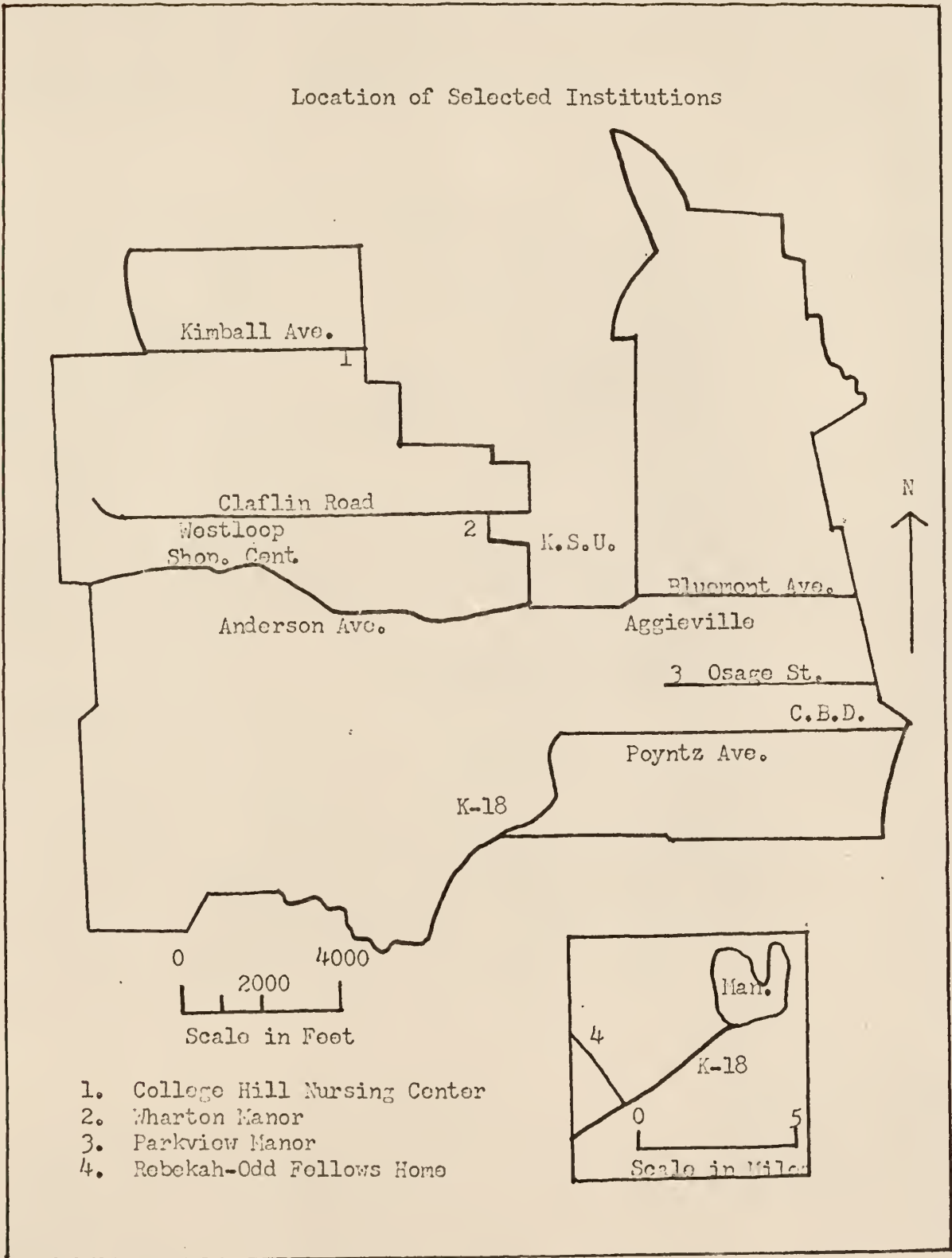
#### Definition of the sample

There are six institutions for the elderly in the Manhattan area. Two nursing homes and two rest homes were selected for this investigation. (Excluded for having a population under ten, were Sunset Rest Home and Winfrey Rest Home.)

College Hill Nursing Center is a large private nursing home with eighty-eight residents, located at 2423 Kimball in northwest Manhattan, an intermediate distance from shopping facilities, but most distant from the CBD. Wharton Manor, with sixty-two residents, is another private nursing home. It is located in approximately the center of town, west of Kansas State University, at Sunset and Claflin Road. Wharton Manor also is at an intermediate distance from shopping resources, closest to Westloop Shopping Center and Aggieville. Across the street from Manhattan City Park, Parkview Manor, with thirty elderly among its fifty-nine "welfare" residents, is well located with regard to access to shopping. It is only a few blocks from Aggieville, and within walking distance of downtown. Forty-eight elderly lodge members are resided at the Rebekah-Odd Fellows Home. It is remotely located southwest of Manhattan, approximately four miles southwest on K-18 and two miles northwest on a country road (See Figure 1). (page 42)

When one examines these four "residences" on the map, noting their scattered locations throughout the community as well as varying distances

Figure 1



from urban facilities, they appear ideal for the purpose of this study, i.e., to examine the effect of location on the spatial behavior of the elderly in institutions.

One-fourth of the elderly in each "home" were selected as respondents to obtain information on locational behavior, resulting in a total sample of fifty-nine persons. These were randomly chosen from a list of those aged the administrator of each institution considered not senile, and able to "make trips." Supposedly, the residents of nursing homes are more immobile than those in rest homes. However, both College Hill Nursing Center and Wharton Manor claimed their residents to be essentially the same as those in rest homes.

#### Survey Design

The means chosen to obtain the desired information from the sample members was a questionnaire-interview format, further described in Chapter 3. Following a sample testing of the questionnaire, a letter of introduction and explanation to each "residence" was followed by a phone call for official approval by the institution before proceeding. The questionnaire was administered verbally to each respondent, with answers recorded by the interviewer.

#### Techniques of Analysis

The data evaluation is divided into two segments. The first primarily consists of a summarization of the survey findings. Spatial behavior at each institution is examined, thereby demonstrating the effect of institution location upon spatial behavior. To determine if the elderly distance-minimize in their daily trip activity, their shopping and "non purposeful outings" destinations are examined to see what

patterns emerge.

The second stage of the analysis is an assessment of relationships between location and trip activity while allowing for non-locational effects. Therefore, chi square analysis is utilized to determine if a relationship exists between selected criteria, e.g., trip frequency and location or trip frequency and age. To assess the strength of associations, Pearson's contingency coefficient is used.

#### EXPECTED RESULTS

Most important from a geographic standpoint, analysis of survey data is expected to show that the location of institutions for the elderly is an important factor in spatial behavior. The trip frequency of old-age home residents is anticipated to decrease with increasing distance between institutions and opportunities. More specifically, Parkview Manor, located within walking distance of Aggieville and across the street from the Manhattan City Park, should prove to be in an especially advantaged situation. The reverse is true for Rebekah-Odd Fellows, located outside the city limits. The trip frequency of College Hill and Wharton Manor residents should fall somewhere between them.

Further, the friction of distance will probably be discovered to result in distance-minimization. However, the findings may concur with other studies which concluded that the aged do not distance-minimize with regard to trips for the purpose of shopping, but often prefer to utilize the CBD. The examination should also reveal a relationship with factors other than distance and location in elderly spatial behavior, especially mobility, income, and age.

It is anticipated that the subjects will be found to be particularly disadvantaged with regard to travel mode, even more so than observed in

the majority of aged studies that frequently show a decrease in the use of the automobile and an increase in the use of public transportation. With no public transit available in the community at the time of the survey the sample should prove to be completely "transportation dependent," dependent upon walking or upon rides from relatives or friends. As most aged no longer make work trips, trip destinations will probably be predominantly for the purpose of shopping, social calls, or for medical reasons. It is also hypothesized that few trips will be observed to have been initiated during rush hours or in the evening.

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RESULTS OF THE SURVEY

Having provided the background and definition of the research problem, the purpose of this chapter is first to describe the research questionnaire and its implementation, and then to summarize its results with the rationale that an examination of resident spatial behavior at the variously located institutions for the elderly will illustrate the effect of residence location upon spatial behavior.

DESIGN OF THE QUESTIONNAIRE

Three sections were considered essential in the formation of the questionnaire. One consisted of several questions to provide information regarding the "aging" of the subjects. The second contained questions concerned with socio-economic characteristics such as income and sex. The first two sections were included in order to ascertain if aging or socioeconomic characteristics of an individual are more important than his residence location in affecting spatial behavior. To determine spatial behavior, the third section was constructed to acquire details of the daily trip activity of the interviewees, i.e., trip frequency, travel mode, trip purpose, etc. (See Appendix). page 131.

The last section was not cross-sectional in time perspective but rather utilized a longitudinal approach. That is, it did not limit the time horizon to one day, but examined the subjects; spatial behavior for each day of the week, as well as the categories of "every two weeks," "occasionally," and "yearly." Most surveys have been limited to the time horizon of one day, thus omitting some of the most intriguing aspects of daily trip activity. For example, a cyclical nature of travel has been theorized, yet no pattern of repetitive trips can emerge from a cross-sectional study.

"Trips" were further examined on "days of the week" to help individuals to recall trips which otherwise might be forgotten, e.g., going to church on Sunday or weekly bridge parties. This minimizes reporting

"wishful thinking" trips. A study that merely asks "How often do you go shopping?" might come up with more trips than really occur.

Also included in the questionnaire were questions concerned with the subjects' knowledge of the community, the effect of bus and taxi transportation modes, visitor provision of needs and desires, desired future daily trip activity, and a rating of the respondents. It should be noted that not all the information obtained from the questionnaire-interview was incorporated in the summarization and analysis due to considerations of thesis length.

#### CONDUCTING THE INTERVIEW

Fifty-nine individuals or one-fourth of the elderly at the four selected institutions (College Hill Nursing Center, Rabekah-Odd Fellows Home, Wharton Manor, and Parkview Manor) were questioned. During the summer of 1974 interviews began with an explanation of their purpose and a request for the subject's participation. If they agreed an explanation of the interviewing procedure followed. The questions were then read and the subject's answers recorded directly on the questionnaire by the interviewer. The average interview lasted from one and one-half to two hours. This was due not only to the length of the questionnaire and the interviewer's careful explanation of the questions, but to the fact that the interviewees were reluctant to let go of their "audience."

Only two people refused to be interviewed, one because of hearing impairment.

The subjects appeared to understand and reply to

honestly. The few receiving a "poor" rating in my evaluation of the respondents were eliminated and others interviewed. Seventy-five percent of the sample were rated as "good" and 25 percent as "fair". Surprisingly questions regarding income offered the most confusion. This was probably due less to reluctance to share this information than the fact that few actually handled their own financial affairs as this was left to relatives and the institutions. The respondents also found it difficult to answer questions requiring them to rank their answers in importance from "very important" to "not important."

#### SOCIOECONOMIC CHARACTERISTICS OF THE SAMPLE

The socioeconomic profiles of the sample members will be discussed first. Of importance in the ensuing analysis is knowledge of the sex ratio of the respondents among the various homes. As is the general rule in institutions for the elderly, women were found to greatly outnumber men.<sup>1</sup> Overall, the sample was seventy-three percent female and twenty-seven percent male, fairly representative of the four residences (Table 1 page 55). Quite predictably for a small Kansas community, the random sample was 97 percent caucasian.

Eighty-one percent of those interviewed were widows or widowers, consistent with the percentages for all four locations. Only one individual was divorced. Twelve percent were single, 5 percent had spouses, and two people in the sample were married to each other and resided in the same home. Thirty-two percent had no living children, which was representative except for Parkview Manor, atypical with sixty-three percent. This lack of family ties might help account for the fact that Parkview Manor's residents were placed there by the county, a

situation to be examined later. Forty-seven percent had one to three living children, although it ranged all the way from twenty-five percent in Parkview Manor to fifty-nine percent in College Hill. Seventeen percent had four to five living children with a spread of twenty-six percentage points among the homes. Only two people had six or more children, the most being twelve.

The largest category of subjects, forty-four percent, had from six to eight years of education. Thirty-four percent had high school diplomas, and Bachelor Degrees were held by seven percent. The residents of College Hill had the highest percentage of degrees, followed in order by Rebekah-Odd Fellows, Parkview Manor, and Wharton Manor.

Due to the overwhelming majority of women in old-age homes, the sample was forty-seven percent ex-housewives, although there was moderate variation among the institutions. Twenty-five percent had been blue collar workers, but this classification ranged all the way from sixty-three percent in Parkview Manor to fourteen percent in College Hill. Most male respondents reported they were farmers, white collar workers, professionals, and entrepreneurs, in that order of frequency. Of note is the fact that Parkview Manor's residents fell into only two categories, thirty-eight percent ex-housewives and sixty-two percent retired blue collar workers.

The procedure for patient care payment--many subjects claiming never to see any of their money--made it difficult for the respondents to estimate their present income. Ten percent of those interviewed did not even try. Disadvantaged financially like most elderly, fifty-nine percent estimated they have a yearly income of under \$2,000, with twenty-nine percent in the \$2,000 - \$3,999 category (Table 2) (page 55). Only one person had an income in the \$8,000 - \$9,999 range. There was wide variation in the first two income categories among the institutions, Col-

Table 1  
Sex of the Sample

Institution	Male		Female	
	No.	Percent	No.	Percent
College Hill	7	32	15	68
Wharton Manor	5	31	11	69
Rebekah-Odd Fellows	2	15	11	85
Parkview Manor	2	25	6	75
Total	16	27	43	73

Source: Survey data

Table 2  
Yearly Income of the Sample

Institution	Under \$1,999		\$2,000-\$3,999		\$8,000-\$9,999		No Reply	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
College Hill	7	32	10	45	1	5	4	18
Wharton Manor	8	50	7	44	0	0	1	6
Rebekah-Odd Fellows	13	100	0	0	0	0	0	0
Parkview Manor	7	88	0	0	0	0	1	13
Overall	35	59	17	29	1	2	6	10

Source: Survey data



lege Hill residents had the highest incomes, followed in order by Wharton Manor, Rebe<sup>k</sup>ah-Odd Fellows, and Parkview Manor.

