

SUBURBAN ELDERLY TRANSPORTATION
Case Study of Richmond, B.C.

By

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ABSTRACT

This thesis was undertaken to examine the travel characteristics and transportation difficulties of independent-living elderly residing in suburban areas. The underlying intent of the research was to test the following hypothesis: although many independent-living elderly may own cars, they would prefer to use public transit, particularly demand-responsive public transit, provided it satisfied their travel requirements and public transport expectations. An examination of existing literature on the travel habits, mobility constraints, and public transportation expectations of the elderly revealed the following:

1. The number of older people in Canada is increasing dramatically, particularly in suburban areas.
2. Adequate transportation is essential to the physical, social, and psychological well-being of the elderly.
3. Elderly individuals residing in the suburbs are faced with certain inevitable transportation difficulties as a result of their residential location.
4. Demand-responsive transportation systems appear to most effectively increase the mobility of those seniors inadequately served by public transit and with little or no access to a private vehicle.
5. The co-existence of a demand-responsive transport system and a public transit system within a suburban area would satisfy both the transportation needs of the elderly and those of their younger counterparts.

The primary research task involved an exploratory survey of eighty-five Richmond independent-living elderly residents. Their travel habits, auto availability, reliance upon existing modes of public transportation, and difficulties encountered with the existing public transit system were ascertained through a self-administered questionnaire.

Survey findings revealed most of the elderly to be fairly active and social. The majority carried out their daily errands sometime between 9 am and 4 pm, mainly within Richmond. Many relied upon their own vehicle for transportation and reported experiencing either no difficulty or only occasional difficulty in getting about. Car ownership rates were lower for the late-elderly respondents than the early-elderly, and the former age group also reported greater mobility difficulties. Overall, the sample was comprised of fairly agile and mobile seniors, most of whom were still quite capable of using the same public transportation systems as the rest of the suburban population.

Planners responsible for the provision of transportation for suburban elderly residents should be aware of the following major conclusions drawn from this thesis:

1. Most of the elderly car-owners surveyed preferred their own car over the use of public transit, regardless of whether or not existing public transportation systems were to be modified to better satisfy their needs.
2. The dramatic growth rate of individuals 75 years and over will inevitably lead to an overall increase in demand for public transportation, with a particularly large increase in demand for the existing HandyDART custom transit service.
3. Dependence upon public transportation by increasing numbers of suburban elderly females is expected to become much greater in the future.
4. The provision of an exclusive demand-responsive transit service for the elderly in Richmond is evidently not necessary.
5. Although the existence of public transportation along major routes within Richmond heading to downtown Vancouver appears to be plentiful, transit service on some of the routes running east to west throughout the municipality is apparently inadequate.

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GLOSSARY OF TERMS

Accessible: In a physical sense, accessible means to be able to be entered, egressed, and used safely by all persons.

Ambulatory: pertaining to walking; mobile

Data: the information gathered in the study. In this thesis, it consists of information acquired from a review of existing literature and a survey of eighty-five independent-living elderly Richmond residents.

Demand-Responsive Transit: A type of transit service characterized by flexible routing and/or scheduling of vehicles in response to demand.

Disability: Any restriction or lack of ability to perform an activity in the manner or within the range considered normal.

Early-Elderly: individuals aged 60 to 75 years

Eligibility Criteria: A standard which individuals have to meet before being allowed to use specialized transit services.

Fare: The authorized amount (whether cash, ticket, token, pass, or valid transfer) paid for a ride on a transit vehicle.

Functional Limitations: constraints placed on individuals as a result of disability

Handicap: A disadvantage for a given individual, resulting from an impairment or disability that limits or prevents the fulfillment of a role that is normal, depending on age, sex, social, and cultural factors.

Hypothesis: proposition made as basis for reasoning, without assumption of its truth; supposition made as starting-point for further investigation from known facts.

Independent-Living: living independently in the community outside of an institutional setting

Institutional-Settings: nursing homes, homes for the aged, chronic care units in general hospitals or chronic care hospitals, special care facilities, and mental health facilities

Instrument: the tool used to gather data; in the survey undertaken in this thesis, the tool used was a self-administered questionnaire.

Late-Elderly: individuals aged 76 years and over

Leisure Activity: an activity which a person participates in by choice and of their own volition (ie. recreational activities, hobbies, volunteer work, etc.).

Level of Service: A series of characteristics that indicate the quality and quantity of transit service.

Mobility: The ability to move from place to place

Municipality: An area in which the inhabitants are incorporated and powers are exercised by a council composed of elected individuals.

Need: the necessity for presence or possession of

Non-Probability Sample: A sample which does not provide an opportunity to determine the chance that a given population element has of being included in the sample.

Public Transit: A general term used to identify buses, subways, fixed-rail vehicles and any other type of vehicle available to the public which moves relatively large numbers of people on fixed routes at one time.

Random Sampling: A process for sample selection in which every element in the population is given an equal chance of being chosen.

Sample: A part of the population at large selected for the study.

Volunteer: A person who offers to provide services of their own free will.

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CHAPTER ONE

INTRODUCTION

1.1 PROBLEM STATEMENT

The low-density residential environments of suburban areas consist of land-use patterns and transportation channels catering primarily to auto-users. Suburban densities are normally so low that many residents live beyond reasonable walking distance to corner grocery stores and community facilities. Hence, the possession of a car has become a virtual necessity in order to satisfy daily transportation needs (Foley in Hawley et al, 1975).

Certain categories of suburban residents, however, lack access to a private vehicle. Since demand for public transit in the suburbs is much lower than in concentrated metropolitan areas, these individuals are faced with the existence of an infrequent and often inaccessible public transportation system. One such increasingly large group of individuals are certain independent-living elderly suburban residents. Since most elderly are no longer committed to rigid daily schedules, the transportation requirements of these individuals differ considerably from those of younger age groups. "They want to go shopping in the neighborhood or at the shopping center, to the doctor's office, or the senior's center, not downtown to an office or factory" (Carstenson in Waddell, 1976:378).

Although many older people may own a car, with increased age, this vehicle becomes increasingly less available as a result of perceptual, cognitive, physiological, and financial constraints. Foley (in Hawley et al, 1975) has noted that the lowest auto availability rates are found in households with heads under 25 or 65 years and over. In order to get about, therefore, some elderly individuals may develop a strong dependence upon existing public transportation systems. This mode of transportation,

however, is generally oriented toward work trips, and particularly in the suburbs, fails to provide reasonably direct connections to non-work destinations. The use of taxi services, as an alternate mode, is expensive and thus beyond the means of many elderly. Remaining private transportation alternatives, such as dependence on friends or relatives who drive, and on facilities available within walking distance, also have obvious limitations as modes of accessibility (Schmitt in Golant, 1979).

Although most elderly encounter various transportation inconveniences regardless of where they live, suburban independent-living elderly generally face relatively greater mobility difficulties than seniors living in densely concentrated urban areas. "Since suburbia is ecologically less dense than central cities, less contact between the elderly occurs. This condition produces feelings of social isolation which are further compounded by an inadequate system of mass transit..." (Taylor, 1976:42). In consequence, some suburban elderly may find themselves virtually stranded in their own homes.

North American demographic studies reveal that the elderly are increasingly becoming a rapidly growing segment of suburban populations. This trend toward elderly suburbanization, however, is still only in its early stages. The cohort which turns 75 years in 2001 will redistribute seniors into the suburbs resulting in serious cases of elderly suburban isolation around and after the year 2001 (Wade, 1983). It is inevitable, therefore, that this increasingly suburban and diverse elderly clientele, requiring a wider variety of services, will have to be provided with reliable and affordable transportation alternatives.

1.2 PURPOSE

This thesis is concerned with the transportation needs of suburban independent-living elderly who may or may not have access to a vehicle. Many of these individuals must contend with an inadequate public transit system and alternate

modes of transport which may not be easily available. The purpose of the thesis is to examine the transportation habits, car ownership rates, and use of existing public transportation systems of suburban independent-living elderly, in order to determine the type of difficulties and/or mobility impediments they encounter. The underlying intent of the research is to test the following hypothesis: although many non-institutionalized elderly may own cars, they would prefer to use public transit, particularly demand-responsive public transit, provided it satisfied their travel requirements and public transport expectations. This hypothesis is based on the assumption that even though an elderly individual may have access to an automobile, other factors set limits on the times or places to which he/she may drive. Difficulties with vision, particularly at night, often limit older persons to day-time trips, while freeways and complicated traffic conditions can inhibit even daylight driving (Carp in Kalish, 1977).

1.3 METHODOLOGY

The execution of this thesis consists of three steps. The first step involves an examination of existing literature on the travel characteristics, mobility constraints, and public transportation expectations of the elderly. The second research task necessitates the collection of background information on Richmond from the Municipality of Richmond and B.C. Transit in order to acquire the following: a general profile of the study site; a demographic profile of Richmond's elderly; and a description of the existing forms of public transportation available to the elderly in Richmond. The third and major step involves a survey of Richmond's independent-living elderly through a self-administered questionnaire in order to reveal their travel habits, auto availability, reliance upon available modes of public transportation, and any difficulties encountered with the existing public transit system.

1.4 RELEVANCE OF THESIS

Although the suburbs have historically been places where childless couples and the elderly have been relatively unrepresented, the population of these low-density areas has been aging; increasingly more and more elderly are choosing to live independently in suburban areas. Since the residential populations in these areas are more widely dispersed, prevailing land-use patterns make it virtually imperative for households to have at least one car. Those elderly suburbanites lacking access to a vehicle are at a significant disadvantage since they must either rely upon some alternate means of private transport, or existing public transportation systems which are far less adequate than those in central cities.

Certain studies clearly demonstrate that transportation-related services are a crucial need among elderly suburbanites (Taylor, 1976; Koenig et al, 1977; Gutowski et al, 1979). Lack of a vehicle for personal use, however, is only one dimension of their transportation problem. Some suburban elderly express serious reservations about the adequacy of available public transportation services. As Bell (et al, 1974) discovered through a rational analysis of prospective transportation alternatives, public transport is potentially the most appropriate transportation solution to the mobility needs of older people.

The modification of existing public transportation systems in order to promote greater mobility for the elderly would not only increase the physical, mental, and psychological well-being of these individuals, but it would also lead to a significant societal benefit. An overall improvement in health and quality of life would keep older people out of heavily tax-subsidized old-age institutions by allowing them to be self-sufficient in their communities for longer periods of time.

Many North American studies have been undertaken on elderly living in inner-cities, deteriorated neighborhoods, public-housing projects, retirement residences, and

old-age institutions. Relatively few environmental analyses presently exist, however, of the disproportionately large population of independent-living elderly residing in suburban areas (Golant, 1979). Since the mobility patterns and transportation facilities for elderly persons in the suburbs differ from those in central cities (Carp in Kalish, 1977), it is necessary to determine how suburban elderly residents lacking access to a vehicle actually cope, how they go without trips they might take were transportation not an impediment, and how well such residents are served by existing public transport systems. In order to improve the mobility and quality of life for this growing suburban elderly population, it is critical that transportation planners responsible for developing long-range plans and recommending public transit alterations and modifications are aware of the elderlys' distinct mobility requirements and public transit expectations.

1.5 THESIS OBJECTIVES

1. To determine the following mobility behavior and constraints of independent-living elderly from a literature review:
 - a) whether the travel patterns and behavior of independent-living elderly differ from those of the general population.
 - b) the influence of mobility on the quality of life and self-satisfaction of the elderly.
 - c) travel characteristics of the elderly.
 - d) mobility constraints of the elderly.
 - e) functional, psychological, and environmental constraints to the use of public transit by the elderly.
 - f) expectations and suggested improvements placed upon existing public transit systems by the elderly.
2. To describe the existing public transportation alternatives available to independent-living elderly residents of the suburban Municipality of Richmond.

3. To survey a number of independent-living elderly Richmond residents who may or may not use the existing public transportation systems, in order to determine the following:
 - a) Their travel characteristics (ie. frequency, time, and location of travel; modes of transportation employed; specific difficulties in mobility)
 - b) Whether they possess a valid driver's license and own a private vehicle
 - c) Their use of existing public transportation systems within Richmond (ie. B.C. Transit; HandyDART; Richmond Community Leisure Transportation Service)
 - d) Ways in which they perceive the public transit system as preferable to driving a private car
 - e) Any improvements to the bus system which would persuade them to use the bus more often.
 - f) The importance placed upon various features and attributes of existing public transportation systems.
4. To arrive at some conclusions regarding the transportation behavior and impediments faced by some of Richmond's independent-living elderly residents in order to make transportation planners aware of the special needs of this particular suburban population group.

1.6 SCOPE

For the purpose of this study, the following two generations of elderly will be considered:

1. the "early-elderly", aged 60 to 75 years, and
2. the "late-elderly", aged 76 years and over.

The "early-elderly" are generally mobile, active, independent, ready to experiment with different types of work and leisure, and often socially gregarious. Their lifestyle reflects a freedom from responsibilities of work and family and from worries of rapidly

failing health and financial concerns. On the other hand, the "late-elderly" may be subject to health limitations, and hence, restricted in their range of possible activities (Yeates in Golant, 1979).

For the purpose of the survey research, the sample group definition of an independent-living elderly individual is someone who is:

1. 60 years of age or over
2. able-bodied
3. a resident of Richmond
4. not "living in a nursing home, home for the aged, chronic care unit in a general hospital or chronic care hospital, special care facility or mental health facility"

(Ontario Publication, 1985:29).

The decision to use independent-living elderly as the study group for this thesis is based on the following reasons:

1. Since seniors are a rapidly growing segment of suburban populations, an understanding of the unique mobility needs of these individuals is crucial to any future planning decisions which hope to improve upon their quality of life.
2. Since a significant number of independent-living elderly either do not own or lack access to a private vehicle, they are labelled as "transit-captive". In order to offer any suggestions for improving existing public transportation systems, it is important to consider the unique mobility needs and expectations of this relatively large transit-captive clientele.
3. Since independent-living elderly are generally more agile than institutionalized elderly, they are likely to make greater use of available modes of public transport. As dependent and thus relatively frequent users of local public transport systems, the needs and expectations of this specific clientele become very valuable to suburban public transportation planners.

The decision to use the suburban Municipality of Richmond as the case study location for this thesis is based on the following reasons:

1. The specific intention of this study is to analyze the transportation characteristics and mobility difficulties of independent-living elderly residing in a suburban environment.
2. A "Senior Citizen Survey" carried out by the Richmond Planning Department in June 1982, focused upon those Richmondites over 65 years of age and the degree to which the physical environment of the community played a role in enhancing or constraining the quality of life of these older residents. As part of this study, a number of questions pertaining to accessibility of services and transportation were asked of the respondents. Richmond has been chosen as the case study location in order to expand upon some of the transportation issues and concerns of the elderly that have already been raised in this particular survey.

1.7 THESIS ORGANIZATION

Chapter two summarizes existing literature on the importance of mobility to the lives of the elderly, their unique travel patterns, mobility needs, public transit expectations, mobility constraints, and the nature of their daily activities.

Chapter three consists of a review of current literature on public transportation systems and the elderly. Topics such as the dependence of elderly upon public transportation, differences in use of public transit by age and sex, functional and psychological barriers to use of transit, benefits of demand-responsive transportation systems, and specific strategies aimed to improve the mobility of the elderly are discussed.

Chapter four presents a brief description of the existing public transportation alternatives available to the independent-living elderly within the suburban Municipality

of Richmond, along with an elaboration upon the physical characteristics and demographic profile of the study area.

Chapter five explains the methodology employed in the survey of eighty-five independent-living elderly Richmond residents. In addition, the results of this survey are presented.

Chapter six presents a discussion of the findings revealed in the survey of Richmond's independent-living elderly.

Chapter seven presents the conclusions and planning implications of the thesis derived from the results of the literature review and the findings of the survey.

CHAPTER TWO

MOBILITY AND THE ELDERLY

2.1. Demographic Characteristics of Elderly in Canada

The number of older people in Canada is increasing dramatically. By the year 2001, it is estimated that 3.0 to 3.3 million people will be over the age of 65, representing about 12% of the total population (Penning, 1980). The number of late elderly (75 years and over) within this growing elderly population will likely demonstrate the most substantial rise in numbers. "These 75 and over citizens will comprise approximately 50% to 55% of those aged 65 and over by 2041" (Segalowitz, 1981:1).

Since women live longer than men, the proportion of elderly females will be significantly greater than the males. In fact, over the period of 1981 to 2026, "the proportion of elderly females will increase from 38% to 46% more females than males" (Wade, 1983:ix). A large number of these older women will be widowed, with many surviving on minimal incomes and little outside assistance.

Wade (1983) reveals the Canadian seniors' household pattern to be as follows: 66% share home with kin, 4% share home with unrelated persons; 22% live alone; and 8% live in collective institutional-settings. A large portion of the elderly living on their own are women. Such single-person elderly households may experience lack of companionship and social isolation since reliance on a spouse is not possible. Furthermore, access to a vehicle for personal transportation is less likely, particularly for single elderly females who matured in an era when driving was mainly the responsibility of males (Gutowski, 1979).

2.1.1. Growth of Elderly in the Suburbs

A recent Canadian study has predicted a strong trend over the next twenty years of a shift of seniors to suburban areas, living primarily in private housing (Wade, 1983). Since 1950, however, the suburban elderly population has already been increasing faster than the total suburban population so that, today, the elderly population within metropolitan areas has become decentralized due to its greater occupancy of suburban residential locations (Golant, 1979). Increasingly, many older, retired individuals are regarding suburban areas as more attractive and suitable living environments than central city locations (refer to Table 1). In the future, therefore, the residential choice of many elderly is expected to be suburban locations. Since most of today's suburban elderly live in private housing, it is expected that the bulk of these future elderly suburbanites will choose similar independent-living accommodations.

Two main theoretical explanations for the steadily increasing concentration of older people in the suburbs can be detected in the literature. The initial explanation is attributed to the "aging-in-place" of present population structures. The number of elderly living in the suburbs will continue to grow primarily because of the large proportion of pre-elderly households already residing in these areas. These pre-elderly households can be expected to age-in-place, contributing to a trend of elderly suburbanization. This trend is also enhanced by a tendency for many older households to migrate toward the suburbs, since as Golant (1979) discovered, suburbs are the most preferred destination of older movers.

The second explanation for the steadily increasing growth of elderly in suburban areas is explained by the "Spatial Equilibrium Model". This model claims that since most places of employment are located either in or close to the city center, retirement relaxes the pull to live near the center in order to minimize financial and time costs. Since most members of the older population are no longer employed, and hence, the

TABLE 1**FACTORS MAKING SUBURBAN AREAS ATTRACTIVE TO THE ELDERLY**

1. The identification of suburban areas as residentially stable locations.
2. The proliferation of regional and neighborhood commercial and institutional centers and districts outside central cities of metropolitan areas making the CBD only one of the many activity centers to which accessibility is important.
3. Lower prices and higher quality of consumer goods.
4. An increase in the number of multi-family apartment units outside central cities in metropolitan areas, facilitating moves to smaller, less expensive housing quarters.
5. The increased availability of public housing units, and various types of retirement housing designed for older people.
6. The availability of smaller owned units for older persons seeking to remain owner-occupants.
7. A view of suburban areas as safer places to live because of perceived lower crime rates and low automobile traffic levels.
8. A view of suburban areas as being smaller scale, less congested and complex, and easier to use.
9. An assessment that air is cleaner.
10. A growing proportion of persons living alone, separated, divorced, or who were never married living outside central cities in metropolitan areas. Thus these locations are socially attractive to older persons, a high number of whom have comparable statuses.
11. The pattern of earlier central-city suburban migrations increasing the probability that the older person's children or other relatives will be living outside central city locations.

12. The increased likelihood that members of more recent generations of older persons will be automobile drivers facilitating residential occupancy in locations requiring accessibility by car.
13. A more attractive regional location.

*Golant, Stephen (1979), Location and Environment of Elderly Population. (p.48)

journey-to-work constraint is not applicable, older persons tend to migrate out of central cities dispersing over the suburban fringe areas of metropolitan regions where land and housing are cheaper (Rudzitis in Golant, 1979:56).

2.1.2. Health of Elderly

Although there is a tendency to associate old age with increased disabilities and reduced capacity for movement, "80% of elderly are functionally capable of living independently and caring for themselves" (Wade, 1983:4). Most elderly individuals have no health-related limitations and those that do are still relatively mobile. Since most elderly are ambulatory, they continue to live in the community. Only about 3% to 5% of elderly are permanently institutionalized and another 5% are limited to their homes by a chronic condition (Libow in Cantilli et al, 1972). In fact, Gombeski (1980) discovered that most elderly did not, according to their own opinion, have serious health-related mobility problems as might have been expected from some of the existing present-day elderly stereotypes.

Although most seniors do not need to limit their activity level due to declining physical health, the age of 75, however, has been pinpointed as a broad cut-off point for sustained and declining physical activity characteristics in the elderly population. Extreme rates of disability (ie. hearing, visual, and mechanical disability) have been detected in this late-elderly age category (Wade, 1983).

All individuals, regardless of how fast they age, however, undergo certain recognizable physiological changes during the normal aging process. These changes are not necessarily related to pathological conditions of disease or chronic ailments, but can nevertheless affect behavior, needs, and desires. Such physiological changes include the following:

1. Changes in posture and height, and a loss of muscle power affecting the body's

efficiency and ability to perform daily tasks.

2. Changes in motor performance resulting in hesitancy and slower responses. "With age, the amount of coordination that the central nervous system can handle becomes more limited. This is compensated by extra time and is a major cause of older persons' slowness in performance" (Libow in Cantilli et al, 1972).
3. Changes in the nervous system, decreasing tactile discrimination, speed of reflexes and recovery of balance, and some impairment of short-term memory.
4. Adaptation to light is slower and vision becomes less accurate (ie. peripheral vision is reduced and sensitivity to glare increases). At the same time, the elderly person becomes more dependent on visual cues as other senses deteriorate.
5. Changes in sensory acuity (ie. hearing, speech, smell, vision, taste and touch); older people normally undergo a slight loss of peripheral vision and also develop presbyopia (far-sightedness). In addition, "5% to 13% of women and 7% to 17% of men over 65 have a significant hearing loss" (Libow in Cantilli et al, 1972).
6. Changes in mental acuity, including loss of memory (particularly short-term), disorientation in time and place, loss of ability to do simple calculations, and reluctance to adjust to change. (Segalowitz, 1981:5-6)

2.1.3. Heterogeneity of the Elderly

The process of aging varies for everyone since it is a product of biological, psychological, and social phenomena. Although chronological age may often be used as an indicator of an individual's position in one's lifetime, it is at best, only a rough indicator of the rate at which an individual is aging (Golant, 1979).