Only fourteen percent, even lower than in the general elderly population, still possessed driver's licenses, though oddly this ranged from twenty-five percent in Parkview Manor to none in Wharton Manor.<sup>2</sup> Only two individuals currently owned cars, and they were both kept by out-of-town children. This contrasts with the Senate study showing fifty-five percent of all aged heads of households possessing automobiles.<sup>3</sup> In sum, not one person had personal access to a vehicle "as driver." This finding was expected among institutionalized elderly, but was much to the chagrin of those interviewed who still considered themselves capable of driving.

#### "AGING VARIABLES"

To facilitate understanding and further analysis, it is imperative to include variables associated with aging when examining the effect of location on the spatial behavior of the elderly. The youngest person interviewed was sixty-five and the oldest ninety-four (Table 3) (page 57). Nationally, the average resident of institutions for the elderly is just under eighty-five.<sup>4</sup> With wide variation in ages among the homes, twenty-two percent were in the 65-74 age group, forty-four percent were 75-84, and thirty-one percent were 85 or older. Two subjects were unsure of their age. Astonishingly, sixty-three percent considered themselves to be in good health, varying from seventy-seven percent at Rebe<sup>k</sup>ah-Odd Fellows to fifty percent at Parkview Manor (Table 4) (page 57). Thirty-six percent thought that they were in fair health, and only one person thought his health was poor,

Table 3  
Age of the Sample

Institution	65-74		75-84		85 and above		No Reply	
	No.	Per- cent	No.	Per- cent	No.	Per- cent	No.	Per- cent
College Hill	3	14	12	55	5	23	2	9
Wharton Manor	3	19	4	25	9	56	0	0
Rebekah-Odd Fellows	3	23	6	46	4	31	0	0
Parkview Manor	4	50	4	50	0	0	0	0
Overall	13	22	26	44	18	31	2	3

Source: Survey data

Table 4  
Health of the Sample

Institution	Good		Fair		Poor	
	No.	Percent	No.	Percent	No.	Percent
College Hill	14	64	8	36	0	0
Wharton Manor	9	56	6	38	1	6
Rebekah-Odd Fellows	10	77	3	23	0	0
Parkview Manor	4	50	4	50	0	0
Overall	37	63	21	36	1	2

Source: Survey data

Although the intention was to include only those individuals who were ambulatory an institution director urged that those less mobile be included even those in wheelchairs, as they could, and did, make "trips." Despite the fact that sixty-three percent said that they were in good health, "good" mobility was claimed by only thirty-seven percent of the sample (Table 5) (page 59). This judgement varied from sixty-two percent in Rebekah-Odd Fellows to twenty-five percent in Parkview Manor. Fourteen percent considered their mobility as "fair," but it again ranged widely from six percent at Wharton Manor to fifty percent at Parkview Manor. Only one person fell into the "poor" group, a category which probably should not have been utilized, as those with poor mobility generally use an aid. Fifteen percent of those interviewed used a cane, seventeen percent a walker, and fifteen percent a wheelchair.

#### KNOWLEDGE OF THE COMMUNITY

With the thought that knowledge of the Manhattan community, or lack of it, might affect spatial behavior, appropriate information was obtained from the sample. Knowledge of a community would be affected by how long an individual had resided there. For the sample, the mean number of years lived in Manhattan or the vicinity was 30, although it was only seven years for Rebekah-Odd Fellows' residents. This broke down into sixty-three percent "Manhattan" and thirty-seven percent "vicinity." The largest category was 1-4.9 years, with thirteen percent, followed by fourteen percent in the 30-39.9 year division, and fifteen percent in the 60-69.9 year group.

Table 5  
Mobility of the Sample

Institution	Good		Fair		Poor		Cane		Walker		Wheelchair	
	No.	Per- cent	No.	Per- cent	No.	Per- cent	No.	Per- cent	No.	Per- cent	No.	Per- cent
College Hill	6	27	2	9	0	0	3	14	7	31	4	18
Wharton Manor	6	38	1	6	0	0	4	25	2	13	3	19
Rebe'ah-Odd Fellows	8	62	1	8	0	0	2	15	1	8	1	8
Parkview Manor	2	25	4	50	1	13	0	0	0	0	1	13
Overall	22	37	8	14	1	2	9	15	10	17	9	15

Source: Survey data

Most important in ascertaining the individual's actual knowledge of the community was the total number of known locations of various Manhattan facilities. These locations are shown in Fig. 2, page 61. Out of eleven locations, the mean total known was only 6.9: 8.7 at College Hill, 7.7 at Wharton Manor, 6.6 at Parkview Manor, and, as its residents have resided a much shorter time in the community, only three at Rebekah-Odd Fellows (Table 6, page ).

Breaking these figures down by the residence location themselves, Rebekah-Odd Fellows' residents naturally trailed considerably in ten of the eleven divisions: holding their own only in knowing where downtown is located. As might be expected, fully ninety-two percent were familiar with the location of the CBD. Knowledge of Poyntz Avenue, or "Main Street," was expressed by seventy-three percent. The smaller commercial area of Aggieville was known by seventy-five percent of the sample, and all of Parkview Manor residents as they are located in close proximity. However, the location of Westloop Shopping Center was known by only fifty-three percent of those interviewed. Eighty percent were familiar with the Manhattan City Park. Since the park is directly across the street, all of Parkview Manor respondents were aware of it. The public library, Sunset Zoo, and Bluemont Hill were all known by fifty-eight percent. Forty-six percent claimed to know the location of the Kansas State University auditorium and fifty-one percent were sure they knew the location of the KSU football stadium.

#### THE POSSIBILITY OF VISITORS PROVIDING NEEDS AND DESIRES

The spatial behavior of a resident of an institution for the elderly could also be affected by whether or not visitors provide the subject with certain needs or desires, therefore cancelling his need for

Figure 2

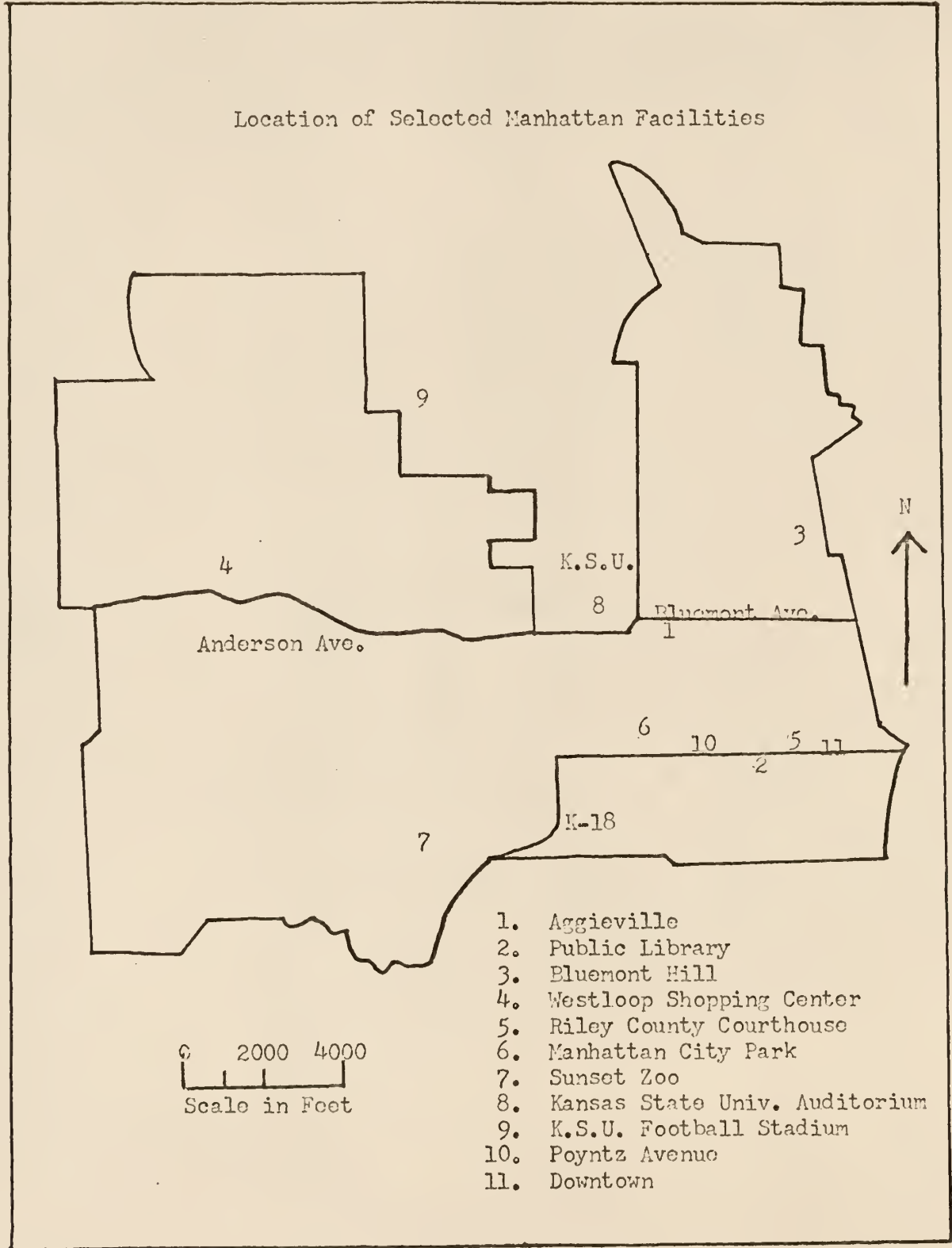


Table 6  
Known Selected Manhattan Locations

Institution	Aggieville		Public Library		Bluemont Hill		Westloop Shopping Center		Riley County Courthouse		Manhattan City Park	
	No.	Per- cent	No.	Per- cent	No.	Per- cent	No.	Per- cent	No.	Per- cent	No.	Per- cent
College Hill	18	82	17	77	16	73	14	64	19	86	19	86
Wharton Manor	14	88	10	63	11	69	9	56	13	81	14	88
Rebekah-Odd Fellows	4	31	1	8	2	15	4	31	2	15	5	38
Parkview Manor	8	100	5	63	4	50	3	38	3	38	8	100
Overall	45	76	34	58	34	58	31	53	38	64	47	80

(continued on following page)

Table 6 (Cont.)

Institution	Sunset Zoo		K. S. U. Auditorium		Poyntz Avenue		K. S. U. Stadium		Downtown		Mean No. Known
	No.	Per-cent	No.	Per-cent	No.	Per-cent	No.	Per-cent	No.	Per-cent	
College Hill	17	77	14	64	19	86	17	77	22	100	8.7
Wharton Manor	10	63	6	38	14	88	7	44	15	94	7.7
Rebekah-Odd Fellows	2	15	3	23	3	23	2	15	11	85	3.0
Parkview Manor	4	50	3	38	6	75	3	38	6	75	6.6
Overall	34	58	27	46	43	73	30	51	54	92	6.9

Source: Survey Data



some trips. Examples might be the provision of clothing, favorite snack foods, or hobby materials.

Of course the number of visitors is affected by the number of children in the community. An amazing total of sixty-nine percent had no children residing in Manhattan, and eighty-eight percent had none within fifty miles of the city's boundaries, i.e., excluding Manhattan, Parkview Manor residents had no children residing in the vicinity. Originating from farther distances, of those interviewed at Rebekah-Odd Fellows only twenty-three percent had living children in the area. Forty-two percent at College Hill and fully eighty-one percent at Wharton Manor had offspring in Manhattan or within fifty miles. These offspring in all cases fit into the "1-3 children in the vicinity" category, except for one person who had "4-5" and one individual with "6 or more."

When asked if visitors eliminate the necessity of trips by providing needs or desires, forty-two percent said "frequently." However, this is misleading as it ranged from none at Parkview Manor and eight percent at Rebekah-Odd Fellows to fifty-six percent at Wharton Manor and sixty-eight percent at College Hill. Forty-one percent of the replies fit into the "occasionally" classification, but this broke down into sixty-nine percent at Rebekah-Odd Fellows, thirty-eight percent at both Parkview Manor and Wharton Manor, and twenty-seven percent at College Hill. Seventeen percent of the sample claimed that visitors "never" eliminated the necessity of trips by providing needs or desires, but this was sixty-three percent at Parkview Manor, twenty-three percent at Rebekah-Odd Fellows, six percent at Wharton Manor, and five percent at College Hill,

The necessity to make trips is also affected by services or advantages provided by some institutions. Wharton Manor has a doctor visit regularly and conducts church services on Sundays. A barber gives some of

the men free haircuts. Rebekah-Odd Fellows also has a doctor and church services on Sunday afternoons. In the entertainment line, they can play dominoes on Wednesdays with visiting college students. Parkview Manor has Sunday morning "singing" and afternoon church services. However, it must be noted that the particular church service, or whatever, may not be the one preferred. Consequently there may still be the desire to make a trip.