In general, the term "elderly" refers to a diverse population with individual needs and roles varying enormously according to social, psychological, and physical characteristics. Amongst this age cohort, there are wide variations in economic and health status, education, age related experiences, sex, social class and social isolation,

each of which implies corresponding differences in desired lifestyle and the primacy of social, medical, economic, or other needs (Penning, 1980).

M. Powell Lawton, in his extensive gerontological research, has compiled a number of common elderly characteristics, however, in order to arrive at his own generic description of the 'average older person':

Most older people are in reasonably good functional health... and relatively mobile within the confines of the neighborhood or community. They are likely to live either with their spouses, or less frequently, with other family members....By far the greater portion of the day is spent in the home, allocated among household duties, watching television, resting, and regrettably, "doing nothing". In many ways, this average older person is quite similar to people in general, but she must expend a greater proportion of her energy to master problems associated with income, housing, health care, and social interaction. (Lawton in Byerts et al, 1979:10)

2.1.4. Activities of the Elderly

Most individuals over the age of 65 years are no longer employed, and those who continue to work do so only on a part-time basis. In consequence, members of this age group have much more time at their disposal. Some North American studies, designed to determine the leisure time activities participated in by members of the elderly population, show findings which are relatively similar.

Bernhardt (in Waddell, 1976) reveals that the elderly spend their time reading books, sewing, gardening, attending church activities, and going out to eat. In a study carried out in the State of Minnesota, the top five recreation activities participated in by the elderly most often were the following: visiting friends and relatives; watching television; reading; gardening; and indoor hobbies. The most prevalent problems preventing active participation were lack of physical ability, companionship, time, transportation, and finances (McAvoy, 1979).

A similar study carried out in Vancouver revealed the five most common forms of recreation and leisure activities participated in by seniors to be reading, watching

television, listening to radio; attending community centre events; and walking (Auger, 1981). A more extensive study of seniors residing throughout the province of B.C. found visiting a friend's home, visiting a relative's home, attending a church service, and attending a senior citizens' activity as the four most frequent activities undertaken during the previous month (Koenig, 1977).

Although these patterns of activity for the elderly may be similar to other groups, their activity level for each is significantly lower. In almost all instances, the elderly participate in recreation activities far less frequently than do members of other age groups.

2.2. Mobility and the Elderly

Mobility is essential to the physical, social, and psychological well-being of the elderly. Access to medical facilities and other social services is critical in order to remain healthy. An active social life in old age depends upon accessibility to family and friends as well as recreational and cultural activities. Mobility also provides the elderly with freedom from isolation and the independence to choose one's range of activities (Wachs, 1979:1). For the elderly, therefore, quality of life depends, to a very large extent, on available and accessible transportation as it is the mediator between themselves and the environment. The important contribution of transportation to the quality of life of the older person is supported by abundant research linking morale with transportation opportunity.

As Koutsopoulous (1976:72) reveals, ...poor transportation service has had a significant adverse effect on the quality of life for the elderly in many urban areas. It has led to social isolation and has kept some persons from regular access to even minimal life-sustaining functions.

In a study evaluating the socio-psychological effects of inadequate transportation on older people, Gonda (1982:67) discovered that "mobility constraints may contribute to increased feelings of loss of control which may lead to feelings of helplessness, dependence, incompetence and depression... [all] negative reactions [which] can precipitate socio-cognitive and physical deterioration". Further, Fine (1975:472), revealed that since increasing the mobility of the elderly has an indirect effect on health, improved transportation for the aged may be expected to have an effect on related attitudes, such as life satisfaction and ego integrity. An improvement in the psychological sphere of the elderly person should not only contribute to making the person feel better, but should also contribute to improved mental and, indirectly, to improved physical health. Finally, Cutler (1975:158) discovered that after removing the effects of health, income, age, sex, and residential location, a greater proportion of elderly without an adequate means of transportation show declining life satisfaction than those with such transportation.

2.2.1. Mobility and Environmental Constraints of the Elderly

Although the elderly are often perceived to be frail and immobile, most seniors lead busy and relatively mobile lives. Older persons' constricted use of their community, therefore, is in large part a function of environmental and organizational barriers rather than an expression of their intrinsic personal mobility difficulties (Carp, 1980).

Mobility constraints of the elderly can be classified into three categories: physical constraints; psychological and informational constraints; and socioeconomic constraints (Koutsopoulos, 1976). The first category consists of physical conditions that may reduce mobility and affect vehicle and transit usage. These conditions include ambulatory limitations such as difficulties in walking and/or standing for long periods of time. In addition, many older people suffer from vision and hearing limitations which hinder their

mobility. Finally, since the motor skills of certain elderly individuals are weak, they may have trouble with balance, particularly on crowded buses.

The second category of psychological and informational constraints include perceptual barriers that inhibit seniors' use of public transit or alternate transportation modes. Some elderly may be fearful of crowds while others may simply dread the possibility of getting lost, and hence not being able to reach their desired location. Furthermore, some elderly may regard the use of public transit as too complicated and inconvenient. Finally, the elderly are often unaware of the daily times at which they may travel since transit schedule information may be difficult to obtain.

The final category of mobility constraints are socioeconomic. These constraints include barriers such as lack of financial resources which indirectly influence such factors as car ownership, public transit use, and dependence upon others for rides. In addition, this category includes the concept of discretionary time. Some elderly may have ample time to travel while others may be fairly restricted.

Along with the above physical constraints, the elderly may also encounter certain environmental constraints. These are limitations imposed upon the elderly by the physical and social environment in which they live. "Often an elderly person may need to undertake a shopping, health, or recreational trip but existing external or environmental difficulties prevent the activity-customer linkage from taking place" (Koutsopoulos, 1976:77). If the elderly are unable to satisfy daily needs within their own neighborhood and transportation to outlying destinations is unavailable, locational barriers to mobility are evident. In particular, elderly residing in suburban areas face significant locational mobility barriers since most transportation modifications are oriented toward better accessibility to the Central Business District. In consequence, the transportation services offered virtually preclude reverse commuting or lateral movement.

The elderly also face environmental administrative constraints. "Clearly, metropolitan transportation planning focuses on movement requirements for the whole metropolitan area, and in this approach it may be financially and politically expedient to overlook the requirements of [the elderly].... This is why [the elderly], as a small subsection of the metropolitan population commonly do not receive the attention they deserve, nor do they have a voice in the transportation planning process" (Koutsopoulous, 1976:80). The mobility difficulties of the elderly population stem from a host of constraints that range from physical and mental limitations to the inability of administrators and planners to meet their needs. The mobility of the elderly can only be improved once their mobility constraints are given greater consideration in urban transportation planning decisions.

2.2.2. Transportation Problems of the Elderly

Over a lifetime, an elderly individual has compiled a number of cognitive maps and motor skills which enable him to go where he wants to go. "As transportation systems change and the individual's own sensory and motor capabilities change, the older person's deeply ingrained learnings become inappropriate at the same time that his sensory acuity diminishes, his strength and agility decline, and his responses slow. The changes in transportation systems interact with aging processes to augment older people's difficulties in going places since perceptual-motor task complexity and the pressure for speed penalize the older person" (Carp in Kalish, 1977).

Along with the internal aging process, an older person's residential location also plays a significant role in any possible transportation problems. The availability of transportation facilities varies from high-density concentrated areas to low-density residential regions. There is harm that older individuals lacking access to a vehicle and encountering an inadequate transportation system may become socially isolated and thus overly dependent on others.

Studies undertaken to examine the needs of the elderly repeatedly reveal that the quality of transportation available to seniors is very important. "Research indicates that while money, health, and transportation are most often mentioned by older people as impediments to their desired lifestyle, nearly one third name transportation as the most serious problem and many indicate that the worst consequence of poverty or health problems is the inability to go places" (Richmond Planning Dept., 1982). This result is further accentuated in a survey on aging carried out in the U.S. which revealed transportation to be one of the three biggest problems perceived by older people (Carstenson in Waddell, 1976).

Since transportation ranks as the third largest expenditure in the average retired couple's budget, immediately following food and housing, it plays a crucial role in the lives of the elderly. The true importance of transportation for the elderly, however, lies in the dependence of many other activities on transportation services. Without adequate transportation, the elderly find it very difficult to confront the simple tasks of daily living.

The issue of inadequate and/or insufficient public transportation has been detected in research undertaken on the environmental perceptions and problems of the elderly. For example, in a study of seniors residing in the province of B.C., it was discovered that, from a number of various factors, "the seniors of B.C. were least satisfied with the transportation services available to them"; in fact, "nearly 60% of the respondents stated that public transportation in their area was either unavailable or unsatisfactory". Available public transportation was regarded as being either too infrequent, not close enough, too expensive, or too crowded (Koenig, 1977). In addition, a study which analyzed the transportation needs of the elderly in Vancouver revealed that persons using local public transportation as their only means of transportation indicated concerns with its effectiveness (Auger, 1981).

Some older individuals, due to their personal circumstances, encounter greater transportation problems than others. In particular, Taylor (1976) found that lower income elderly generally place a greater emphasis on transportation needs than upper-income elderly. The transportation problems of low-income elderly are magnified since transportation options for those with little money are relatively few. Most elderly, regardless of their financial circumstances, however, experience a sharp reduction in income at the time of retirement, thus the transportation difficulties of low-income individuals may not be so uncommon.

Finally, "elderly women, particularly the oldest [75 years and over], ...continue to make up the single largest group of transportation disadvantaged" (McGhee, 1983:511). Taylor (1976) revealed that by almost every indicator, women proved to be in a much worse economic position than men. Women owned fewer homes, generally paid lower rents for poor quality housing,...and indicated greater needs in transportation. Generally, the possession of a vehicle and a driver's license is considerably lower for women aged 65 years and older than for older men (McGhee, 1983). Many older women, often widowed, never learned to drive, depending instead on their husband for transportation. Consequently, transportation problems seem to be reported most often by widowed respondents [and] by women (Ontario Study, 1985).

2.2.3. Transportation Problems of Suburban Elderly

Although most elderly individuals, regardless of where they live, encounter certain transportation problems, the elderly population living in the suburbs is faced with greater transportation difficulties. Suburban elderly households are far more likely to report inadequate transport services than central-city households. Since suburban areas are less densely developed than central cities, services such as public transportation, shopping facilities; and clinics tend to be less accessible (Gutowski et al, 1979).

Taylor (1976) found transportation to be the most significant need of suburban elderly in his comprehensive case study of elderly in the New Jersey suburb of Clifton. Transportation difficulties faced by suburban elderly are not surprising since suburbia does not possess the mass transit facilities of central cities. Consequently, the elderly are forced to rely upon family and friends or more expensive forms of transportation. Since transportation has direct ramifications on the leisure and socializing patterns of suburban elderly, the social isolation of these older persons is exacerbated without it.