#### USE OF PUBLIC TRANSIT

Bus service had been discontinued at the time of the survey, but has since been reinstated with the previously described ATA-bus. It is unfortunate that its effect could not be included in this research effort. When the bus was in operation only five percent claimed to have used it "frequently." However, this does not include Rebekah-Odd Fellows residents, who due to their location, did not have access. As it passed directly in front, thirteen percent of Parkview Manor residents used it "frequently" and twenty-five percent "occasionally." Overall, twenty percent used it "occasionally" and seventy-five percent "never." Only Parkview Manor residents concluded that bus discontinuation decreased their trip frequency, yet one person cited greater trip frequency now. Perhaps he had found someone to give him rides or taken up pedestrianism,

Only thirty-four percent of the respondents stated that they were aware of the reduced-fare taxi service for the aged. But there was much variation among the homes. Only one person knew of it at Rebekah-Odd Fellows, though from that distance the cost would be prohibitive to most residents. Nineteen percent were familiar with it at Wharton Manor, fifty percent at College Hill, and a full sixty-three percent at Parkview Manor. Not one

person claimed to use the service "frequently," Only two interviewees admitted to using it "occasionally." Despite the taxi's reduced rate, perhaps it is still not a viable means of transportation for the aged. Nevertheless, more awareness of its availability might possibly increase its usage.

#### DAILY TRIP ACTIVITY

An important measure of the effect of residence location on the spatial behavior of the elderly in institutions is their daily trip activity in light of their varied locations.

The most valid and significant measure of the effect of institution location on spatial behavior among daily trip activity characteristics is trip frequency. In order to prod the memory of the subject the questionnaire was designed to ascertain spatial behavior for each day of the week in sequence, and then for every two weeks, occasionally (specify), and yearly. The day of the week divisions were rarely used, although a significant number of respondent had "daily" spatial behavior, usually walks. It might be mentioned that many "weekly" trips fell on random days, rather than on a specific day. Due to the fact that an occasional category, always specified, was frequently utilized, nineteen time divisions resulted such as twice monthly, every three months, twice weekly, or twice yearly. Examples of yearly trips would be trips to relatives for Christmas, Trips every three months might be trips to the doctor, A monthly trip could be a ride in the countryside with the kids, Sunday trips were usually to church, and daily trips were frequently walks.

Considering only the more popular categories, fifty-four percent of all trips occurred daily, seventeen percent three times a day, thirteen

percent weekly, and seven percent Sundays. More specifically, each interviewee at College Hill averaged .99 trips per week, at Wharton Manor 1.44, Rebekah-Odd Fellows 3.53, and Parkview Manor 3.93. However in examining the effect of institution location on trip frequency, "walks" on the grounds of a residence were not relevant to location and were discounted. College Hill therefore averaged .35 trips per week per subject, Wharton Manor .44, Rebekah-Odd Fellows .15, and Parkview Manor, by far the most advantageously located in regard to "opportunities," remained at 3.93 (Table 7) (page 68). Those trip frequencies were in the order previously anticipated. It must be noted that the farther the institution from opportunities and facilities, the less trip frequency. Confirming the research hypothesis, the obvious conclusion is that institution location indeed affected the spatial behavior of the sample, trip frequency decreasing with increasing distance.

Nevertheless, seventeen percent of the respondents made no trips whatsoever. This broke down into six percent for Wharton Manor, eighteen percent for College Hill, twenty-three percent for Rebekah-Odd Fellows, and twenty-five percent for Parkview Manor. Twenty-three percent for isolated Rebekah-Odd Fellows was expected, however twenty-five percent for Parkview Manor was surprising. It appears to be due to poor "mobility" of individuals. This group had few outsiders to depend on, and no institutional assistance for daily trip activity. For example, one person had no assistance with his wheelchair, and a very enthusiastic lady claimed that she would love to get out if someone would just go with her to hold her arm.

Trip frequency has often been investigated, but with contradictory results. It is impossible at this stage of the analysis to compare my findings with others. Although they consider the effects of variables such

Table 7

Trip Frequency of Sample<sup>a</sup>

Institution	Average Weekly Trips Per Subject	No Trips No, Percent	
College Hill	.35	4	18
Wharton Manor	.44	1	6
Rebekah-Odd Fellows	.15	3	23
Parkview Manor	3.93	2	25
Overall	1.22	10	17

<sup>a</sup>excluding walks on institution grounds

Source: Survey data

as income and age, they neglect the effect of residence location upon spatial behavior.

Among this sample personal business trips, e.g., banking, bill paying, were observed to be non-existent (Tables 8 and 9) (pages      and      ). Entertainment trips, as well as those for medical purposes, accounted for only one percent. Trips for the purpose of entertainment encompassed none of both Wharton Manor and Rebekah-Odd Fellows residents total trips, but 1.1 percent of College Hill's and 2.2 percent of Parkview Manor's. Parkview Manor's lead is not surprising as its location allowed the most opportunity for entertainment trips, as previously related. Trips for medical purposes not only included regular visits to the doctor, but are perhaps exemplified by the lady who occasionally visited the dentist and optometrist, as well as the dermatologist. Of their total trips only .1 percent of Rebekah-Odd Fellows' were for medical purposes, .7 percent of Parkview Manor's, 1.3 percent of Wharton Manor's, and 2.1 percent of College Hill's.

Unexpectedly, only two percent of total trips were for the intention of "visiting," and were overwhelmingly to visit relatives. Parkview Manor residents, who had no children living within fifty miles, made no visiting trips. Rebekah-Odd Fellows subjects, with few children in the area, made only .6 percent of their trips for this purpose. College Hill, with forty-two percent having children within a fifty mile radius, had a percentage of 1.5 percent. Residents of Wharton Manor, eighty-one percent having offspring in the vicinity, embarked upon 5.4 percent of their trips for the purpose of visiting. It is obvious that institution location played a role in visiting relatives. Distance presented a definite obstacle to this trip purpose.

Surprisingly, a mere four percent of all trips were for the purpose of shopping, 1.1 percent at Rebekah-Odd Fellows, 3.2 percent at Parkview Manor, 5.7 percent at College Hill, and 7.6 percent at Wharton Manor. The distant

Table 8

Trip Purposes of Sample<sup>a</sup>

Institution	Shopping	Visiting	Entertainment	Church	Medical	Other
College Hill	5.7	1.5	1.1	5.0	2.1	84.7
Wharton Manor	7.6	5.4	0.0	13.0	1.3	72.7
Rebekah-Odd Fellows	1.1	.6	0.0	2.2	.1	96.0
Parkview Manor	3.2	0.0	2.2	5.5	.7	88.3
Overall	4.0	2.0	1.0	6.0	1.0	85.0

<sup>a</sup> percentage of total trips

Source: Survey data

Table 9

## Purposes of "Other" Trips

Institution and Trip Purposes	Percentage of Total Trips
<u>College Hill</u>	
walk	64.6
beauty parlor	9.2
ride	4.8
club	3.4
bus excursion	1.6
nonpurposeful outings	1.1
<u>Wharton Manor</u>	
walk	69.5
club	1.0
beauty parlor	1.0
ride	1.0
picnic	.2
<u>Rebekah-Odd Fellows</u>	
nonpurposeful outings	85.8
walk	1.5
zoo	.7
go to the park	.2
beauty parlor	1.5

Source; Survey data



Table 9 (Cont.)

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Institution and Trip Purposes	Percentage of Total Trips
<u>Overall</u>	
walk	58.0
nonpurposeful outings	22.0
picnic	3.0
club	1.0
ride	1.0
bus excursion	.004
go to park	.002
beauty parlor	.0005
eating out	.0003
zoo	.0003

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Source: Survey data

location of Rebekah-Odd Fellows doubtless accounted for the lack of shopping trips by the interviewees there. Church attendance was responsible for six percent of all trips. As previously recounted, three of the homes have religious services, but not necessarily those of the religion of their residents. Church accounted for only 2.2 percent of trips by Rebekah-Odd Fellows residents, probably due to their isolation and their Sunday afternoon services. Despite the offering of religious services, five percent of College Hill interviewees' trips and 5.5 percent of Parkview Manor's were for church. Religious differences and/or accessible churches may have been responsible for these figures. With no church services available, fully thirteen percent of Wharton Manor subjects' trips were for this purpose.

Having exhausted the commonly utilized categories for trip purposes, I was unprepared to discover that eighty-five percent of all trips were for "other" purposes. Because of this unexpectedly high percentage, this category was broken down to establish exactly where the elderly were going. Considering only the most common purposes, fifty-eight percent of all trips were walks overwhelmingly on institution grounds. Twenty-two percent usually occurring in Aggieville or downtown were a similar category: "goofing off." "nonpurposeful outings," or "loafing" in the respondents' words. These outings generally took the form of a walk with stops for chatting with friends, sitting down, or window-shopping, at the whim of the subject. Three percent were excursions to the beauty parlor, one percent to various clubs-- such as lodge, bridge, or V.F.W. meetings, and one percent for "rides."

Wholly 84.7 percent of College Hill residents' trip behavior fitted into the "other" category. A full 64.6 percent of the total trips were to take walks, 9.2 percent trips to the beauty parlor, 4.8 percent "rides," 3.4 percent clubs, 1.1 percent "nonpurposeful outings," and 1.6 percent bus trips. College Hill's

private bus trips deserve special mention. Approximately every month or two the home offers free trips for its residents for such purposes as sightseeing, picnics, and scenic drives. Sample past trips include a picnic at Tuttle Creek and an excursion to the Eisenhower Center in Abilene.

At Wharton Manor 72.7 percent of the total trips were in the "other" classification, 69.5 percent were walks and .2 percent picnics. One percent each were trips to clubs or beauty parlors, and "rides."

A whopping ninety-six percent of trips at Rebekah-Odd Fellows fit into the "other" class. Only .1 percent were for the purpose of "eating out" and the rest, 95.8 percent for walks. Surely this reflects a lack of opportunity for other types of spatial behavior. Here, and also to a high degree at College Hill and Wharton Manor, the residents advised me that in order to escape from their homes their only option was to take a walk.

Parkview Manor was a somewhat different story. 88.3 percent of its daily trip activity fell into the "other" category. But only 1.5 percent of it was for the purpose of taking a walk. However, subjects accomplished basically the same thing by trips to Aggieville, and even the CBD, for nonpurposeful outings, 85.8 percent of their total trips. Naturally, they would have been unable to do this if it were not for their proximity to these destinations. In addition, .7 percent of their trips were to sit in the park, .2 percent to the beauty parlor, and .1 percent to visit the zoo.

The trip purposes of these elderly in institutions contradict those of the general elderly population in other research efforts--doubtless partially due to the effects of institutionalization. Whereas most of the general aged population's trips were, first, for the purpose of shopping and, second, social visits; this sample's trips were predominantly, fifty-eight percent, for the purpose of taking a walk,<sup>5</sup> Only four percent of their total spatial behavior was directed towards shopping, and two

percent "visiting."

The summarization shows that fully ninety-nine percent of the total trips were single-purpose, one stop. According to the literature, this is much higher than for most groups, probably due to the sample's dependence on others for transportation, as well as "mobility considerations."<sup>6</sup> Examples of the few multiple-purpose trips include one aged gentleman who liked to loaf downtown and then stop in to visit old cronies in his printing shop, and "shopping and eating out" trips. Also, it should be noted, some of College Hill's bus excursions were multiple-purpose.

An important question previously mentioned regarding the spatial behavior of the elderly is whether or not they distance minimize, i.e., do they go to the nearest store at which a good or service is offered, For example, do they go to their favorite barber shop across town or do they pick the nearest one across the street? Because of enormous diversity in trip destinations, e.g., the various churches, doctors, homes of relatives, no attempt was made to summarize this data in table form. Consequently, little information is available on actual trip distances and it is difficult to ascertain whether or not the elderly distance-minimize. However, I am able to address this question by studying trips to shopping destinations for the purpose of shopping or nonpurposeful outings.

Eighty percent of the total destinations were the CBD, or downtown shopping area. Fifteen percent were in Aggieville, and five percent at a small, general store approximately one-half mile from Rebekah-Odd Fellows Home (Table 10) (page 76).

College Hill and Wharton Manor residents made all of their trips to the CBD. Therefore they did not distance-minimize, being located closer to both Westloop Shopping Center and Aggieville. Seventy-five percent of Rebekah-Odd Fellows shopping destination trips were to the CBD, and twenty

Table 10

Distance-Minimization of Trips to Shopping Destinations for the Purpose  
of Shopping or Nonpurposeful Outings<sup>a</sup>

Institution	Downtown		Aggieville		Country Store		Total				
	Shop.	N.O. <sup>b</sup> Comb. <sup>c</sup>	Shop.	N.O. Comb.	Shop.	N.O. Comb.	Shop.	N.O. Comb.			
College Hill	83	17	100	0	0	0	0	83	17	100	
Wharton Manor	100	0	100	0	0	0	0	100	0	100	
Rebekah-Odd Fellows	75	0	75	0	0	25	0	25	100	0	100
Parkview Manor	20	20	40	0	60	60	0	0	20	80	100
Overall	70	10	80	0	15	15	5	5	75	25	100

<sup>a</sup> percentages of total shopping trips and nonpurposeful outings.

<sup>b</sup> nonpurposeful outings

<sup>c</sup> combined trips

Source: Survey data

five percent to the small store within walking distance. Those who chose downtown could also have selected the closer Westloop Shopping Center. But a minority did take advantage of the nearby store, which shows that twenty-five percent did distance-minimize. Forty percent of Parkview Manor trips took place downtown, with sixty percent at nearby Aggieville--showing definite distance-minimization.

It must be emphasized that where shopping was within walking distance it was utilized, as by residents of Rebekah-Odd Fellows, and especially by Parkview Manor subjects. But overall, to a much higher degree than anticipated, the majority, though closer to shopping centers, chose downtown for shopping or nonpurposeful outings. From comments made by the respondents it is felt that this resulted from a combination of sentiment, habit, and practicality as well as the fact that these shopping centers did not exist for most of the interviewees before retirement. Further, there was a common consensus that there is better shopping downtown. A lack of available transportation to outlying shopping facilities was also a factor. These results conflict with central place theory, which stipulates that a consumer will most frequently take advantage of the nearest place at which a good is offered, but concur with Clark's consensus that people travel significantly greater distances to the CBD.<sup>7</sup> With research regarding elderly distance-minimization very conflicting, this study is in agreement with Ashford and Holloway's conclusion that the aged do not distance-minimize for shopping purposes;<sup>8</sup> but it contradicts Hanson's findings in Sweden showing that the old distance-minimize except when grocery shopping.<sup>9</sup>

It is obvious that despite location, spatial behavior can be greatly affected by available transportation--its cost, comfort, ready availability, for example. None of the sample drove their own car although, as previously mentioned, two still owned cars kept by their children (Table 11) (page 78).

Table 11.

Travel Mode of Sample<sup>a</sup>

Institution	Auto Passenger	Taxi	Pedestrian	Bus
College Hill	32.2	1.5	64.6	1.6
Wharton Manor	28.9	.5	70.5	0.0
Rebekah-Odd Fellows	3.9	0.0	96.1	0.0
Parkview Manor	4.7	.2	95.0	0.0
Overall	17.0	1.0	80.0	.4

<sup>a</sup>percentages of total trips

Source: Survey data

As bus service had been discontinued at the time of this research, it also was not utilized. Seventeen percent of all trips were as car passengers, one percent in taxis, .4 percent were College Hill's bus excursions, and an overwhelming eighty percent as pedestrians; these results greatly affected by trips for the purpose of taking a walk. Although the dependence upon relatives and friends for transportation was expected, the extent of pedestrianism was unpredicted.

College Hill's trips were .4 percent by bus (excursions), 1.5 percent by taxi, 32.2 percent as car passengers, and 64.6 percent pedestrian trips, in this instance all walks. Of all the homes it had the highest percentage of car passenger trips, perhaps because of the large number having children living nearby. College Hill residents also had the most taxi trips, possibly due to having the highest incomes among the institutions.

Wharton Manor's trips were 70.5 percent pedestrian, with 69.5 percent for the purpose of taking a walk. The taxi served as the travel mode in only .5 percent of all trips. Of the total trips 28.9 percent were as a car passenger, again probably affected by most having offspring close by. With 96.1 percent, the primary transportation mode at isolated Rebekah-Odd Fellows was pedestrianism (95.8 percent "walks"). This home had no taxi trips because of lack of knowledge of the reduced-fare elderly taxi service. However, at this distance the cost would still be prohibitive. Only 3.0 percent of total trips were as car passengers (only twenty-three percent having children within fifty miles).

Only .2 percent of Parkview Manor subjects' trips were by cab. This could have been due not only to limited incomes, but also to the fact that many destinations were within easy walking distance. In fact, ninety-five percent of the respondent's trips were made as pedestrians, though at this institution only fifty-eight percent were for the purpose of taking a walk. With no children residing in the vicinity, only 4.7 percent of the interviewees' trips were as car passengers.



According to most surveys the general elderly population experiences decreased driving capability and increased dependence upon public transit and trips as car passengers. However, this sample had little available public transit and less than average car passenger trips. Fully eighty percent of daily trips were made on foot. Although few existing studies recognized walking as a valid transportation mode, this investigation concurs with H.E.W. evidence that the elderly take more short walking trips than the rest of the population and may be more dependent on walking as a primary transportation mode.<sup>10</sup> It also is in agreement with the Senate report that revealed the majority of trips by the aged are walking trips to various destinations, or simply to take a walk in the neighborhood.<sup>11</sup>

In order to more thoroughly evaluate the transportation problems of the subjects, the reasons for and importance attached to their transportation selections were examined and one of the questions they found difficult to comprehend. Possible reasons offered for transportation choices were "least expensive," "only mode available," "immediately available when needed," "most comfortable," "least time-consuming," "short distance," "enjoy walking," "ambulatory problem," and "no longer drive." Their decisions were greatly affected by the fact that many "reasons" were not even considered applicable as the subjects often had no real alternatives, such as driving a car or taking a bus or taxi. If they wanted to go someplace they simply walked or rode as a car passenger with relatives or friends.

Despite the shortcomings of this question, several conclusions do stand out. As might be expected, the most important reason for choosing a certain transportation mode was simply that it was the "only mode available." It was especially important to Parkview Manor--disadvantaged with regard to income and family ties--where eighty-eight percent cited it as "very important." Also significant was the reason of being "least expensive," again especially

to Parkview Manor. "Enjoy walking" was important to many, especially at Rebekah-Odd Fellows, where 80.8 percent claimed it to be "very important." It could be asked if this is subconsciously due to the fact that if they want to have any daily trip activity they are forced to walk.

Considered fairly important were the reasons "no longer drive" and "short distance," especially for residents of Parkview Manor. Perhaps these both tie into the fact that Parkview Manor is located close to many "opportunities," and residents therefore select walking as the only viable transportation mode.

Despite institutional opportunities for greatly increasing resident spatial behavior by the provision of transportation, a paltry one percent of all trips utilized transportation furnished by the homes. College Hill led, with 1.6 percent of its trips by institutionally provided transportation. However, all of these were "bus excursions" reported by the residents. Of all Parkview Manor residents' trips, .5 percent were supplied by the home, in that the institution provided transportation for medical purposes when residents had no other resources.

Wharton Manor had no institution transportation, unless assistance with wheelchairs to the medical facilities across the street qualifies. The most remotely located. Rebekah-Odd Fellows Home also had no residence-provided transportation. However, the interviewees advised that some time ago they had access to a station wagon in which they could go shopping with aides one a week. When queried regarding this, the director declared that he was planning to reinstate this option in the near future. Nevertheless, it is obvious that one carload a week to town is not going to increase greatly the spatial behavior of the residents.

As previously mentioned, trip accompaniment can affect whether or not an individual decides to take a trip, perhaps needing someone to help with

his wheelchair, hold an arm, or just to supply moral support. On the whole, seventy-six percent of all trips were made alone, which surely says something about the capability for mobility of the senior citizen. Nevertheless, this does not reveal how many trips may not have been attempted for lack of accompaniment. A mere one percent of all trips were accompanied by staff members and .003 percent by those in the "other" category, such as church members or other residents. Surprisingly, twelve percent of total trips were with friends and only eleven percent with relatives. However, these figures tell a different story when the institutions are examined separately.

Fully 93.3 percent of Parkview Manor's trips were made "alone." Perhaps this was partially influenced by the fact that its location allowed the subjects to walk to several "opportunities," rather than have to depend on a ride. Residents were never accompanied by relatives, having no children in the vicinity. One half of one percent of all trips, those for medical purposes, were accompanied by staff. They were joined by friends on only 6.1 percent of their trips, probably having fewer friends than those in the other homes.

Wharton Manor residents', eighty-one percent having nearby progeny, made 32.1 percent of their trips in the company of relatives, and 10.2 percent in the company of friends. One percent of trips were accompanied by staff members, in the form of assistance across the street to medical facilities. Two thirds were trips made alone, predominantly walks.

Rebekah-Odd Fellows subjects made no trips accompanied by staff members. Only 3.5 percent of their trips were in the company of relatives (few living close by). Despite the fact that they were accompanied by friends on 15.6 percent of all trips, this was predominantly fellow residents walking with them on Rebekah-Odd Fellows' spacious grounds. Eighty percent of their trips were made alone, overwhelmingly walks.

College Hill residents went by themselves on two thirds of their trips. They were seldom joined by staff members on their daily trip activity.

They were accompanied fairly equally by relatives on 16.7 percent of total trips, and friends on 15.2 percent.

As previously revealed, seventy-six percent of the sample's trips were made alone. This ranged from 93.3 percent at Parkview Manor to 65.7 percent at Wharton Manor. Furthermore, twelve percent of all trips were made with one person, five percent with two, five percent with three, one percent with four, .0015 percent with five, and .004 percent with approximately thirty people-- a special category set up to accommodate the bus excursions of College Hill. For further illumination as to the circumstances of "accompaniment," trips with one person were commonly downtown shopping trips, beauty parlor appointments, or trips to the doctor. Trips with two others usually turned out to be "drives" or relatives taking the subject home to visit. Accompaniment by three to five individuals was most often for rides to church or club meetings.

It has often been theorized that the old, with no work trips, would undertake few trips during the morning, noon, or evening rush hours or after dark. My findings basically agree with this assertion, although thirteen percent of all trips were initiated during the morning rush hour, 6 A.M. to 8:59 A.M. There were no trips during the noon rush hour, 11:30 A.M. to 12:59 P.M., and only .003 percent were during the evening rush hour, 4:30 P.M. to 5:59 P.M. Apart from forty-eight percent in the "random" time category, when people claimed that they had no idea of what time of day they might decide to undertake a trip--usually walks-- the largest category of trips, eighteen percent, fell into the middle morning category, with fifteen percent in the middle afternoon division and only five percent after 6 P.M.

Survey results showed that typical morning trips were for shopping, going to church, or going to the doctor. Common afternoon trips were also

for shopping, going for walks or to the doctor, and going for rides or visiting. The average evening trip, limited in number, was for attending a club meeting or band concert. There was little in spatial behavior literature about the time of trip initiation other than Golant's Toronto findings. While in general our conclusions coincided, it is difficult to correlate his transportation-oriented study with this predominantly pedestrian sample.<sup>12</sup>

Travel time to a destination is a definite factor in assessing the effect of residence location on spatial behavior. Although travel mode and purpose--in the case of walks--are naturally considerations, institutions located farther from "opportunities" are expected to have longer travel times. Perhaps if the travel time to a destination is considered to be too long, the trip will not be undertaken. However, in this study it was concluded that travel time to destinations was not a good measure of the effect of location on trip frequency because such a high percentage of trips were for the purpose of taking a walk, with the transportation mode being by foot. Nevertheless, some understanding results from examining the homes individually.

Overall, the largest category of trips, thirty-four percent, had a travel time of ten minutes. Twenty-eight percent took five minutes, fourteen percent fifteen minutes, twelve percent thirty minutes, seven percent twenty minutes, and five percent encompassed the remaining sixteen categories of various time duration. The following summarizes the travel time of most of College Hill's trips, to varying destinations: 42.2 percent were ten minutes, 33.7 percent, mostly walks on the grounds, took five minutes, 15.3 percent, primarily trips to the CBD, required fifteen minutes. The random category comprised 3.9 percent of College Hill's trips, due to the unknown departure times of its bus excursions. One hour travel times--all rides--composed 2.7 percent of the trips.

A high 63 percent of Wharton Manor's trips had a travel time of five minutes, but they were overwhelmingly walks on the grounds. Twenty six percent took ten minutes, with varied destinations, though many were to the CBD. Twenty minute travel times accounted for 4.6 percent of trips, with quite varied destinations. Four percent took seven and one-half minutes, all walks on the grounds. Rebekah-Odd Fellows was dissimilar in that 46 percent of its travel times were thirty minutes, 38.2 percent were fifteen and 15.5 percent, twenty. These were mostly trips for the purpose of taking a walk, but the fifteen minute category also included trips to various Manhattan destinations.

Fully two thirds of all Parkview Manor's travel times were ten minutes, resulting from nonpurposeful outings as pedestrians. Fourteen percent were five minutes, mostly pedestrian trips to Aggieville; 6.3 percent took eight minutes, again for non purposeful outings, while 6.3 percent also took twenty minutes, all pedestrian trips with a CBD destination. Two minute travel times, with the intention of attending the summer band concerts in the park across the street, comprised 3.2 percent of Parkview Manor's trips.

Although naturally affected by travel mode and destination, trip purpose is frequently the most important factor in the duration of trips. In general, considering the largest of the 24 duration categories, it was observed that trips of ten to forty minutes duration tended to be for the purpose of taking a walk. One-hour trips were predominantly medical trips, with some "drives." One and one-fourth hour trips were most commonly band concerts or church, although there was great variation regarding the length of church trips. Visits to the beauty parlor and nonpurposeful outings most often fell into the one and one-half hour category. Two hour trips were primarily shopping excursions, along with some "rides." Very long trips tended to be visits to distant relatives.

Disregarding percentages under four it was discovered that twenty-six

percent of all trips lasted for thirty minutes. This was followed by twenty-three percent taking ten minutes, fifteen percent one hour, nine percent twenty minutes, seven percent one and one-half hours, five percent two hours, and four percent including both the forty minutes and one and one-fourth hours categories. A great deal of variation in trip length among the institutions is accounted for by the fact that the residents of College Hill and Wharton Manor tended to take shorter walks than those on the spacious grounds of Rebekah-Odd Fellows. Parkview Manor was atypical in that the majority of its trips were nonpurposeful outings in Aggieville rather than actual walks.

Although this aspect of spatial behavior is relatively unstudied, this examination agrees with Golant's observation that considerable variation exists in the time length of trips, depending upon the purpose and mode of a trip.<sup>13</sup> A closer comparison of the two samples was again impossible because of their great differences, especially as regards trip purposes and travel modes.

#### FUTURE TRAVEL BEHAVIOR

Sixty-four percent of the respondents claimed that they desire more "trips." This varied from fifty percent at Wharton Manor, sixty-four percent at College Hill, seventy-five percent at Parkview Manor, to seventy-seven percent at Rebekah-Odd Fellows, the home farthest from opportunities. None desire "less" trips, however thirty-six percent of the sample would like the same amount.

Of the approximately two-thirds desiring more trips, twenty-four percent wanted shopping trips. Preferences ranged from six percent at Wharton Manor to eighteen percent at College Hill, thirty-eight percent at Rebekah-Odd Fellows, and fifty percent at Parkview Manor. The remaining

categories were fairly typical among all four residences. Eight percent desired entertainment trips, particularly for going to the movies; and eight percent, church trips. Seven percent would like more "visiting" trips, and two percent more recreation trips. No one cared for an increase in personal business trips. Fifteen percent would primarily like more trips in the "other" classification. This encompassed activities as diverse as nonpurposeful outings, buying ice cream, gardening, dancing, eating out, lodge meetings, and so forth.