Suburban elderly generally face transportation alternatives that are either non-existent, inefficient, or ineffective. "The cost of providing public transit service in suburban areas is quite high owing mainly to the low density of demand, long passenger trips, low vehicle utilization, and the inability to efficiently coordinate supply and demand" (McKelvey in Golant, 1979:136). Since reliance on the automobile is one of the most significant characteristics of the suburban lifestyle, the transportation needs of suburban elderly increasingly become a paramount issue.

In his study, Wade (1983) discovered an increasingly large proportion of predominantly single senior females in urban Canadian suburbs (Wade, 1983). Since elderly women appear to suffer from inadequate and inaccessible transportation to a greater extent than older men, the increasing predominance of women in the suburbs reveals that transportation difficulties of suburban elderly will continue to be a significant problem in the future.

2.3. Transportation Needs and Travel Behavior of the Elderly

2.3.1. Transportation Needs of the Elderly

Since need is a multi-dimensional concept, it is difficult to define. In this thesis, the concept of need will be referred to as "the necessity for presence or possession of" (Concise Oxford, 1982). The transportation needs of the elderly, therefore, are those means of transportation and/or transportation-related services necessary for the elderly to have access to in order to carry out their regular daily activities.

The elderly, however, are a diverse and active cross-section of the population and their considerable differences in lifestyle, health, and economic status lead to wide variations in the transportation services and facilities that are both needed and preferred. McGhee (1983) noted that the extent of the elderly's need for transportation is based on eight main distinguishers: vehicle ownership; self-rated health; satisfaction with neighbors; income adequacy; living arrangement; education; siblings living close by; and trip purpose activity. In general, however, the outstanding unmet need of the elderly is the lack of access to resources and the importance of community or neighborhood accessibility (Richmond Planning Department, 1982).

2.3.2. Travel Patterns of the Elderly

Suburban elderly residents most frequently travel within the vicinity of their own neighborhood, although certain destinations entail travel outside of this sphere. Since only a selected number of stores, other facilities, friends, and possible points of contact are normally located nearby, the elderly require transportation beyond the range of walking in order to reach more distant destinations. Studies carried out in Philadelphia and Regina have determined specific measures of critical distance for senior access to selected facilities largely based on surveys of elderly travel behaviour (refer to Table 2).

TABLE 2**CRITICAL DISTANCE MEASURES TO SELECTED FACILITIES**

Facility	Rank of Importance	Critical Distance	Recommended Distance
Grocery Store	1	2-3 blocks	1 block
Bus stop	2	1-2 blocks	adjacent to site
House of worship	3	1/4-1/2 mile	1/2 mile
Drug store	4	3 blocks	1 block
Clinic or hospital	5	1/4-1/2 mile	1 mile
Bank	6	1/4 mile	1/4 mile
Social Centre	7	indeterminate	on site if feasible
Library	8	1 mile	1/2 mile
News/Cigar Store	9	1/4 mile	1/4 mile
Restaurant	10	1/4-1/2 mile	no consensus
Movie house	11	1 mile	1 mile
Bar	12	indeterminate	no importance

Notes:

- 1: Based on the number of times facility mentioned as "important" in the location of a housing development for the elderly.
- 2: Based on the actual distances from a given facility in cases where dissatisfaction had been expressed by residents
- 3: Based on the apparent consensus of the respondents as to the proper distance to each facility.

Source:

Paul Niebanck and John B. Pope, *The Elderly in Older Urban Areas* (Philadelphia: University of Pennsylvania, Institute for Environmental Studies, 1965) p. 64.

A number of studies have been undertaken to examine the general travel patterns of elderly, both within the vicinity of their residence and to more distant destinations. Ashford et al (1972) discovered that in general, elderly are more likely to travel outside their zone of residence than the average urban tripmaker. In addition, for non-work trip purposes which account for most of their travel, the elderly can be expected to be more wide-ranging in travel than their younger counterparts. Cohen et al (1980) revealed the most important reasons for elderly travel to be grocery shopping, non-grocery shopping and recreation. Religious, medical and business travel combined barely accounted for more than 25% of the trips taken by any single mode.

In an extensive study carried out in San Antonio, Texas, the most frequent trip destinations listed by the elderly in order of frequency, were for the following purposes and destinations: visiting friends; visiting children; visits to other members of the family; doctor; church; grocery shopping; other shopping; and finally, senior centers (Carp in Kalish, 1977). Furthermore, Revis (in Waddell, 1976) found that, in particular, shopping, social, and recreation trips are especially important for the elderly. While senior citizens are much less likely to shop at discount stores, they enjoy travelling to downtown shopping districts.

Although the above studies depict the general travel patterns of elderly individuals, it is false to assume that this travel behavior reflects actual travel desire or need. Mobility constraints, such as physical handicaps and financial problems, may prevent the transportation needs of the elderly from being adequately satisfied. Consequently, there may be a considerable gap between travel behavior and travel need, often referred to as latent demand. Wade (1983) notes that social and recreational activities show the greatest expression of latent demand amongst the elderly, while basic needs, such as medical trips, are generally fulfilled and have less latent demand. An important factor contributing to much of seniors' latent demand is lack of adequate transportation services.

2.3.3. Travel Behavior of Elderly and Younger Counterparts

Generally, transportation improvements for the elderly are considered in conjunction with system alterations designed to serve the general population. The possibility that the elderly have notably different travel desires which reflect an individual's changing use of time with age is often ignored. Seniors, in general, adopt a different lifestyle than employed persons through loss of employment, family raising, and education. They also experience a significant decrease in income (approximately 50% average income decrease) and increasing incidence of physical disability. Generally, therefore, older people have more restricted patterns of action within the environment (Wiseman, 1978:15). The most obvious difference in travel behavior between the elderly and their younger counterparts, however, is the decrease or elimination of trips to work and the increase in trips for social, medical, and leisure activities (Schmitt in Golant, 1979).

Although discrepancies in travel frequency or behavior between the elderly and the general population may appear insignificant, Cohen et al (1980:272) noted the following:

There are in fact subtle, but important, differences in the travel pattern of the elderly [as a specific subpopulation]. For them, the frequency of shopping trips and medical service trips is greater than for the general population; travel is more likely to occur during non-peak working/commuting hours; a large percentage of travel is in vehicles owned by friends or relatives; and the physically able walk to many destinations close to their residence but use motorized vehicles for more distant places.

Golant (in Altman et al, 1984:259) revealed that the frequency of vehicular trip behavior such as auto, public transit, or taxis is lower for older people (over age 65) than for younger populations. Also, with increased age, such vehicular activity becomes increasingly oriented to nonwork trips and disproportionately occurs during the daytime hours.

In addition, Revis (in Waddell, 1976:350) discovered that in contrast to typical trip purpose analyses in which no benefit is attached to the trip other than for the end purpose for which the trip is made, older persons often take trips because of their need for socialization. The trip itself is often an event to look forward to, and making the trip becomes an important trip purpose in and of itself.

Unlike younger individuals, the elderly frequently become discouraged by a succession of various obstacles: "high bus steps, the need to cross wide, busy streets to catch a bus, fast-changing traffic lights, high curbs and inadequate building lables. Furthermore, many elderly may do without banks, doctors, repair services, dentists, shops, lawyers and parks because of the energy it takes to get to them" (Golant, 1979:2).

Finally, attitudes regarding transportation are also sharply differentiated between the elderly and the general population. For example, Ashford et al (1972) found younger individuals to be more willing to allocate greater expenditures and effort to roads and highways, and to be somewhat more favorably disposed to the automobile as compared to public transportation. In addition, they were more critical than the elderly of all transportation modes.

2.3.4. Travel Behavior of Early and Late Elderly

Generally, early-elderly individuals (60-75 years) are quite mobile, while late-elderly persons (75+ years) are often subject to health limitations which tend to restrict their range of activities. Although Wade (1983) discovered that the prevalence of physical disabilities among the early-elderly is not appreciably higher than for younger age groups, it is among the late-elderly that physical disabilities, such as musculoskeletal and sight impairments, start to become a problem. In consequence, the early-elderly have distinctly different travel behavior than the late-elderly - more and

longer trips, more work trips, and greater use of autos (Wade, 1983).

The early-elderly of the future are expected to exercise a much wider range of choices regarding living arrangements and travel patterns, while the late-elderly may become more dependent upon public transportation. Whether such transportation services in low-density suburban locations will be provided, or the late-elderly will be relocated to central facilities where such services can be effectively delivered, the consequences for the late-elderly of the future are likely to be significant (Wachs et al, 1975:15).

2.3.5. Travel of Suburban and Central-City Elderly

Carp (1972) noted that suburban elderly residents travelled more than elderly individuals residing closer to the center of town. "The incidence of trip-making tended to be highest among residents of the new suburbs at the periphery of the city, next highest for those in the old suburbs, and so on toward the center of the city. The lowest incidence of travelling occurred among the people who lived within a few blocks of the very heart of the city".

Furthermore, Wachs (1979) discovered that the use of public transportation was especially high for elderly residents of inner-city areas, while the automobile was the predominant mode of travel among suburban elderly.

2.4. Modes of Transportation Available to the Elderly

Five potential modes of transportation are available to most elderly individuals: the automobile; riding as a passenger; walking; taxi/school buses; and either fixed-route or demand-responsive public transit. This section will briefly discuss the first four of these transport alternatives; public transportation as a mode of travel will be elaborated upon in the next chapter.

2.4.1. The Automobile

Automobile ownership for the elderly, especially in suburban areas, has been found to be quite high. A study carried out by the Richmond Planning Department (1982) noted that 68.8% of the elderly (both homeowners and senior-housing occupants) surveyed owned their own vehicle. For Canada as a whole, the car ownership rate in 1976 for married seniors was 60%, compared to a rate of 18% for unattached seniors. In addition, the rate of car ownership for seniors residing in urban settings was 75%, while for rural elderly, the rate was 25% (Wade, 1983). These figures would appear to illustrate that the automobile serves the transport needs of the elderly better than any other mode of transportation.

Although many early-elderly individuals may own a car, Gutowski et al (1979) found that the lack of a vehicle for personal transportation is a major problem for elderly renters and suburbanites over 75 years of age, regardless of tenure status. The high car ownership rate amongst the early-elderly, however, does not necessarily imply car availability. The elderlys' access to a vehicle may often be limited since they may frequently share the vehicle with other, possibly younger and more mobile members of the household. The car also becomes increasingly less available due to perceptual, cognitive, physiological and financial constraints. In addition, most elderly drivers recognize or set some limitations on their driving. Difficulties with vision, particularly at night, may limit older persons to day-time trips. Carp (in Cantilli, 1972) noted that even in the daylight, many elderly individuals were unwilling to drive on expressways, or downtown, or in new parts of town, while some drove only within their immediate neighborhood. "Of those older persons who do not have automobiles, licenses, and insurance, probably only about half feel they can drive everywhere they need and want to go. This is reflected in a lower average number of miles driven annually by older drivers" (Carp in Byerts et al, 1979).

As age increases, there is a tendency to become more dependent on others for transportation because of a physical inability to drive oneself, pass the driver's test, afford automobile insurance or the cost and maintenance of an automobile" (Gombeski et al, 1980:455-456). In a study which surveyed 145 elderly residing in the GVRD, it was revealed that although 46 persons owned their own cars, many were worried about the costs of maintenance, repair, gasoline, and insurance. For example, one 66 year-old respondent claimed, "I have an old car which I use very seldom. I just can't afford to drive it with expenses of gas and insurance so high." (Auger, 1981).

2.4.2. Riding as a Passenger

For the elderly lacking access to a vehicle, travelling by car as a passenger is the most common means of alternate transportation. In fact, Carp (1972) discovered that riding as an elderly passenger in a private automobile was second in preference only to driving oneself. For most elderly, however, the opportunity to ride as a passenger is so infrequent as to be inadequate in meeting their transportation needs. Carp (1972) discovered that although most respondents were offered rides at least upon occasion, only half could depend on weekly rides, and very few were driven someplace almost daily. In addition, nervousness, the inconvenience of tailoring times and destinations to fit the plans of the driver, and feelings of dependency and obligations which cannot be repaid were other disadvantages cited by elderly riders.

Generally, rides for family visits, to the doctor, and for food shopping are often provided to the elderly by family members living near-by. These close-of-kin, however, do little to supply such transportation to other destinations. Furthermore, a large proportion of old people receive no transportation assistance because family members may live far away and rides with unrelated people are very scarce.

The elderly appreciate rides by others for the following reasons: good source of transportation by providing them with the access to go where they want to go; enjoyment and the opportunity to socialize with someone along the way; convenience; and the fact that for many older people, being taken in a car is easier than walking or taking the bus.

2.4.3. Walking

Revis (in Waddell, 1976:369) has noted that "the aged have been alternatively described as 'captive' pedestrians, the victims of deficient public transit and limited access to private automobiles; or in a position to be 'enriched' by the satisfactions of walking". Walking is important both as a mode complete in itself, and as a supplementary mode by which one gets to or from his auto or public transportation. Although walking provides a potentially effective means of physical mobility, it presumes relatively good personal physical condition and land-use arrangements such that the desired destinations are within reasonable walking range.

Many elderly people are totally or partially dependent upon their feet to take them places. Health problems that impede walking, however, are more common among the old. Fears among older pedestrians include fear of falling, being hit by a car, being attacked, and getting lost. These apprehensions appear to be justified since in the U.S., people 65 and older contribute to a quarter of the pedestrian deaths (Carp in Byerts et al, 1979).

A study of retired persons living in San Antonio, Texas revealed walking to be the most commonly used mode of transportation for going to the library, to the senior center, to visit friends, and to church (Foley in Hawley et al, 1975). It was regarded as an inexpensive form of transportation ideal for one's health. The elderly complained, however, that destinations were often too far to walk to and that walking was highly

dependent on the weather.

2.4.4. Taxis/School Buses

Taxis have small utility in meeting the mobility needs of the elderly since such service is quite expensive, and thus restricted only to those who can afford it. As a result, taxis are used much less frequently by the elderly than public transportation (Ontario Study, 1985).

Consideration has been given to other existing equipment not in full use for the elderly. School buses stand idle during a quarter of the year and much of the day during school sessions, as well as on weekends. Although the use of school buses for the elderly seems an obvious solution, the equipment is often cheap and the buses are generally built on truck rather than passenger-vehicle chassis. Consequently, the ride is uncomfortable and may even be potentially dangerous to the elderly. Entry and egress are quite difficult, and would be especially so for old people. Furthermore, although school buses are left idle for certain hours of the day, these hours are in fact too short of a time to be able to comfortably and safely transport elderly in between school hours (Revis in Waddell, 1977:354-358)

2.5. Transportation Modes Employed by the Elderly

The transportation modes used most frequently by the elderly to reach their destinations differ significantly depending on place of residence. A study of elderly residing in Ontario revealed that the largest proportion (at least 40%) of respondents drove themselves when going shopping, to medical appointments, or to social occasions. Overall, the use of public transportation was quite low (Ontario Study, 1985).

In a survey of 145 elderly residents within the GVRD, the most common forms of travel were cited as: Bus - 57; Own car - 46; Walk 10; Dependence on family/friends - 7 (Auger, 1981). Cohen et al's (1980) study revealed the following findings regarding seniors' use of transportation modes: Dependence upon friend's or relative's vehicle (39.7%); Own private vehicle (35.3%); Walk (18.5%); Bus (3.0%); and Taxi (1.0%).

In a study undertaken in the suburb of Richmond, B.C., the most employed mode of transportation by the elderly for both grocery shopping trips and social contacts was by far their own vehicle, either driven by themselves or their spouse. Walking, public transit, and being driven by family or friends placed a distant third behind the use of an automobile.

CHAPTER THREE

PUBLIC TRANSPORTATION AND THE ELDERLY

3.1. The Role of Public Transportation

3.1.1. Dependence of Elderly Upon Public Transportation

Although many elderly persons possess their own vehicle, studies reveal that older drivers are not only less likely to drive everyday, but they also tend to avoid night and winter driving. In particular, the late-elderly, expected to be the fastest growing segment of the elderly population, experience the most significant driving difficulties. Since most elderly recognize their own driving capabilities, many of the limitations they face in their driving are self-imposed. These limitations subsequently lead to a dependence upon some alternate mode of transportation in order to satisfy daily needs. Since taxi transportation on a frequent basis is too expensive, and destinations, especially in the suburbs, are often too far to walk to, the elderly must rely upon others for transportation. Their strong desire for independence, however, rules out constantly asking others for rides. If the transportation needs of the elderly are to be met at all, therefore, they must increasingly be served by public transportation systems and facilities. Public transportation, therefore, emerges as the most appropriate transportation solution to the mobility needs of elderly people. Without such transport, many relatively mobile elderly individuals would be forced into social isolation.

Public transportation in the suburbs, however, is generally either unavailable or largely inadequate. In a study undertaken in the suburb of Clifton, New Jersey, such transportation was identified as the most significant need of suburban elderly residents of all income groups (Taylor, 1976). In another study of elderly residing throughout

B.C., inquiries concerning transportation available to the elderly indicated that although a large portion of the sample owned a private automobile, many seniors lacked access to satisfactory public transportation. A breakdown of the data by socio-demographic variations identified elderly women in their later years of retirement, living without a spouse, and in low income bracket, as disproportionately dependent upon public transit. Overall, however, almost 60% of the respondents stated that public transportation in their area was either unavailable or unsatisfactory, because it was either too infrequent, not close enough, too expensive, and too crowded. In fact, these individuals were less satisfied with the available transportation than with any other existing service or facility (Koenig et al, 1977).

3.1.2. Distinction Between Elderly and Handicapped

Although the elderly and handicapped are often placed into the same need category for transportation services, the two groups are substantially different. As Wachs (1978:9) aptly describes:

By lumping together the phrases 'elderly' and 'handicapped', transportation policy makers have created a stereotype which is not valid. These two phrases, taken together, refer to millions of people who include rich and poor, suburban and central-city dwellers, drivers and non-drivers, and so on. The majority of the elderly are not handicapped, and the majority of the handicapped are not elderly. Service requirements for non-handicapped elderly may be vastly different from those for non-elderly handicapped persons. By lumping two labels together, an image is created of homogeneity and this in turn may ultimately create competition between these diverse groups for resources and programs which meet the needs of one but not another of them.

Carstenson (in Waddell, 1976:385) reveals that "less than 1% of the elderly are in wheelchairs", hence the majority of elderly are either ambulatory or semi-ambulatory. Furthermore, over 80% of the elderly who are transportation handicapped can in fact use public transit, although with some difficulty (Wade, 1983).

The mobility capabilities of elderly differ significantly from those of the handicapped population. Members of the early-elderly population are still relatively mobile and independent, preferring to spend time with others like themselves rather than being alone in their homes. Unfortunately, however, many elderly persons reaching 75 years of age and over experience certain physical disabilities which may interfere with their mobility and use of transportation services.

In addition, significant differences exist in trip rates for the elderly as compared to the disabled. The latter sub-group generally demonstrates a much lower level of overall trips. Furthermore, trips to doctors and hospitals are significantly more frequent for the disabled than the elderly (Bailey et al, 1982).

3.1.3. Use of Public Transportation by Elderly and Younger Counterparts

A case study designed to predict future transportation demand by select age groups (Bussiere, 1984) revealed that within the age group of 25 to 54, the automobile usage rate reaches 71.9% and public transportation usage diminishes to 21.1%. After 55 years of age, however, public transit use rises slightly, and in the age group of 65 years and over, it rises to 41.3%, while automobile use falls to 31%. The age group with the highest public transportation trip frequency is the young (20-24 years), with an average of 1.18 trips per day, while the lowest frequency is found in the age group of 65 years and older, with an average of 0.49. Although the trip frequency of public transit for the elderly is low, strong use of public transit is nevertheless detected ie. 41.3% in comparison with 24.9% for total population aged 5 and over.

In the future, the large increase of individuals in the 25 to 54 years age category will considerably raise the demand for automobile-driver trips. This result could have detrimental effects on future public transportation planning decisions and policies for the elderly population since financing allocated to automobile route

improvements will likely outweigh budgets for modifications to existing public transportation systems (Bussiere, 1984).

In addition, Koenig et al (1977) found that although seniors in their later years of retirement were more likely to use a public transit system, they were also more positive in their assessment of it than younger respondents. Seniors not living with a spouse were far more likely than married respondents to use public transportation rather than their own car.

3.1.4. Use of Public Transportation by Elderly Males and Females

A study carried out in Ontario (1985) revealed that elderly women are more frequent users of public transportation than men. This may be partially a result of the fact that many older women in today's elderly generation had never learned to drive, hence they have always relied on their spouse or close friends and relatives for transportation. Since many of these older females do not have a driver's license, they are forced to depend upon existing public transportation services, especially if their spouse is too old to drive on a frequent basis or no longer alive.

The most frequent users of public transportation are widowed and single persons. These elderly persons depend upon public transportation largely because they are in a poor financial position and cannot afford the expenses attached to owning and operating a vehicle (ie. insurance, gas, regular maintenance, etc.).

3.2. Fixed-Route Transit Bus System

The most common form of public transportation is a fixed-route transit bus system. This system consists of buses which run on designated fixed routes throughout a region at specifically determined times of the day. Although the exact routes

travelled and the number of buses on each route per time of day are determined by the expectant demand for such service, the resultant schedule is generally followed regardless of daily demand fluctuations. The most common type of public bus transport serving the largest number of elderly is the conventional 50 passenger bus.

Carstenson (in Waddell, 1976:395) found that over 60% of the elderly sampled use bus services on certain occasions, most often for shopping and visits to doctors or dentists, than for any other trip purpose. Most of these elderly users ride the bus no more than two days per week, and the majority of bus trips taken occur between 11:00 am and 4:00 pm. Many elderly persons prefer using the local public transit system to their own vehicle since it is the bus driver's responsibility to get them to their destination safely. In fact, Golant (in Altman et al, 1984:263) discovered that "bus trips for the elderly are important for their own sake because they provide many old people with pleasurable, spontaneous, and unplanned personal contacts with other elderly and non-elderly passengers".

A study undertaken in Ontario (1985), revealed that 50% of the total sample used public transportation and generally travelled without any assistance. Findings from a study carried out by the Richmond Planning Department revealed only a small number of the elderly surveyed to be bus users. It was estimated, that at most, 25 persons regularly used the bus as a mode of transportation. The reasons cited by elderly not using public transportation were as follows: 69% stated they had no need for it; 13% claimed there was no public transportation in their area; 7% said they were unable to use it; 6% stated they needed personal assistance which they did not have; 4% said it was not conveniently located; and 1% claimed it was too expensive (Richmond Planning Department, 1982).