Thirty-six percent of the respondents claimed that "better health" would motivate them to increase their trip frequency. But this was stipulated by a total of fifty percent at Wharton Manor and only fifteen percent at Rebekah-Odd Fellows, the extremes in this category. "Available transportation" would motivate thirty-two percent of all respondents, although it was not representative of College Hill with fifty percent and Wharton Manor with thirteen percent.

Just "closer destinations" would solve the problem for nineteen percent, although it varied from none, surprisingly, at College Hill to thirty-eight percent at outlying Rebekah-Odd Fellows and, also unexpected, Parkview Manor. Perhaps it is because of the fact that Parkview Manor residents frequently walked to their destinations. Seven percent stated that their primary drawback was "lack of accompaniment." For example, one gentleman wanted someone to help with his wheelchair and one woman simply someone to hold her arm, in that she always walked to places as she suffered from carsickness. Five percent would be motivated if they had "more money to spend" and two percent for "other" reasons.

Specific locations were given by the subjects for their desired destinations. It is interesting to note that for their shopping trips, as well as for many others, all chose the CBD except for one person, who choose



K-Mart. Surprisingly, despite their proximity to Aggieville, sixty-three percent of trips desired by Parkview Manor residents were preferred to have downtown destinations, possibly because of better facilities. Overall, many people chose "anyplace," for trips just so long as they could leave their residence.

The preferred transportation mode was an expected eighty percent as a car passenger. However, this included only fifty percent of Parkview Manor interviewees, twenty-five percent preferring to walk and thirteen percent each the taxi and bus. Overall, seven percent preferred to be pedestrians, five percent to be car drivers, five percent to take a taxi, and three percent the bus. None chose the "other" division, but it is possible that they were unfamiliar with options such as the "jitney."

When the respondents were queried as to what would solve their transportation problems, an overwhelming eighty-three percent selected "free community service transportation," seven percent inexpensive bus service, five percent inexpensive taxi service, and five percent the "other" category. It is clear that lack of money for transportation and a desire for independence are important factors in these results. Convenience is also a probable reason, considering the inherent difficulties of taking a bus or taxi.

#### DESIRED PROXIMITY TO SELECTED DESTINATIONS

Another approach to solving the problem of access to "opportunities," as opposed to improved transportation, would be a residence location with closer proximity to facilities. In summarizing the farthest distances that the subjects would consider going to reach their destinations, due to the wide range in values it was necessary to utilize modal values, i.e., the distances most often selected. However, when the modal value turned out to

be in the "not considered" category--the majority of entries were made by those who rated a destination as "not important,"--the next highest modal value is given.

As might be expected, forty-nine percent of those interviewed considered it "very important" to be located close to relatives, while thirty-four percent said it was "important," and seventeen percent said it was "not important." Interestingly, it was rated much less important at Parkview Manor and Rebekah-Odd Fellows, their residents disadvantaged in regard to nearby family ties. The modal distance for desired proximity to relatives was one mile. It also appears the elderly deem it important to be close to friends as forty-six percent felt it was "very important," thirty-four percent thought it was "important," and twenty percent rated it as "not important." Again, a desired distance of one mile was selected.

Proximity to church also was discovered to be important to the sample. Forty-two percent claimed it was "very important," thirty-one percent said it was "important," and twenty-seven percent decided it was "not important." Five miles was given as the farthest destination the respondents would consider traveling to go to church. Fully fifty-three percent of those interviewed felt that it was "very important" to be close to shopping, although there was a moderate variation among the institutions. Fifteen percent felt it was "important," and thirty-two percent concurred that it was "not important." Five miles was again chosen as the farthest destination subjects would travel to go shopping.

Only fifteen percent said that it was "very important" to be located in close proximity to a park, although a high forty-one percent claimed that it was "important." Forty-four percent considered it to be "not important," However, Parkview Manor residents, the group located closest to a park and who most utilized one, felt that it was very important.

Perhaps they were the most aware of its possibilities, because of this proximity and usage. One mile was the greatest distance anyone would consider traveling to utilize a park. The library proved to be not as important to the interviewees, only ten percent citing it as "very important," and twenty percent "important." Sixty-nine percent called it "not important," a percentage fairly typical of all the homes. One mile was the farthest anyone would consider going to reach a library. These findings probably reflect the fact that fifty-nine percent of those interviewed had no high school diplomas. It is unfortunate, as reading could be a compensation for lack of mobility.

The importance of entertainment such as movies and concerts also did not rank so highly with the respondents. Overall, only fifteen percent stipulated that it was "very important," twenty-five percent "important," and a striking fifty-nine percent "not important." However, it must be noted that Parkview Manor ranked it significantly higher than the other residences. In fact, only twenty-five percent considered it as "not important." Located the closest to entertainment facilities, Parkview Manor residents attended the most movies and frequented the summer Manhattan City Park band concerts. Again, one mile was the distance chosen as the farthest the sample would like to travel to reach entertainment.

With little need under the circumstances, it is not surprising that close proximity to business offices was not rated that importantly. Only five percent considered it "very important," thirty-six percent "important," and fifty-nine percent "not important." However College Hill, with the highest income, ranked it as much more important than the other homes, only thirty-two percent of its residents considering it "not important." An equal number noted that they would travel up to one or five miles to reach business offices.

This is in great contrast to the one block which Parkview Manor would consider. It is in keeping with the small distances Parkview Manor residents would travel to all destinations. Perhaps this is because of the fact that the majority "walk" as their primary transportation mode. The other institutions' subjects are more used to vehicular transportation and accustomed to traveling further distances to reach their destinations. Yet College Hill and Rebekah-Odd Fellows residents generally would consider going greater distances than would the residents of Wharton Manor, located closer to most destinations. Overall, even though this sample deemed it important to be close to many destinations, the interviewees chose fairly long distances that they would consider going to reach them.

#### SUMMARY

This chapter began with an explanation of the design and implementation of the questionnaire-interview. It primarily consisted of a summarization of the survey findings, principally relating the sample's socio-economic characteristics, aging information, and daily trip activity. It further revealed the research results with regard to knowledge of community location, possibility of visitors providing subject needs and desires, effect of public transit, future daily trip activity, and desired proximity to selected destinations.

Most important was the comparison of the daily trip activity at the four variously located institutions to determine the effect of location upon spatial behavior. In support of the research hypothesis, trip frequency was found to decrease with increasing distance from facilities and opportunities. Despite the fact that most examinations of the aged which claim the leading trip purpose to be shopping, followed by social visits;

walks, were the predominant trip purpose of this sample. The only exception was Parkview Manor, where nonpurposeful outings to Aggieville were the major reason for trip activity.

The sample was discovered to be "transportation dependent," i.e., relying on friends or relatives for rides, but mostly pedestrianism. The intermediately located institutions were somewhat at an advantage with regard to car passenger trips, approximately ninety-five percent of the trips at the nearest and farthest "residences" being made on foot. While Parkview Manor was within walking distance of most destinations, Rebekah-Odd Fellows residents resorted to walks simply in order to have trip activity.

Although an overwhelming majority of those interviewed were not found to distance-minimize--preferring the CBD for shopping and non-purposeful outings--those located within walking distance of facilities did take advantage of them and distance-minimize. Sixty-four percent of the sample concluded that they would like increased daily trip activity, desiring free community service transportation.

The next chapter is concerned with further analysis of the research findings, examining the relationship between residence location and various aspects of daily trip activity, e.g., trip frequency and travel mode, while allowing for non-locational effects such as age and income in order to determine the effect of residence location on the spatial behavior of residents of institutions for the elderly.

## Footnotes for Chapter 3

1. U.S. Bureau of the Census, Census of Population: 1970, SUBJECT REPORTS, Final Report PC(2)-4E, Persons in Institutions and Other Group Quarters, (Washington, D.C.; U.S. Government Printing Office, 1973), p. 11.
2. Joni Markovitz, "The Transportation Needs of the Elderly," Transportation and Aging: Selected Issues, eds. E. J. Cantilli and J. L. Shmelzer (Washington: Government Printing Office, 1970), pp. 68-69.
3. U.S., Congress, Senate, Special Committee on Aging, Older Americans and Transportation: A Crisis in Mobility, Report, December, 1970 (Washington: Government Printing Office, 1970), pp. 20-21.
4. Jacob G. Gold and Saul M. Kaufman, "Development of Care of Elderly: Tracing the History of Institutional Facilities," The Gerontologist, 10:4 (Winter, 1970; Part 1), p. 271.
5. Hanson, op cit., p. 81, Golant, op cit., p. 194. See footnote 5.
6. James O. Wheeler, "Trip Purposes and Urban Activity Linkages," Annals of the Association of American Geographers, 62:4 (December, 1972), p. 641.
7. W. A. Clark, "Consumer Travel Patterns and the Concept of Range," Annals of the Association of American Geographers, 58:2 (June, 1968), pp. 386, 390.
8. Norman Ashford and Frank M. Holloway, "Transportation Patterns of Older People in Six Urban Centers," The Gerontologist, 12:1, Part I (Spring, 1972), p. 47.
9. Hanson, op cit., pp. 91 and 92.
10. J. L. Shmelzer and M. J. Taves, "The Older Pedestrian: A Social Gerontological View," AoA Position Paper (Washington: U.S. Dept. of Health, Education, and Welfare, Administration on Aging, 1969), p. 5.
11. Special Committee on Aging, Older Americans and Transportation: A Crisis in Mobility, p. 24. See footnote 3.
12. Golant, op cit., p. 196.
13. Ibid., p. 197.

## Chapter 4

### ANALYSIS OF THE FINDINGS

The summary of the findings from the survey in Chapter 3, concurrent with an assessment of the effect of location on the daily trip activity of the residents of the selected institutions for the elderly, supported my research hypothesis that location is a significant determinant of spatial behavior. Trip frequency decreased with increased distance from community facilities and opportunities. Advanced age, poor health, lack of transportation, and lowered income are most commonly regarded as the reasons for the decreased daily trip activity of the elderly. Whereas the importance of residence location to aged spatial behavior was shown in Chapter 3, this section is devoted to an examination of the existence of a positive statistical relationship between spatial behavior and residence location. It further looks for a relationship between spatial behavior and variables such as those associated with the aging process and certain socioeconomic characteristics. The relationship between certain of the aspects of daily trip activity is also inspected.

Virtually unstudied before this analysis is expected to reveal an unsuspected importance of residence location in the spatial behavior of residents of old-age homes. However, positive relationships between daily trip activity and other factors under consideration are also expected to be uncovered. Age, health, transportation, and income are all anticipated to be related to the spatial behavior of the aged.

### ANALYTICAL TECHNIQUES

Because of the nature of the data and the size of the sample, the primary statistical procedure employed for this analysis in order to

determine if a relationship exists between selected criteria arrayed in a contingency table, is the chi square test. Further, when a relationship is determined to exist, Pearson's contingency coefficient is utilized to ascertain the strength of this association. To facilitate understanding of the following analysis, both statistical methods are briefly outlined.

When employing chi square to assess relationships, one first ascertains the two criteria of classification, displaying them in a contingency table, one criteria in rows and the other in columns.<sup>1</sup> Null ( $H_0$ ) and alternative ( $H_1$ ) hypotheses are formulated. A null hypothesis is always tested against an alternative hypothesis:

$H_0$ : There is not a relationship between the two criteria of classification.

$H_1$ : There is a relationship between the two criteria of classification.

One then selects a significance level. If, for example, the .05 level of probability is chosen and the alternative hypothesis accepted, it means that this same result would be obtained ninety-five times out of 100 tests. The formula for chi square is:

$$\chi^2 = \frac{(O_{ij} - E_{ij})^2}{E_{ij}}, \text{ where}$$

$O_{ij}$  = observed number in the (i, j)th cell, and

$E_{ij}$  = expected number in (i, j)th cell,

Expected frequencies in each of the contingency table cells is obtained by the formula;

$$E_{ij} = \frac{R_i C_j}{n}$$

One can reject  $H_0$  if the value of  $\chi^2$  is in the critical region, when it exceeds a value for a given level of probability.



It is necessary to insert a cautionary note with regard to the analysis. Because of the small sample size and the nature of the data many contingency tables contain cells with fewer than five expected frequencies. This probably made it more difficult to obtain significance than if the cells had contained more expected frequencies. Moreover, it should be noted that according to Blalock, "...when a sample is small, it requires a much more striking relationship in order to obtain significance. Therefore, with small samples significance tests are far more important. In such cases we may be saying quite a bit when we can establish significance."<sup>2</sup>

A measure of the degree of relationship of the classifications in a contingency table is given by the formula for Pearson's contingency coefficient:

$$C = \frac{X^2}{X^2 + N} \quad 3$$

There is no relationship between the variables when C is equal to zero. The larger the value of C, the greater is the degree of association. The number of rows and columns in the table determines the maximum value of C, which is never greater than one. When chi square is significant, C is considered significant. In the analysis that follows, Pearson's coefficient is used to determine the strength of the relationship between selected criteria.

#### TRIP FREQUENCY

The most valid measure of the effect of residence location on spatial behavior is "trip frequency." Chapter 3 revealed that the resident mean-weekly trip frequency--discounting walks on grounds as they are not relevant to location--among institutions decreased with increased distance from facilities and opportunities in the environment.

The chi square test is utilized here to further test the relationship between location and trip frequency. For this and subsequent chi square analyses concerned with trip frequency, it was necessary to compute the daily trip frequency of each member of the sample, resulting in three trip frequency categories is essentially "no," low, and High trip frequency. To reduce the number of cells in the contingency table it was further necessary to regulate the institutions into three divisions of location--Parkview Manor considered "near" to community facilities and opportunities, Wharton Manor and College Hill "intermediate," and Rebekah-Odd Fellows "far."

As predicted, a C of .3440 and a chi square of 7.92 were significant at the .10 level of probability (Table 12). (page 98). Although .10 is not a conservative significance level, it is sufficient if you are willing to take one chance in ten of being wrong. Hence, the results of this analysis support the main hypothesis that residence location affects spatial behavior, confirming the principal assumption of decreasing trip frequency concurrent with increasing distance from facilities and opportunities.