Although the demand for public transportation by the elderly may be expected to diminish in the future due to the overwhelming predominance of auto transportation, Wade (1983) has noted that in recent years, there has been an increase in the use of

public transit by both ambulatory and disabled seniors.

3.2.1. Functional and Psychological Barriers to Use of Public Transit

Approximately one-third of elderly have vision or movement problems which make riding the bus difficult, while more than a third experience difficulty in moving quickly enough to get on and off buses without problems. Furthermore, over one-third of the elderly are unable to maintain their balance if required to stand while riding on a bus (Carstenson in Waddell, 1976:396).

Other functional problems that the elderly encounter with public transit have been identified at a Conference on Aging at the University of Manitoba in 1985:

Inability to walk to the nearest bus stop, especially in winter; difficulty mounting the steps of regular transit buses and fear of falling when the bus starts; fear of travelling alone, especially at night; and inability to move quickly enough to cross a busy intersection in the interval of a light change.

Many elderly experience problems with public transportation systems because of the design of the buses, with their high steps, high speeds and tight schedules mandated both by commuter needs and operating costs. "Difficulties in getting on and off buses, especially if the bus is away from the curb, no benches or shelters, distances to the bus stops, inadequate schedule information, crowding, standing, poor signs, long waits, transfers, poor driver attitudes, and difficulties in handling shopping bundles are common problems faced by older people using public transit" (Carstenson in Waddell, 1976:379).

A study of the transportation needs of the elderly undertaken in Ontario revealed that for elderly with mobility problems, the distance between home and the nearest bus stop may be a major problem, especially in bad weather. It also noted the importance of shelters with benches ("I cannot stand holding heavy bags...seniors like me who do not own cars would like to see seats put in all shelters..."). The most frequently

identified problem was the height of the first step of the bus. Finally, people commented on the lack of courtesy displayed by drivers ("The drivers often do not pull over to the curb to give the elderly and handicapped that extra ease in departing; sometimes they stop in the middle of the road..."), and the willingness of other passengers to allow people with mobility difficulties to use the reserved seats at the front of the bus.

Most public fixed-route transit systems are designed to achieve a desirable balance between convenience and cost. Financial constraints and the realities of the mass transit market, however, often dictate defining convenience in terms of the job commuting public. In consequence, transit routes are usually focused largely on the downtown, the most convenient area for many commuters but inconvenient for the older person who must transfer, possibly several times, to reach a non-work destination (Wiseman, 1978).

Certain elderly individuals also experience psychological barriers to the use of public transit. They dislike crowded conditions and fear being physically injured while riding the bus as a result of the impatience and inconsiderateness of other passengers.

Although the cost of public transit may be perceived as a major barrier to its use by the elderly, studies have found that exact fare regulations do not cause problems for most elderly. Carstenson (in Waddell, 1977) noted that although 36% of the elderly sampled thought the cost of transportation was too much, 50% did not. Almost 50% of the elderly in his sample spent less than three dollars per week for transportation, yet almost 30% of those who did not use the bus also spent under three dollars per week for transportation. In addition, 40% of the elderly surveyed preferred better service over better buses or lower fares (Carstenson in Waddell, 1976).

Finally, many elderly regard bus travel as safe, relatively inexpensive, and comfortable. If bus stops are conveniently located to their homes and the buses run

on schedule to the places they need to go, these elderly individuals are satisfied with the service.

3.2.2. Problems of Local Public Transit

Studies of the elderly, undertaken in varying regions of British Columbia, have raised significant problems with public transit. The elderly in White Rock complain "that the bus stops are too high for mounting and descending; the bus drivers are impatient and insensitive; buses are too large; and there are not enough buses coming out to White Rock from Vancouver and vice versa, therefore, the bus to Vancouver is often overcrowded to the extent that one must stand for a long time" (Tufts, 1984).

A study undertaken in Vancouver revealed the following concerns regarding public transit: "The drivers never wait long enough for you to get on and off. Some of them have no interest in seniors at all" ; "Bus schedules and bus stops have a lot to be desired" ; "The bus steps are too high for people with poor legs, but I have no choice if I want to get around" (Auger, 1981).

Finally, a study carried out in Richmond, B.C., exposed the following problems encountered by elderly bus users: No bus shelter; have to wait too long for a bus or connection; step into bus is too high; driver doesn't give you time to get seated; too difficult to manage parcels on bus; bus stop too far away; unsafe bus stop; bus route does not take you where you want to go; and, the service is too expensive (Richmond Planning Department, 1982).

3.2.3. Suggested Improvements to Public Transit

A large number of suggestions to the improvement of fixed-route public bus service have been voiced by elderly persons. The elderly in Carstenson's study (in Waddell, 1976) "suggested the elimination of barriers to public transit to include the construction of ramps, shelters, and benches; elimination of steps; altering bus and bus seat designs; adding railings, handholds, and elevators; bringing buses up to the curb for easier access; and providing good service to senior citizens by bus drivers". Forty-five percent of the elderly indicated that shelters at the bus stop would encourage more use of buses and door-to-door service would encourage 50% of the elderly to use buses more often. In general, however, better service and lower fares were the most frequently mentioned improvements required of local transit systems.

Tufts' study (1984), undertaken in White Rock, B.C., revealed the following suggested public transit modifications:

more bus shelters with seats should be provided; since the height of the step into the bus cannot be altered in existing vehicles, special attention should be paid to raising the sidewalk or platform at bus stops in order to reduce the height of the step into the bus; it is important to give bus drivers on-going reminders about the special mobility needs and vulnerability of the elderly; increased awareness and information regarding bus routes and schedules should be provided to the elderly; and local bus should be rerouted so that stops along more streets within the apartment core is possible.

3.3. Demand-Responsive Transit Systems

For many people, and for a wide variety of reasons, neither public transportation nor a private automobile is suitable for everyday use. With the growth of difficult-to-serve suburbia continuing in many parts of the country, and the average age of the population on the rise, the service gap between travel demand and existing transportation systems will undoubtedly widen in the next decade unless alternate, innovative, demand-responsive transportation modes are implemented (Sexton, 1983). The

objective of these special modes of transportation would be to increase the mobility of those groups presently being inadequately served by public transportation and with little or no access to a private vehicle.

Many localities have begun to experiment with a broad spectrum of such unconventional modes of transportation, known collectively as 'paratransit'. Arranged by service characteristics, such modes include 'short-term auto rental' which is closest to the 'automobile' and the 'jitney' which is most like conventional 'fixed-route bus service'. Between these are demand-responsive bus systems often referred to as 'dial-a-ride' transit; an example being the HandyDART custom transit service contracted out to regional operators by B.C. Transit. These transportation modes differ from standard taxi service in that they utilize small vans, or mini-buses, to simultaneously carry several customers with different origins and destinations. Customers do not receive direct service as they do in standard taxi systems (Sexton, 1983).

Demand-Responsive transit systems differ from regular public transit systems in that they possess a 'hands on' characteristic whereby drivers help individuals on and off vehicles and provide flexible and personalized door-to-door service on demand. Most demand-responsive transit systems require advance reservation to allow routing and schedules to be developed in advance of actual service delivery so that one unit can service several people on a particular run. This type of service is cost efficient and quite effective especially in areas that have moderate demand densities since the cost per trip of providing transportation service is not prohibitively expensive and the quality of service provided is generally quite high (Wiseman, 1976).

Features of demand-responsive transit systems that have been identified as desirable are the following: opportunity for self-determination; freedom from imposed limitations; provision for portal-to-portal services; and a transportation mode to accommodate a variety of conditions. Although the cost of this type of public transit service must be within the reach of the elderly, the ability to pay must also be

balanced with individual values, and the ease with which one is able to reconcile the expenditure of funds on transportation to enhance their quality of life (Manitoba Conference, 1985). Even in urban areas that have a variety of public transportation systems, the elderly may require 'hands-on' services, and generally value convenience and accessibility over the cost of the system. The personalized and flexible service characteristics of demand-responsive transit cannot be equalled by existing fixed-route public transportation systems (Revis in Waddell, 1976).

Many demand-responsive transportation systems use the Dodge van or mini-bus which is relatively inexpensive and reports a 5 year life expectation. It can be driven by volunteers or drivers who do not require the same degree of training and skill as the regular transit bus driver. A particular advantage of such mini-buses is that they can get into driveways and narrow areas, so that individuals with mobility problems do not have to walk too far (Revis in Waddell, 1976).

3.3.1. Benefits of Demand-Responsive Transportation Systems

A demand-responsive transportation system is responsive to the demands of its clientele since vehicles are dispatched immediately upon receipt of a request for services. Flexible, portal-to-portal transportation service is beneficial for the elderly in particular, since many dislike, and are often incapable, of walking long distances to bus stops, especially with heavy packages. Such personalized modes of public transportation can be relatively expensive, however, so the cost to the elderly rider with limited transportation resources must be reduced in some manner (Cohen et al, 1980).

In a study by Wiseman (1976) designed to measure the impact of a demand-responsive transportation system on the mobility levels of older people, it was revealed that trip frequencies of people who used such a system were significantly higher than a similar subgroup of the elderly population not using the service. Riders

reported twice as many trips outside the home on a weekly basis, and significantly higher trip frequencies for medical visits, shopping, and personal business than a comparable group of non-users. Although most elderly dislike asking for rides from relatives and/or friends, they perceive demand-responsive public transportation services as extenders of their personal autonomy, self-sufficiency, and mobility.

Cohen et al (1980) have suggested that the benefits of demand-responsive transport systems prove that such transportation should be used to supplement conventional transit systems since they provide a service more closely resembling that of the private automobile. Such a service is designed to respond to the individual users in terms of both trip scheduling and a linking of diffused trip origin and destination points.

3.3.2. Volunteers in Demand-Responsive Transit Systems

Volunteers as escorts and drivers can be valuable supports in making existing demand-responsive transportation systems more effective. In order to attract more volunteers, however, the government should offer them tax benefits.

As Bell (1983) reveals, the four positives of volunteer participation are as follows:

1. Elimination or reduction of essential operating costs in contrast to using paid staff
2. Volunteers represent tangible indicators of community support for the program
3. Volunteering offers an appropriate outlet whereby people can help others
4. Volunteering is a way of retaining one's prior skills and demonstrated continued self-worth.

The negatives of using volunteers, as cited by Bell (1983) are:

1. Reliability - failure to show up at the appointed place and time
2. Flexibility - lack of congruence between the availability of volunteers and requests

for service

3. Retention - dealing with a relatively constant turnover of volunteers; requiring periodic recruitment campaigns to replenish the volunteer pool
4. Competition with paid staff - where tasks were shared

Volunteers can be used within demand-responsive transit systems to perform many different tasks in order to keep operating costs low. They can function as escorts who provide personal assistance to elderly clients; as drivers who use their own vehicles to transport clients in need of individualized service; as dispatchers who receive requests for trips from clients and subsequently match the consumer with the appropriate source of transportation; as record keepers who record the trip requests; or as volunteer coordinators who ensure that the demand-responsive system for the elderly is functioning efficiently and effectively.

3.4. Public Transportation Planning for the Elderly

Since adequate spatial coverage, direct connections, and adequate frequency of service are the central factors to maintaining geographic accessibility for the elderly (Schmitt in Golant, 1979), existing public transportation services must aim to satisfy these requirements. A public transportation service is generally viewed as inefficient if it is inaccessible to its client populations, or it requires excessive resources such as high transportation costs and special bus facilities in order to bring client and service together.

When planning public transportation service delivery to the elderly, one of the most important elements to consider is decreasing personal mobility with increasing age. There are two major assumptions implicit in this view of service planning. First, a certain level of personal support is accepted by society as minimal; those who are physically, mentally, or financially unable to provide for themselves above this minimum

will be supported at least to this level by public services. Second, it is assumed that as an individual becomes older, his physical and mental competence generally decreases. There is a good deal of individual variation in this, because many elderly people are highly competent both physically and mentally. Nevertheless, a larger share of those aged 65 or older are physically or mentally unable to maintain themselves independently than any other age group, except for the very young (Birdsall in Golant, 1979:174).

Transportation planners must change their strategies when it comes to planning public transit services for the elderly. Transportation planners and transit administrators have oriented system planning and system design primarily toward satisfying the travel patterns of an able-bodied constituency, whose travel destinations are largely to work or downtown shopping locations.

Modern transportation planning must give attention to various users with non-work destinations, such as the elderly. These potential riders may have limited incomes, may possess physical limitations and constraints in walking to distant bus stops, or reside in neighborhoods not served or underserved by public transit. It is important that the transportation needs of both the elderly and the general population are being adequately served by existing public transportation systems (Bell et al, 1974:326)

3.4.1. Strategies to Improve Mobility of Elderly

In essence, there are three major strategies by which local geographic accessibility can be maintained for suburban elderly who lack adequate personal mobility resources:

1. Intrinsic changes and/or modifications within existing fixed-route public transit systems can be carried out in order to better serve the needs of the elderly.

Such changes may include increasing the number of route miles and the frequency

of service; making route modifications to reduce the number of transfers needed to complete trips, and modifying stations and vehicles to remove any physical barriers and improve the display of travel information.

2. The establishment of substitute, usually special-purpose systems outside of the regular fixed-route system (i.e. a specialized transit service that is tailor-made to a specific clientele). This service, sometimes referred to as 'subsidiary transit' or 'paratransit', may cover areawide destinations or be tied to a specific facility. Subsidiary transit usually consists of mini-buses, vans, or cars operating on flexible schedules over a variable route system.
3. Reduce the travel requirements of the elderly by insuring that elderly persons are located either within walking distance of the nearest bus stop or close to their desired destinations (Schmitt in Golant, 1979; Bell et al, 1974).

3.4.2. Strategy One

Theoretically, it would be possible for transit authorities to provide more transit bus service on fixed-routes in low-density areas. Public transit authorities, however, are hesitant to supply more fixed-route service in low-density suburban markets because they claim that the high capital and operational costs they must incur to extend present transit bus systems in such areas would be too costly due to low demand. Consequently, many suburban elderly find themselves poorly served by existing public transit systems (Wachs, 1978).

Although in certain neighborhoods with large numbers of elderly where travel demand is high, a conventional fixed-route bus system may be both effective and highly cost efficient, the extension and/or modification of fixed-route buses into new suburban low-density areas is costly, largely because the amount of labour expended is great and the demand for such services is low. In a study conducted for the Urban Mass Transportation Administration, the Regional Plan Association of New York estimated that

"local bus transit was economically feasible only in areas having population densities in excess of 15 dwelling units (between 30 and 40 persons) per gross acre, and that dial-a-bus (i.e. demand-responsive transit service) required about five dwelling units (10 to 15 persons) per acre" (Wachs, 1979:15). The trend toward lower density living by senior citizens presents some significant difficulties for those who hope to meet the transportation needs of the elderly predominantly through fixed-route public modes of transport (Wachs, 1979).

Although certain elderly suburban residents depend on transit for their mobility, the dispersed population of the suburbs is too few to support a transit system extensive enough to provide anything approaching the mobility that central-city residents have (Koutsopoulos, 1976).

3.4.3. Strategy Two

A comprehensive analysis of the elderly and their transportation needs carried out by Wade (1983), revealed that the elderly residing in suburban areas of Canada are growing in large numbers and increasingly becoming transportation-isolated. In his final report, Wade (1983:53) specifically states that "the important factor in alleviating the transportation isolation of these seniors is the use of cost-effective demand-responsive paratransit services". In order for these services to be cost-efficient, however, it would be necessary to employ some cost-effective measures, such as fuel-efficient vehicles, computerized control systems, and possibly the use of volunteer drivers.

Since the residential density of most suburban areas is relatively low, modifications to existing fixed-route transit systems in order to satisfy the transportation needs of the elderly would be too costly. In consequence, demand-responsive transit systems would be more efficient. As Wiseman (1978:34) states:

In settings where older people are (residentially) dispersed, a demand-responsive system might be best and less expensive, because

fixed-route, regularly scheduled systems may have high overhead costs. In areas with very light demand densities, such as rural areas, a modified dial-a-ride system that provides services on a less-than-daily basis might be best.

An important objective of demand-responsive transit services is to improve internal cost effectiveness since the levels of government are diminishing their ability to support such necessary expenditures. Cost-effective implementations may include such elements as computerized paratransit services. The advent of the micro-computer presents opportunities for cost and operational efficiencies in the use of computer programs for control and optimization of paratransit services. Another cost-reducing measure would involve training a number of volunteer drivers and providing travel information centres to seniors in local suburban community centers and other popular destinations frequently populated by the elderly of the region (Wade,1983).

Furthermore, Wachs (1979) claims that paratransit demand-responsive systems in the suburbs would be more cost-efficient if they served a larger clientele rather than just transportation-isolated suburban elderly. A demand-responsive service could potentially serve other transit-captive groups such as mothers with young children and the handicapped. With a larger transit market, a demand-responsive transit system would be more likely to survive in a suburban environment since the operation would receive more revenue due to greater demand. Demand-responsive transit systems which restrict themselves to fulfilling only the transportation needs of suburban elderly would have a greater possibility of failing since demand in suburban areas is generally not large enough to compensate for the services expended in the region.

3.4.4. Strategy Three

The final strategy aimed to improve the mobility of the elderly within suburban environments is to relocate elderly residents closer to essential community services and/or fixed-route major bus stations. This strategy would be feasible only in the long term

since it is difficult, if not virtually impossible, to relocate already-settled elderly residents from one area of a suburb to another. In the longrun, however, elderly people moving into the suburban area can be advised to relocate within the optimal residential locations in terms of proximity to available transportation services and facilities. In the end, however, it is up to the discretion of the elderly individuals themselves to decide where they wish to move within the suburban area.

3.4.5. Recommended Solution

Koltin (1979) undertook an extensive study in Harrisburg, Philadelphia designed to determine whether a demand-responsive van service satisfied the special transportation needs of the elderly better than the existing public transportation bus. She identified variables of concern to the elderly when they travel and determined weights for each of them. Using this data, the existing bus and van service were evaluated. Research findings revealed that the demand-responsive van service accommodated the needs of the elderly better than the public transportation bus system. Ideally, therefore, a demand-responsive transit service would best satisfy the unique transportation needs of elderly suburban residents.

Bell et al (1974) have wisely suggested, however, that the best transportation solution for suburban transportation-isolated elderly is the existence of both a fixed-route transit system along with a specialized demand-responsive system catering to the transport needs of the elderly. This way, the transportation needs of both the elderly and other members of the suburban population would be satisfied. Unfortunately, however, this solution is likely not to be accepted by local governments. As Tufts (1984) discovered in his own research on the elderly, when the elderly of White Rock complained of inadequate public transportation to and from Vancouver, the local planner responded that "The transit frankly has told us that they have an intention to discourage bus ridership. They have a fixed budget and they want nobody else on the

buses". Furthermore, with regard to the possibility of having 'kneeling buses', smaller sized buses, or dial-a-bus within White Rock, the planner stated that these decisions were a provincial matter. "The provincial government has said that these changes in bus transportation are, thus far, not required" (Tufts, 1984:82).

CHAPTER FOUR

THE STUDY AREA: RICHMOND, B.C.

4.1. Introduction

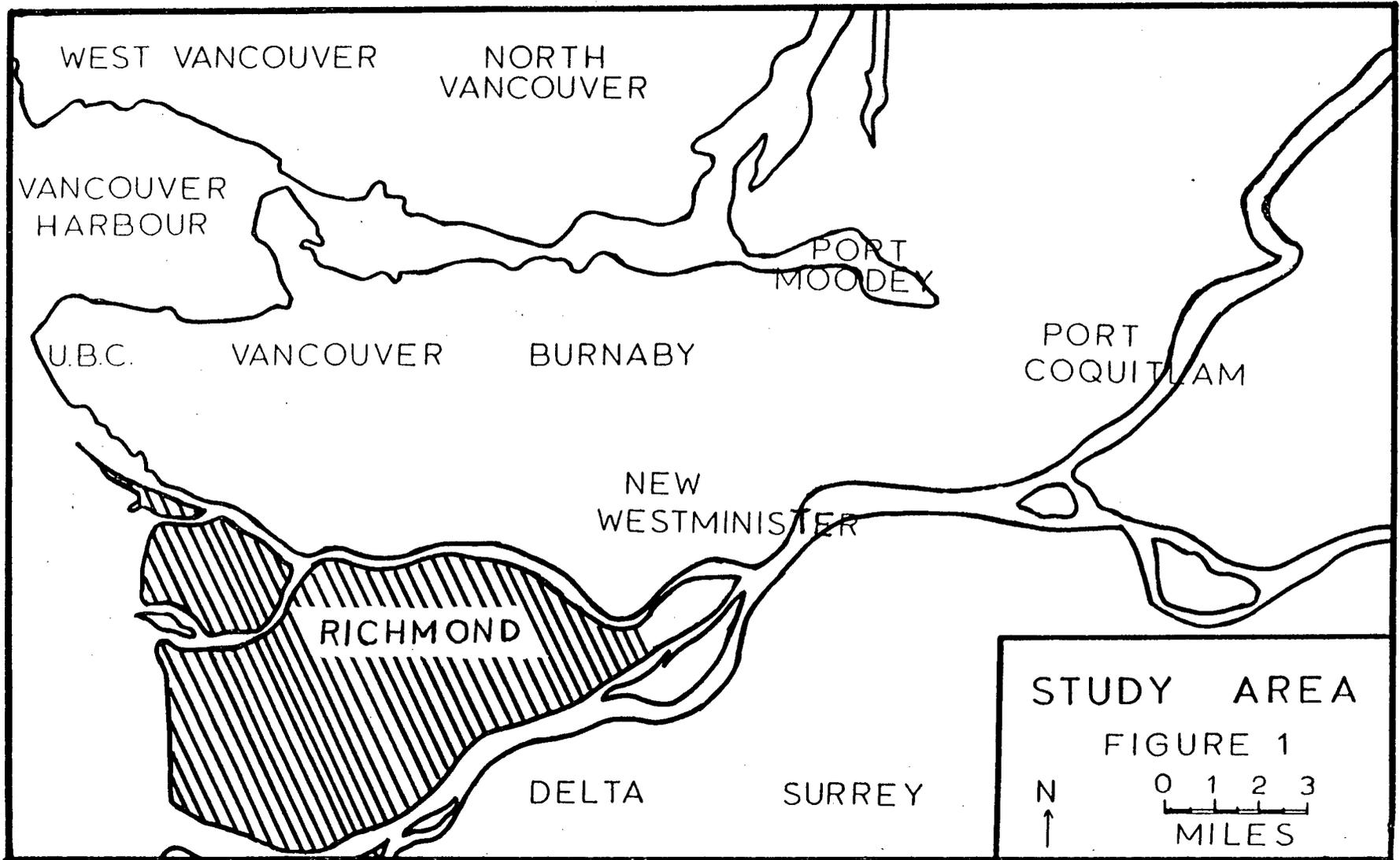
This chapter presents a description of the physical characteristics, elderly demographic profile, and existing public transportation alternatives within Richmond, B.C. In order to gain a clear understanding of the unique transportation requirements and public transit expectations of Richmond's independent-living elderly, knowledge of the demographics of the suburb's elderly residents and the transportation systems available to them is essential. After all, it is the existence and availability of these specific transport systems which inevitably influence the daily mobility of Richmond's elderly residents.