The next aspect of trip frequency examined was its relationship with age and mobility, variables associated with the aging process. The chi square analysis revealed no association with age when excluding trips for the purpose of taking a walk on institution grounds. However, when including all trips (Table 13). (page 98), a C of .3894 and a  $X^2$  of 10.19 resulted, significant at the .05 level. Further examination of the contingency tables revealed that with increased age trip frequency remained constant. However, when walks were included, trip frequency decreased with age.

The relationship of mobility to trip frequency also proved interesting and unexpected. The  $X^2$  statistic showed no relationship between the two criteria when excluding walks. However, the relationship was

Table 12

Relationship of Trip Frequency and Institution Location,  
Excluding Walks

Daily Subject Trip Frequency	Institution Locations			Row Sums
	Near <sup>a</sup>	Intermediate <sup>b</sup>	Far <sup>c</sup>	
0	2	7	5	14
.003 - .10	2	24	7	33
.11 plus	4	7	1	12
Column Sums	8	38	13	59 (N)

<sup>a</sup> Parkview Manor

<sup>b</sup> College Hill and Wharton Manor

<sup>c</sup> Rebekah-Odd Fellows

A  $X^2$  of 7.92 was significant at the .10 level, demonstrating a relationship between institution location and trip frequency.

Source: Survey data

Table 13

Relationship of Trip Frequency and Age

Age of Subjects	Daily Subject Trip Freq.			Row Sums
	0	.01-.15	.16+	
65-74	2	3	8	13
75-84	5	15	6	26
85+	4	12	2	18
Column Sums	11	30	16	57 (N)

A  $X^2$  of 10.19 was significant at the .05 level, demonstrating a relationship between trip frequency and age.

Source: Survey data

highly significant (Table 14). (page 100), showing a C of .5015 and a chi square of 19.82 significant at the .005 level. Nevertheless, for this sample mobility does not appear to be a good measure of trip frequency even when including walks as those with "fair" mobility had a higher rate of trip frequency when walks are included than those in the "good" classification.

The relationship of trip frequency with the socioeconomic characteristics sex, income, and pre-retirement occupation was analyzed next. Sex proved to be independent of trip frequency. Surprisingly, income was also independent when excluding walks. However, overall trips (Table 15). (page 101) produced an association between trip frequency and income with a C of .4317 and  $X^2$  significant at the .005 level. But the relationship was in the opposite direction hypothesized. The lower income division contained the largest percentage of high trip frequencies, probably related to the fact that walks don't cost money.

Occupations before retirement showed no relationship with trip frequency when excluding walking trips, yet were significant with a C of .4364 and  $X^2$  of 13.88 at the .01 level with all trips (Table 16). (page 101). This implies a predisposition for walks according to past occupation. Blue collar workers, including women, show an overwhelming lead in the trip frequency category. However, this analysis was somewhat limited by the fact that there were only three occupational "classes," because of the need to eliminate cells in the contingency tables,

Chi square analyses of frequency of visitors providing needs and wants for institution residents, as well as the number of known community locations did not, as anticipated, show a relationship with trip frequency.

#### RESIDENCE LOCATION

A relationship was found to exist between residence location and the

Table 14  
 Relationship of Trip Frequency and Mobility

Mobility of Subjects	Daily Subject Trip Freq.			Row
	0	.01-.15	.16+	
Good	2	9	11	22
Fair	0	3	5	8
Poor	9	19	1	29
Column Sums	11	31	17	59 (N)

A  $X^2$  of 19.82 is significant at the .005 level, demonstrating a relationship between trip frequency and mobility.

Source: Survey data

Table 15

## Relationship of Trip Frequency and Income

Yearly Income on Subjts.	Daily Subject Trip Freq.			Row Sums
	0	.10-.15	.16+	
Under \$1,999	7	12	16	35
\$2,000 and above	2	15	1	18
Column Sums	9	27	17	53 (N)

A  $X^2$  of 12.14 is significant at the .005 level, demonstrating a relationship between trip frequency and income.

Source: Survey data

Table 16

## Relationship of Trip Frequency and Past Occupation

Past Occupation of Subjts.	Daily Subj. Trip Freq.			Row Sums
	0	.01-.15	.16+	
Housewife	7	18	3	28
Blue Collar Worker	2	4	10	16
Other	2	9	4	15
Column Sums	11	31	17	59 (N)

A  $X^2$  of 13.88 is significant at the .01 level, demonstrating a relationship between trip frequency and past occupation.

Source: Survey data

number of known community locations (Table 17). (page 103). Chi square and a C of .5190 were highly significant at the .005 level. The analysis revealed that residents of the "far" institution, Rebekah-Odd Fellows, knew by far the fewest locations, whereas those at the "intermediate" institutions, College Hill and Wharton Manor, knew slightly more than at the "near" institution, Parkview Manor.

Analysis of the association between residence location and travel mode (Table 18). (page 104) revealed a relationship between the two, a  $X^2$  of 10.52 and a C of .4204 significant at the .01 level. Yet perusal of the contingency table shows the relationship in an unexpected direction. While the dominant travel mode of the "intermediate" locations was vehicular, that for the "near" and "far" locations was pedestrian. This is partly based on the fact that Parkview Manor residents were near enough to destinations to walk and that isolated Rebekah-Odd Fellows residents had to resort to taking walks on the institutions grounds for their primary daily trip activity.

As Chapter 3 revealed a definite correlation between location and the taking of walks, they were excluded in the consideration of the relationship between location and trip purpose. A highly significant relationship was discovered to exist when dividing trip purposes into six categories. However, since a large number of cells contained fewer than five expected frequencies only the three largest categories (Table 19). page 104) were analyzed. This also produced a highly significant relationship with a C of .4588 and  $X^2$  of 22.39, significant at the .005 level. The contingency table demonstrates that while the trip purposes of the "near" and "intermediate" locations residents predominantly fell into the "other" category, followed by shopping and nonpurposeful outings and trailed by "visits;" the trips of the residents of the "far" institution were primarily

Table 17

Relationship of Institution Location and  
Number of Known Community Locations

No. Known Community Locations	Institution Locations			Row
	Near <sup>a</sup>	Intermediate <sup>b</sup>	Far <sup>c</sup>	
0-3	2	4	10	16
4-7	1	7	1	9
8-11	5	27	2	34
Column Sums	8	38	13	59 (N)

<sup>a</sup>Parkview Manor

<sup>b</sup>College Hill and Wharton Manor

<sup>c</sup>Rebekah-Odd Fellows

A  $\chi^2$  of 21.75 is significant at the .005 level, demonstrating a relationship between institution location and number of known community locations.

Source: Survey data



Table 18

Relationship of Institution Location and  
Mode of Travel

Mode of Travel	Institution Locations			Row Sums
	Near <sup>a</sup>	Intermediate <sup>b</sup>	Far <sup>c</sup>	
Vehicular	2	26	3	31
Pedestrian	4	7	7	18
Column Sums	6	33	10	49 (N)

<sup>a</sup>Parkview Manor

<sup>b</sup>College Hill and Wharton Manor

<sup>c</sup>Rebekah-Odd Fellows

A  $\chi^2$  of 10.52 is significant at the .01 level, demonstrating a relationship between institution location and travel mode.

Source: Survey data

Table 19

Relationship of Institution Location and  
Trip Purpose

Trip Purpose	Institution Locations			Row Sums
	Near <sup>a</sup>	Intermediate <sup>b</sup>	Far <sup>c</sup>	
Other	16	31	2	49
Shopping and Non-purposeful outings	5	11	4	20
Visiting	0	7	8	15
Column Sums	21	49	14	84 (N)

<sup>a</sup>Parkview Manor

<sup>b</sup>College Hill and Wharton Manor

<sup>c</sup>Rebekah-Odd Fellows

A  $\chi^2$  of 22.39 is significant at the .005 level, demonstrating a relationship between institution location and trip purpose.

Source: Survey data

for the purpose of visiting distant relatives, followed by shopping and nonpurposeful outings and with "other" last.

#### TRIP PURPOSE

Although no relationship was revealed between trip purpose and sex, and even more surprisingly, mobility, and association was manifested between "dominant" trip purpose and income (Table 20) (page 106). A C of .4184 and  $X^2$  of 9.55 was obtained, significant at the .025 level. While other "dominant" trip purposes were fairly equally divided among subjects with lower or higher incomes, the contingency table shows that all respondents whose "dominant" trip purpose was walking had low incomes.

A significant association was found between the "time of trip initiation" and trip purpose (Table 21) (page 106), with a  $X^2$  of 13.76 and a C of .3509 significant at the .05 level. The contingency table reveals that trips in the shopping and nonpurposeful outings, visiting, and "other" categories were primarily initiated during mid-morning and mid-afternoon, while walks were more evenly spread throughout the day.

Trip purpose and "total trip time" (Table 22) (page 107) were also observed to be dependent upon one another. Tests yielded a C of .7071 and  $X^2$  of 98.01, significant at the .005 level. The contingency table illustrates that shopping trips most often took from one to two hours, walks from ten to thirty minutes, visits over two hours, and "other" trips from a half hour to two hours.

#### TRAVEL MODE

Surprisingly, a relationship was not observed to exist between

Table 20

## Relationship of Trip Purpose and Income

Yearly Income of Subjs.	Trip Purpose				Row
	Walk	Visiting	Shopping or "Nonpurposeful Outings	Other	
Under \$1,999	13	4	5	8	30
\$2,000 and above	0	4	3	8	15
Column Sums	13	8	8	16	45 (N)

A  $X^2$  of 9.55 is significant at the .025 level, demonstrating a relationship between trip purpose and income.

Source: Survey data

Table 21

## Relationship of Trip Purpose and Time of Trip Initiation

Trip Purpose	Time of Trip Initiation			Row Sums
	Rush Hours or Evening	Midmorning or Midafternoon	Random	
Shopping or Non- purposeful outings	1	18	1	20
Walk	5	5	4	14
Visiting	6	8	1	15
Other	11	31	7	49
Column Sums	23	62	13	98 (N)

A  $X^2$  of 13.76 is significant at the .05 level, demonstrating a relationship between trip purpose and time of trip initiation.

Source: Survey data

Table 22

## Relationship of Trip Purpose and Total Trip Time

Total Time of Trip	Trip Purpose				Row Sums
	Visiting	Shopping or Non-purposeful Outings	Walk	Other	
10 min.-30 min.	0	1	9	1	11
31 min.-60 min.	0	2	4	14	20
61 min.-2 hrs.	0	11	1	23	35
2 hrs., 1 min. plus	15	6	0	7	28
Random	0	0	0	4	4
Column Sums	15	20	14	49	98 (N)

A  $X^2$  of 98.01 is significant at the .005 level, demonstrating a strong relationship between trip purpose and total trip time.

Source: Survey data

travel mode and mobility. The author further theorized that travel mode might be dependent upon the number of children living within fifty miles as they could provide auto transportation. A chi square test did not reveal an association. But a highly significant relationship was demonstrated between "dominant" travel mode and income (Table 23) (page 109), with C equaling .4832 and a  $X^2$  of 13.71 significant at .005. The few taxi trips fell into the high income category whereas trips as a car passenger were almost evenly divided between the high and low income groups. However, pedestrian trips were overwhelmingly in the low income category.

"Total trip time" also manifested a relationship with travel mode (Table 24) (page 109), highly significant at the .005 level with a  $X^2$  of 35.68 and a C of .5166. Vehicular trips most often took one hour to two hours or more while pedestrian trips fell primarily into the ten to thirty minutes division, closely followed by the thirty to sixty minute and one to two hours classifications.

#### SYNTHESIS OF TESTS

The most important observation surfacing from the analysis was that this sample of institutionalized elderly--whether comparative or not with others in homes for the aged--are not the stereotyped "decrepit, doddering oldsters" and are atypical from the general population of senior citizens in many aspects of their spatial behavior. One of the most important findings was that age and mobility are not the detriment to daily trip activity expected. In fact, with increased age trip frequency remained constant except when including trips for the more demanding purpose of "taking a walk." Moreover, mobility was observed to have no effect on either trip purpose or travel mode. Even trip frequency was independent of mobility except when including walks. Surprisingly, those aged with

Table 23

## Relationship of Travel Mode and Income

Yearly Income of Subjects	Mode of Travel			Row Sums
	Auto Passenger	Pedestrian	Taxi	
Under \$1,999	12	17	0	29
\$2,000 and above	13	1	2	16
Column Sums	25	18	2	45 (N)

A  $X^2$  of 13.71 is significant at the .005 level, demonstrating a relationship between travel mode and income.

Source: Survey data

Table 24

## Relationship of Travel Mode and Total Trip Time

Total Time of Trip	Mode of Travel		Row Sums
	Vehicular	Pedestrian	
10 min.-30 min.	0	11	11
31 min.-60 min.	11	9	20
61 min.-2 hrs.	28	7	35
2 hrs., 1 min. plus	25	3	28
Random	4	0	4
Column Sums	68	30	98 (N)

A  $X^2$  of 35.68 is significant at the .005 level, demonstrating a relationship between travel mode and total trip time.

Source: Survey data

"fair" mobility and an even higher trip frequency than those rated "good."

While sex was independent of trip purpose or trip frequency, income did play a role in the elderly's spatial behavior, although not as anticipated. The analysis revealed a direct link between pedestrianism and income level. The importance of "walking" to this sample is illuminated by the fact that those who made the majority of their trips on foot were overwhelmingly in the low income category, all those whose dominant trip purpose was "walking" having low income. However, income was not related to trip frequency unless walks were included, resulting in a situation where individuals with lower income experienced higher trip frequencies.

Unexpectedly, "knowledge of community locations" or "the frequency of visitors providing needs and wants" for institution residents had no effect on trip frequency, nor did "the number of respondents' children living within fifty miles" affect "car passenger" trips.

Consequently, it is concluded that one of the most important factors in the spatial behavior of institutionalized elderly is indeed "location." Residence location was directly related to the number of known community location, travel mode, and trip purpose. Those aged located close to facilities and opportunities took advantage of them by walking to these destinations. Others, situated at an intermediate distance, were forced to depend upon vehicular transportation, resulting in a lower trip frequency. Distinctly disadvantaged with regard to transportation, those aged located on the community outskirts were mostly unable to take advantage of Manhattan's opportunities and found it necessary to take walks on the institution grounds in order to have any appreciable "daily trip activity."

Apart from the demonstrated effect of location producing "walking" trips, the number of observations in various trip purpose categories also differed according to institution location. For subjects located closer to

opportunities most of these observations fell into the "other" category-- for trips of many purposes--followed by shopping and nonpurposeful outings. Isolated Rebekah-Odd Fellows residents were less able to take advantage of such opportunities, and visiting relatives therefore was their leading trip activity.

Most important of all, the analysis supported the primary research hypothesis by revealing a relationship between trip frequency and location. It evidenced decreasing trip frequency concurrent with increasing distance from destinations, significant at the .10 level of probability.

Due to the small town institutional sample, the results of this chapter were hard to compare with other research on elderly spatial behavior, frequently transportation-oriented studies. Further, many aspects of daily trip activity considered in this analysis have not been examined by other investigators.

However, several important comparisons can be made. While most researchers claim that trip frequency decreases with increasing age, it was true for this sample only when including walks.<sup>4</sup> The importance of walking to the aged has been observed in a few studies, but not its high degree of relationship with income demonstrated in this examination.<sup>5</sup> For example, most research concludes that trip frequency parallels income level, decreasing with decreasing income yet for this sample income was not related to trip frequency unless walks were included, when those were lower incomes had higher trip frequencies.<sup>6</sup>

Although location assumed an important role in the sample's daily trip activity, this aspect of spatial behavior has been relatively neglected by most in their study of elderly spatial behavior. An important exception is Golant who, in his analysis of spatial behavior, found considerable zonal variation which was only partially accounted for by socioeconomic variation.



While his attempt to explain this variation by relating it to a set of location variables was largely unsuccessful, this chapter's analysis revealed that residence location has a definite effect on the spatial behavior of institutionalized elderly.<sup>7</sup>

In conclusion, it is hoped that the results of this analysis lend insight to those responsible for the location of institutions for the elderly. Although people such as old-age home administrators have suspected the importance of easy accessibility to facilities and opportunities, institutions for the aged are most often located only with regard to considerations such as land cost and the traditional view that a lovely, tranquil out-of-the-action site is desired in old age. However, the analysis revealed the previously unsuspected great importance of residence location in elderly spatial behavior as well as shattering the common claim of the overriding importance of age, mobility, and income in influencing the daily trip activity of the aged. The investigation therefore lends credence to the future location of institutions for the elderly with convenient access to community facilities and opportunities.

## Footnotes for Chapter 4

1. Hubert M. Blalock, Jr., Social Statistics (2nd ed.; New York: McGraw-Hill Book Co., 1972), pp. 275-287.
2. Ibid., p. 293.
3. Ibid., pp. 297-298.
4. Stephen Myles Golant, "The Residential Location and Spatial Behavior of the Elderly: A Canadian Example" (unpublished Doctor's dissertation, University of Washington, 1972), p. 194; Perry O. Hanson, III, "Travel Patterns of Elderly Households in Uppsala, Sweden" (unpublished Doctor's dissertation, Northwestern University, 1972), p. 79; F. M. Carp, "The Mobility of Retired People," Transportation and Aging: Selected Issues, eds. E. J. Cantilli and J. L. Shmelzer (Washington: Government Printing Office, 1970), p. 23.
5. U.S., Congress, Senate, Special Committee on Aging, Older Americans and Transportation: A Crisis in Mobility, Report, December, 1970, (Washington: Government Printing Office, 1970), p. 24; Frances Carp, "Walking as a Means of Transportation for Retired People," The Gerontologist, II, Part I (Summer, 1971), 106; U.S., Dept. of Health, Education, and Welfare, Administration on Aging, "The Older Pedestrian: A Social Gerontological View," by J. L. Shmelzer and M. J. Taves, AoA Position Paper, Mineo (Washington: 1969), p. 5.
6. F. H. Wynn and H. S. Levinson, "Some Considerations in Appraising Bus Transit Potential," Highway Research Record, No. 197 (1967), 6-7; Joni 25 (April, 1971), 239; Golant, p. 194.
7. Golant, op cit., p. 197.

## Chapter 5

### SUMMARY AND CONCLUSIONS

We don't have really much to do with the elderly, we cast them aside. I think a civilization perhaps will be judged, not by how many roads it can build, but by how it treats itself, and we are going to be judged pretty harshly.

---Rep. David Pryor<sup>1</sup>

### SUMMARY

The central thesis of this research effort was that the location of institutions for the elderly in reference to the total community with its inherent opportunities is a significant determinant of the spatial behavior, or daily trip activity, of institution residents. The principal assumption was that decreasing trip frequency occurs with increasing distance from facilities and opportunities.

The research methodology employed a questionnaire-interview format to acquire data allowing an examination of the effect of location on the spatial behavior of twenty-five percent of the elderly at four homes for the aged located at varying distances from facilities and opportunities in the Manhattan community. The primary components of the questionnaire were sections to ascertain the respondents' socioeconomic characteristics, aging information, and to permit a longitudinal approach to determine the spatial behavior of the interviewees. It was further designed to elicit information regarding the subjects' knowledge of the community, visitor provision for needs and desires, the effect of local public transit, and desired future daily trip activity.

Part of the data evaluation consisted of a summary of survey results, the most important segment being the examination of the daily trip activity at the variously situated residences to determine the effect of location on

spatial behavior. A comparison of trip frequency among the "homes supported the primary assumption of the research. Excluding walks on grounds as not relevant to "location," trip frequency was directly proportional to distance from community opportunities, decreasing with increasing distance. The mean weekly trip frequency of Parkview Manor residents--by far the most advantageously located--was 3.93 trips, followed by intermediately located Wharton Manor with .44 and College Hill Nursing Center with .35, and the more isolated Rebekah-Odd Fellows with only .15.

The respondents, as expected, were decidedly "transportation dependent," relying upon friends or relatives for rides as car passengers. The overwhelming importance of pedestrianism was observed, particularly for residents of Parkview Manor who were within walking distance of Aggieville, and for distant Rebekah-Odd Fellow residents, to whom walks on institutional grounds were almost the only available daily trip activity.

Moreover, walks were manifested as the primary trip purpose of the institutions overall, except at Parkview Manor where nonpurposeful outings predominated. Trips for other purposes did not evidence the importance anticipated, apparently because of lack of opportunity, not desire on the part of the interviewees.

The friction of distance for combined shopping trips and nonpurposeful outings was demonstrated only by Parkview Manor residents with regard to an Aggieville destination, easily accessible by foot. Distance-minimization was not observed by the remaining institutions, whose residents preferred the central business district over closer destinations,

The second portion of the analysis consisted principally of an assessment of relationships between daily trip activity and residence location as well as selected non-locational effects. The statistical procedure employed to determine if a relationship existed between selected criteria displayed

in contingency tables was the chi square test in conjunction with Pearson's contingency coefficient to ascertain the strength of relationships.

Sex was discovered to be independent of trip purpose or trip frequency. With increased age trip frequency decreased only when walks were included. Further, mobility affected neither trip purpose, travel mode, or trip frequency except when including walks when those with "fair" mobility were found to have a higher frequency of trips than those with "good" mobility.

Although income was not related to trip frequency unless walks were included, it produced a situation where those with lower incomes had the highest trip frequencies. In addition, all subjects whose dominant trip purpose was "walking" had low incomes, with those who made the majority of their trips on foot overwhelmingly in the low income category.

After assessing the association between various other criteria it was concluded that one of the most important factors in the spatial behavior of institutionalized aged is residence location, evidenced to be directly related to the number of known community locations, travel mode, and trip purpose. Most important of all, with a significant chi square of 7.92--although at the .10 level of probability--the analysis supported the established hypothesis that location affects spatial behavior by revealing decreasing trip frequency concurrent with increasing distance from facilities and opportunities,

#### POLICY IMPLICATIONS

The research revealed that the sampled aged living in institutions were atypical of the general elderly population and not as disadvantaged as expected with regard to age and mobility considerations. They definitely

were not the stereotyped oldsters with no desire to leave their room or bed. One of the primary problems with reference to their daily trip activity was dependence upon others for transportation, and consequently they frequently resorted to walking. Income also limited their options for transportation and spatial behavior in regard to destinations.

A major problem was institution location. It affected the elderly's daily trip activity in many ways, including travel mode and trip purpose but particularly with regard to trip frequency. The only "home" located advantageously demonstrated a much higher trip frequency than those without access to facilities and opportunities within walking distance. The mean .15 trips a week manifested at the farthest location is indicative of an appalling limited daily trip activity.

It should be remembered that sixty-four percent of those interviewed felt unhappy with their present spatial behavior and desired more daily trip activity--fully seventy-seven percent at Rebekah-Odd Fellows, the home most disadvantaged with regard to access to opportunities.

As the quotation at the beginning of this chapter implies, the aged are a sensitive barometer of how well a society handles the basic problems of living. As this research has illustrated, many institutionalized elderly are still able to participate in and enjoy daily trip activity. But in order for this time of life to be a period of opportunity and dignity rather than a time of emptiness, many barriers still have to be removed and open or hidden discriminations overcome. One of the most limiting factors for the institutionalized elderly with regard to daily trip activity possibilities is that the general population does not expect them to desire spatial activity, thus few options are considered or made available. At a workshop on transportation and aging it was stated that the goal should be "to permit the elderly to feel that they are leading normal, fruitful lives in a well-balanced community, and not just existing

in God's Waiting Room."<sup>2</sup>

Although this study confirmed that it is imperative that locators of institutions for the elderly select them with respect to "access to opportunities"--close to shopping, religious, medical, entertainment facilities, and so forth--this does not solve the problem for those in Manhattan as well as other places already located at a disadvantage, or for the elderly population at large. There are two approaches which could be considered to solve the aged's "access to opportunities" problem: bring them to needed and desired facilities or "opportunities" in the environment, or else take the "opportunities" to our senior citizens.

Of course mobility or "transportation" is the key to bringing the old out into the community to "opportunities." One means purported to accomplish this is an improved bus transportation system, one designed to overcome such drawbacks as being inconvenient, uncomfortable, and time-consuming. Further, incomes typical of the elderly would also indicate the need for reduced fare programs such as those effected in some cities.

A highly touted alternative to bus transportation is a recent innovation alternately referred to as the jitney or dial-a-bus scheme.<sup>3</sup> This small vehicle designed for the handicapped to provide door-to-door transportation service when called would appear to be ideal for meeting the mobility difficulties concurrent with old age.

Even so, the aged are less able than the rest of society to deal with the inherent difficulties of travel. Their economic problems concomitant with reduced physical capabilities precludes the intensive use of transportation facilities. Thus, the answer to improving the aged's "access to opportunities" lies only marginally in the transportation sector. One means of bringing opportunities closer to them consists of

elderly "clusters" in close proximity to urban resources. This solution entirely eliminates the need to increase mobility, but it raises other problems. Exactly how close would these facilities have to be to be "easily accessible" by pedestrians? What proportion of desired trips could be expected to be satisfied in this type of community? Could all needs be met by a small set of shops in the immediate vicinity? What of the elimination of choice? What of the urge to venture out, say, to visit relatives or friends? Further, do the aged even desire "geriatric" communities or would they be happier in aged-mixed situations?<sup>4</sup>

Markovitz suggests another approach--relatively high-density residential housing developments in which persons of all age groups would reside. She claims that:

hospitals, stores, theaters, etc., exist to some degree in every community. Although the community should have a heterogenous age mix, the housing should be located within easy walking distance of these services. In this way, the costs of providing these services would be less than if the only population served were the aged; opportunities would be more accessible to the elderly, and the aged would be able to engage in social interchange with others outside of their age group, if they so desired.<sup>5</sup>

From this perspective urban planning and development activities favorable to pedestrians and pedestrianism hold promise of bringing many social, psychological, and economic benefits to the aged.

In order to best solve the "access to opportunities" problem it is important to evaluate dissimilar groups of aged separately as different solutions may be required in different cases, such as that of the elderly in institutions considered in this thesis effort. With regard to the institutionalized elderly in Manhattan, possible transportation options include the previously described elderly taxi service and ATA-bus as well as limited city bus service. The latter two were not available at the time of the survey. The city bus, though inexpensive, has the usual difficulties of being inconvenient, uncomfortable, and time-



consuming as well as offering infrequent service. The inconvenience and seventy-five cent fare of the elderly taxi service, as shown by the research results, prohibits all but extremely limited usage.

The newly initiated ATA-bus is a step in the right direction but still has many drawbacks. While it provides free door-to-door transportation, it was not designed for those with mobility problems. Further, heavy demand precludes its utilization at precise times or outside Manhattan. Although the program was designed to serve all those in Riley County it is unable to do so, thereby eliminating those most in need of it, including the residents of Rebekah-Odd Fellows. Moreover, the program is purported to be understaffed and already is in financial difficulties. Hence it may soon be one of the many efforts of this nature terminated after only a short period of operation.

When queried as to their preferred solution to the transportation problem fully eighty-three percent of the sample requested free community service transportation rather than inexpensive bus service, inexpensive taxi service, or an undefined "other" category. It is clear that money for transportation is an important factor in these results, and possibly convenience, considering the inherent difficulties of taking a bus or taxi.