4.2 Physical Characteristics of Richmond

The Municipality of Richmond is situated south of Vancouver between the north and south arms of the Fraser River. Richmond is the fourth largest municipality in the Greater Vancouver Regional District with a total land area of 41,529 acres (refer to Figure 1). When Richmond was incorporated in 1879, the region, primarily a farming and fishing-based community, consisted of thirty families living on Sea and Lulu Islands. In 1986, the population of the municipality was estimated to be 108,490. Since its incorporation, Richmond has developed into a vibrant and active suburban community.

The development of new transportation modes, routes, and connections within Richmond have been the primary determinants of the suburb's residential location and growth rates. Most residential development has occurred in west Richmond as the result

FIGURE 1



of a 1960 Planning Department report which specifically recommended residential development be restricted to the west side of the freeway (Richmond Planning Department, 1986).

Richmond can be divided into three major areas: West Richmond (including the Town Centre), East Richmond and Sea Island. The Town Centre within West Richmond is bounded by Blundell Road (south), Fraser River (north), Gilbert Road (west), and Sea Island and Garden City Road (east). This Town Centre is the focus of commercial activities and social contact for the suburban community. As the "Downtown District", the Town Centre encompasses a variety of land uses: light industry, low-density, single-family dwellings; medium-density, townhouse dwellings; high-density, apartment dwellings; retail shops and malls; offices; service commercial businesses; public institutions; and social, cultural and recreational amenities. It includes the Municipality's business core along with a significant amount of commercial retail establishments. This region is the largest single-family residential area of the municipality and the area in which many of Richmond's independent-living elderly reside.

East Richmond, bounded by the South Arm Fraser River (south), North Arm Fraser River (north), Highway 499 (west), and Hamilton (east) consists primarily of agricultural and industrial land-uses with little, yet increasing, residential development. The Sea Island area of Richmond is the location of the Vancouver International Airport, along with related businesses and residential areas.

There are many community services available to the residents of Richmond. Some include the Landsdown shopping mall, Minoru Arts & Library Centre, Minoru Aquatic Center, and the Richmond Golf and Tennis Club. In summary, Richmond's unique physical characteristics plus its variety of amenities make the suburb a desirable place to live.

4.3. Elderly Demographic Profile of Richmond

The relative numbers of those over age 65 in British Columbia is higher than the national average. In 1976, 9.8% of the provincial population was 65 years of age and older (as compared to 8% in Canada) and projections suggest that this ratio could rise as high as 11.5% by 2001 (Statistics Canada 1979). Demographic figures indicate that a significant number of older people in the province live within the Greater Vancouver Regional District. "In fact, almost half (45.9%) of B.C.'s seniors live in [this regional district]; 21.2% in the City of Vancouver" (Gutman et al, 1986). (see Table 3)

The population of the suburban Municipality of Richmond has increased significantly over the last 25 years, from 50,460 in 1966 to 108,492 in 1986. "The majority of Richmond's population is in the 25 - 44 age group, however, there are an increasing number of seniors (65 years and over) and middle-aged adults (45-64 years) in the municipality" (Richmond Planning Department, 1985: Paper #26). Between the years 1961 to 1981, the proportion of elderly people in Richmond grew substantially from 4.9% to 7.4% of the total population; a reflection of this age group's high growth rate and tendency to "age-in-place". The number of senior citizens age 65 and over is expected to increase continuously over the next 15 years. This increase will be greater for elderly women than men and by the year 2001, there will be nearly 50% more elderly women than men in Richmond. This large increase in the number of elderly women will be particularly evident in the 80 year old and over category (Richmond Planning Department, 1986). The impact of demographic change towards an older population in Richmond will be cumulative and more noticeable beyond 1988 when projections indicate that the 65 years and older group will comprise one in ten Richmondites (Richmond Planning Department, 1982). A breakdown of Richmond's 1981 and 1986 elderly population by age and sex is found in Table 4.

TABLE 3TOTAL POPULATION AND POPULATION AGED 65+: GVRD, 1981

Communities/ Electoral Areas*	Total Pop- ulation	Population			Distribu- tion of Pop. 65+ in GVRD	Percent- age of Pop. 65+
		Aged 65+	Total	Males		
Belcarra	425	25	15	10	0.1	5.9
Burnaby	136,500	16,555	6,750	9,805	12.1	12.1
Coquitlam	61,085	4,330	1,855	2,475	3.2	7.1
Delta	74,775	4,500	1,980	2,520	3.3	6.0
Lions Bay	1,075	35	20	15	0.1	3.3
New Westminster	38,555	6,960	2,630	4,330	5.1	18.1
North Van. City	34,270	4,315	1,615	2,700	3.1	12.6
North Van. Dist.	66,635	4,605	1,890	2,715	3.4	6.9
Port Coquitlam	27,530	1,385	625	760	1.0	5.0
Port Moody	14,920	595	255	340	0.4	4.0
Richmond	96,155	7,110	3,080	4,030	5.2	7.4
Surrey	147,325	12,205	5,695	6,510	8.9	8.3
Vancouver	415,555	63,305	25,950	37,355	46.2	15.2
West Vancouver	35,730	5,570	2,140	3,430	4.1	15.6
White Rock	13,550	4,725	1,900	2,825	3.5	34.9
Electoral Areas:	5,755	880	345	535	0.6	15.3
Total:	1,169,840	137,105	56,745	80,355	100.0	11.7

*Statistics Canada. 1981 Census. Population, Occupied Private Dwellings, Private Households, Census Families in Private Households - British Columbia, Catalogue 93-922 (Vol. 2 - Prov. Series), Table 2, December, 1982.
Source: Gloria Gutman et al (August, 1986), Fact Book on Aging in British Columbia, Gerontology Research Centre, Simon Fraser University, Burnaby, B.C.

TABLE 4
ELDERLY POPULATION OF RICHMOND
(65 Years and Older)

	1981	1986
MALE		
65-74 Years	2,205	2,940
75+ Years	870	1,245
Total Pop.:	47,555	53,155
FEMALE		
65-74 Years	2,645	3,580
75+ Years	1,385	2,110
Total Pop.:	48,600	55,335

*Statistics Canada Census (1981 & 1986)

4.4. Transportation Alternatives of Richmond's Elderly

4.4.1. The Automobile

Roads consume over twenty percent of the land area of the urban part of Richmond, not including the land area consumed for automobile parking. Automobile transportation creates an enormous demand for land within Richmond; both directly in the form of roads and parking space, and indirectly in the low-density, land-extensive development automobile use necessitates. In comparison to the Greater Vancouver Regional District, Richmond has a higher proportion of auto registrations per household (1.8 vs. the GVRD average 1.6) and a greater proportion of commuter-insured autos (38.3% vs. the GVRD average 34.5%) (Richmond Planning Department, 1985: Paper #22). Automobiles are heavily relied upon as a mode of transportation in Richmond because of the municipality's low-density neighborhoods. In particular, a significant number of Richmond's elderly own their own vehicles. A survey by the Richmond Planning Department (1982) reported that 87.5% of the elderly homeowners surveyed owned a car.

4.4.2. Regular Bus Transit

Transit service in Richmond is provided under the provincial organization, B.C. Transit, which oversees all aspects of transit transportation in Greater Vancouver, including the planning and design of transit facilities. In Richmond, the transit system consists exclusively of 10-15 year-old diesel buses. The buses presently used are 40 feet long and capable of carrying 80 passengers (50 seated individuals and 30 standees). In the future, B.C. Transit is looking at using articulated buses on the express corridor between Richmond and Vancouver. These buses are more efficient in that they are 60 feet long and can carry 75 seated passengers with over 100 standing capacity.

The transit system within Richmond operates on a "Time Transfer Focal-Point System" in which all local east-west bus routes are focused on the Town Centre express corridor (refer to Appendix E). There are eleven bus routes which criss-cross Richmond west of Number Five Road. All of the routes pass through the Town Centre using either Number Three Road or Garden City Way. Transfers between routes take place at Cook Road and Number Three Road. Bus routes make effective use of arterial roads, providing most residential areas in the urban part of Richmond with a bus stop within one quarter mile of each residence (Richmond Planning Department, 1985: Paper #22). During rush hour, there is an express bus running down the Number Three Road express corridor between downtown Vancouver and Richmond every 3-4 minutes, and every 20 minutes on Sundays. Currently, there are 25 buses running locally, 30 on express, and 55 during daily rush hours.

The frequency of service on Richmond bus routes is geared to the time of day. Rush hour service on any one route is generally 15 minutes with, on average, half-hour intervals on most routes during the mid-day. In the evenings, bus service is cut back to an hourly service schedule.

The Vancouver Regional Transit System, of which Richmond is a part, provides concession fares to the elderly. A pharmacare card, required as proof of senior citizen status, allows the elderly individual to ride a bus within one zone for 65 cents as opposed to the \$1.25 charged for an adult.

The elderly are ensured of at least 4 courtesy seats at the front of each bus. In addition to these reserved seats, between the years 1984 to 1986, B.C. Transit changed all bus destination signs to make them easier to read from a distance. Rather than the original white, upper-case lettering, all head signs on top of buses have been changed to upper and lower case, black and yellow lettering. The amount of information has also been condensed and the letters themselves have been enlarged in an effort to simplify the destinations.

Although Richmond's transit system may appear quite efficient, there is a growing dissatisfaction with the service. Many of the problems are associated with a short supply of buses. Often, bus-users, including the elderly, find only standing room during rush hours when peak loads are carried, and the waiting time for buses is increasingly becoming a problem. Bus patrons are left standing at bus stops more often as crowded buses pass them by.

From a land-use planning perspective, the expansiveness of low-density single-family residential areas and sprawling shopping malls do not provide adequate concentrations of origins and destinations to make transit economically viable. Richmond, by itself, has neither the absolute number of transit patrons, nor the relative concentration of bus-users to justify even the most conventional of rail transit systems. Any transit transportation strategy must necessarily be supported by a land-use strategy which increases densities in order to concentrate origins and destinations. Over the long-run, however, increased densities will create sufficient demand for transit and, conversely, increased transit capacity will create a demand for higher densities in proximity to transit service (Richmond Planning Department, 1985: Paper #22, p. 19).

4.4.3. HandyDART Custom Transit Service

Throughout the GVRD, and most recently in