Therefore, in order to improve the daily trip activity of those in old-age homes in the Manhattan community, the author suggests that volunteer car pools--perhaps twice weekly for shopping purposes, on Sundays for church, and at varied times for other destinations such as entertainment or recreation--be considered for feasibility. Another possibility, one offered in the literature, is that school buses utilized to bus children to and from school be used to pick up the elderly at specified times and transport them about in the interim hours.<sup>6</sup> College Hill

Nursing Home already possesses an old school bus which could be used most advantageously to improve the daily trip activity of its residents.

Another alternative of this nature is illustrated in

Arthur S. Flemming's statement:

I think that in many instances the transportation resources are present in a community. The problem is to coordinate those resources in such a way as to direct them to the needs of the elderly. There are many people in the community that are motivated in such a way that they would be very happy to help eliminate the isolation of the elderly, but they really don't know how to go about it. They may know of some particular situations that they can do something about, but if, within the community, someone, in either the public or private sector, would take the initiative and try to work out the logistics problems involved in relating the transportation resources of the community to the needs of the elderly, I think that we could go a lot further than we have gone in dealing with this issue within existing resources.<sup>7</sup>

This research effort further support the conclusion that, depending upon the financial and physical condition of the individual as well as his preference for independent or congregate living, old-age homes, with their daily reminders of the onset of frailty and death, are not the answer to all aged. According:

Our specially supportive environments for the aged may be health producing for only a small segment of that population and the remainder may derive greater health from a far more active and challenging existence... One may conjecture that conditioning in early life in those cultures which are characterized by high stress-seeking might demand activity of a more strenuous sort farther into old age, and it is wrong to place many of the aged from such a culture in soft wraps.<sup>8</sup>

Alternatives which would provide the services of relatives and institutions, but offered to older persons within their own homes might suit the preferences of those individuals who prefer continued independence in their living arrangements. Traveling services such as meals-on-wheels, visiting nurses, and home-makers are suggested by Lawton.<sup>9</sup>

It is wished that the results of this analysis might provide some insight to social scientists such as gerontologists, sociologists, and psychologists as well as those planning public policy for the aged. As

the first effort in geography dealing with the effect of location on the spatial behavior of the elderly in institutions, it hopefully is of utility to a growing body of geographical theory concerned in general with spatial behavior and in particular with the spatial behavior of the elderly. It is specifically desired that the results of this survey can be utilized by urban planners, architects, and others to avoid the high social cost of poorly located residences for the elderly. Perhaps

insights gained herein can be utilized by old-age home administrators, local citizens, and various community and government groups to solve the problem of accessibility to needed and desired urban functions by those in already sited institutions for the elderly.

#### IMPLICATIONS FOR FURTHER RESEARCH

Underlying this research investigation is the belief that improved theoretical insights and more effective guidelines for policymaking result from such efforts. It is also hoped that it is a point of departure from which further research will be initiated with regard to the spatial behavior of the elderly and the effect of location upon it. In addition, as it is not known if this is a "representative" sample of institutionalized elderly or to what degree the findings can be applied to similar situations, more research of this nature is necessary.

Examination of the spatial behavior of the elderly by geographers has been limited. The emphasis needs to be redirected from transportation-oriented studies to include other factors, especially the effects of age, mobility, and income on spatial behavior. Most important of all, in the tradition of geography, the investigation of the effect of location upon spatial behavior needs expanding. Relatively unstudied, more research is essential with regard to the effect of the friction of distance on

spatial behavior. In other words, do the elderly distance-minimize? Not only institutionalized elderly, but those living in their own homes need further study. Knowledge of the spatial behavior of those aged in small or medium-sized towns is particularly lacking and cogent,

In general, examinations of the effect on spatial behavior of transportation options such as improved public transit and the jitney are also necessary. Before age-mix or elderly complexes can be successfully implemented, much more information is required with regard to the accessibility needs and preferences of the elderly.

## Footnotes for Chapter 5

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4. Ibid., pp. 19-20.
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7. The National Retired Teachers Association and the American Association of Retired Persons, op cit., p. 12.
8. Daniel H. Carson and Leon A. Pastalan (eds.), Spatial Behavior of Older People (Ann Arbor, Michigan: The University of Michigan, 1970), pp. 201-202.
9. Ibid., p. 53.

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APPENDIX  
THE QUESTIONNAIRE SURVEY

## QUESTIONNAIRE

Name of institution \_\_\_\_\_ Date \_\_\_\_\_

## SOCIOECONOMIC INFORMATION

1. Sex     M   F
2. Race\_\_white\_\_negro\_\_other
3. Predominant ethnic ancestry\_\_\_\_\_
4. Religion\_\_\_\_\_
5. Birthplace\_\_\_\_\_
6. Marital status\_\_widow\_\_widower\_\_married\_\_single\_\_divorced
7. Number of living children\_\_\_\_\_
8. Education\_\_number years\_\_\_\_\_highest degree
9. Occupation before retirement\_\_\_\_\_
10. Approximate annual income before age 65
 

under \$2,000	1	\$6,000 - \$7,999	4	\$12,000 - \$15,999	7
\$2,000 - \$3,999	2	\$8,000 - \$9,999	5	\$16,000 - \$20,000	8
\$4,000 - \$5,999	3	\$10,000-\$11,999	6	over \$20,000	9
11. Present approximate annual income
 

Under \$2,000	1	\$6,000 - \$7,999	4	\$12,000 - \$15,999	7
\$2,000 - \$3,999	2	\$8,000 - \$9,999	5	\$16,000 - \$20,000	8
\$4,000 - \$5,999	3	\$10,000 - \$11,999	6	over \$20,000	9
12. Driver's license     yes   no
13. Own car           yes   no
14. Own car kept on premises     yes   no
15. If no, where kept \_\_\_\_\_

## AGING INFORMATION

16. Age\_\_\_\_\_
17. State of health\_\_good\_\_fair\_\_poor
18. Mobility\_\_good\_\_fiar\_\_poor\_\_cane\_\_walker\_\_wheelchair

## KNOWLEDGE OF COMMUNITY

19. Previous residence \_\_\_\_\_
20. Length of residence \_\_\_ years \_\_\_ months
21. Length of residency in Manhattan, Kansas or vicinity (circle One) \_\_\_ yrs.
22. Do you know the location in Manhattan, Kansas of \_\_\_ Aggieville \_\_\_ the public library \_\_\_ Bluemont Hill \_\_\_ Westloop Shopping Center \_\_\_ the courthouse \_\_\_ Manhattan City Park \_\_\_ the zoo \_\_\_ Kansas State University auditorium \_\_\_ Kansas State University football stadium \_\_\_ downtown \_\_\_ Poyntz Avenue?

## THE POSSIBILITY OF VISITORS PROVIDING NEEDS AND DESIRES, HENCE ELIMINATING THE NEED FOR TRIPS

23. Number of children residing in Manhattan, Kansas \_\_\_
24. Number of children residing within fifty miles of Manhattan, Kansas \_\_\_
25. Do visitors provide you with any of your needs and wants, eliminating the necessity for you to make certain trips \_\_\_ frequently \_\_\_ occasionally \_\_\_ never?

## INSTITUTION RESIDENCY

26. Length of residency in institution \_\_\_ years \_\_\_ months
27. How important was each of the following reasons when you selected this place of residence?

	Very important	Important	Not important
Neighborhood	1	2	3
Low rent	1	2	3
Decision of relatives	1	2	3
Had friends here	1	2	3
Near to church	1	2	3
Near to shopping area	1	2	3
Near to friends	1	2	3
Near to family	1	2	3
Near to park	1	2	3
Near to entertainment (movies, sporting events, etc.)	1	2	3
Near to public library	1	2	3
Near to university facilities (entertainment, sports, library, etc.)	1	2	3
Other _____			

## PAST SPATIAL BEHAVIOR

28. Do you make    more    less the same number of daily trips today, as before age 65?
29. Before age 65, did you travel    shorter    farther    the same distance to destinations as now?
30. Before age 65, did you    drive your own car more-less    walk places more-less    go as a car passenger more-less    take a taxi more-less    take a bus?

## USE OF PUBLIC TRANSIT

31. Did you utilize the city bus service    frequently    occasionally    never?
32. Since the city bus service was discontinued, do you make    more    less    the same number of daily trips?
33. Are you aware of the elderly taxi service?      yes      no
34. Do you utilize the elderly taxi service    frequently    occasionally    never?

## FUTURE SPATIAL BEHAVIOR

35. How important is proximity to the following places? State in blocks or miles the farthest distance you normally would consider going to reach these places.

	Very Important	Important	Not Important	Distance
relatives	1	2	3	
friends	1	2	3	
church	1	2	3	
shopping area	1	2	3	
park	1	2	3	
library	1	2	3	
entertainment	1	2	3	
business offices	1	2	3	

36. Which mode of transportation would you use if all were at your disposal?
- 1 auto (driver)
- 2 auto (passenger)
- 3 walk
- 4 taxi
- 5 bus
- 6 other \_\_\_\_\_
37. Do you presently desire    more    less    the same number of daily trips?

38. If more, for what purpose (include address)
- 1 shopping
  - 2 entertainment
  - 3 church
  - 4 visiting
  - 5 recreation
  - 6 business
  - 7 other \_\_\_\_\_
39. Would you make more daily trips if \_\_\_ you had transportation \_\_\_ you had more money to spend at your destination \_\_\_ destinations were closer \_\_\_ you were in better health \_\_\_ you had someone to go with you \_\_\_ other \_\_\_\_\_ ?
40. What would best solve your transportation problems?
- 1 cheap bus service
  - 2 free community service transportation
  - 3 cheap taxi service
  - 4 other \_\_\_\_\_

## RESPONDENT RATING

41. My evaluation of this respondent's understanding of and response to the question is \_\_\_ good \_\_\_ fair \_\_\_ poor.



DAILY TRIP ACTIVITY

TRIP PURPOSE  
(include all stops)  
 1 shopping  
 2 business  
 3 visiting  
 4 entertainment  
 5 church  
 6 medical  
 7 other \_\_\_\_\_

DESTINATION  
(address)

USUAL DEPARTURE  
TIME

USUAL RETURN  
TIME

TRAVEL MODE  
(include YES if provided by home)  
 1 car driver  
 2 car pass.  
 3 taxi  
 4 walk  
 5 bus  
 6 other \_\_\_\_\_

SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

EVERY TWO WEEKS

YEARLY

OCCASIONALLY  
(specify)

- IMPORTANCE OF TRANSPORTATION SELECTION
- 1 only mode available
  - 2 immediately available when needed
  - 3 cheaper cost
  - 4 more comfortable
  - 5 long distance, so time saved
  - 6 short distance
  - 7 enjoy walking
  - 8 nec. due to mobility problem
  - 9 no longer drive

TRAVEL TIME  
EA, DIRECTION

- ACCOMPANIMENT  
(include no.)
- 1 relative
  - 2 friend
  - 3 staff member
  - 4 alone
  - 5 other

- VISITORS  
(include no.)
- 1 relative
  - 2 friend
  - 3 other

SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

EVERY TWO WEEKS

YEARLY

OCCASIONALLY  
(specify)

THE EFFECT OF LOCATION ON THE SPATIAL BEHAVIOR OF THE  
RESIDENTS OF INSTITUTIONS FOR THE ELDERLY;  
A COMMUNITY ANALYSIS

by

CHARLOTTE JEAN BREEDLOVE

B. A., Kansas State College of Pittsburgh, 1972

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AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the  
requirements for the degree

MASTER OF ARTS

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Our country's evolution from an agrarian to an urban, industrial society, concomitant with the decline of the multi-generation extended family and resulting trend towards smaller nuclear and neolocal family units, has had profound consequences for our elderly citizens. The spatial dispersion of residence and needed or desired facilities and opportunities brought about by the automobile creates unusual difficulties for the aged, given their lessened physical capabilities and economic resources.

This effort examines the effect of location on the spatial behavior, or daily trip activity, of the elderly in institutions. The central hypothesis was that location is a significant determinate of spatial behavior; the primary assumption that trip frequency decreases with increases in distance. The study controlled for the effects of socio-economic characteristics, aging considerations, and other non-locational criteria.

The methodological approach consisted of an examination of the daily trip activity of individuals located in old-age homes in Manhattan, Kansas employing a questionnaire-interview format. The first part of the data evaluation was composed of an inspection of the daily trip activity at the variously located "residences." It supported the main research thesis, trip frequency was seen to be directly proportional to distance from "opportunities" in the environment, decreasing with increasing distance. Anticipated distance-minimization was not demonstrated, respondents most often selecting the more distant central business district for shopping and "goofing off" purposes, unless other facilities were within walking distance. The importance of pedestrianism and "walks" for the sample was especially pronounced. Walks were most important to those at long distances from desired destinations,

and pedestrianism as a transportation mode to those within walking distance of facilities and opportunities.

Analytical assessment of the findings revealed that the sample was not as disadvantaged as expected with regard to age and mobility considerations. With increased age, trip frequency decreased only when walks were included. Income greatly affected trip purpose and travel mode as well as trip frequency. The number of known community locations, travel mode, and trip purpose were all evidenced to be directly related to "residence" location. A statistically significant relationship was also observed between location and trip frequency, the most important determinate of the effect of location on spatial behavior.

The aged's unhappiness with their lack of access to opportunities was reflected by the fact that sixty-four percent of the interviewees requested more "daily trip activity." Therefore, it is hoped that the study provides some insight on the problem for gerontologists, sociologists, and those planning public policy for the aged. It is especially desired that the results of this survey can be utilized to avoid the high social cost of poor residence location in the future when planning the location of institutions for the elderly. As the first effort in geography dealing with the effect of location on institutions for the elderly, it hopefully is of utility to a growing body of geographical theory concerned in general with spatial behavior and in particular with the spatial behavior of the elderly.





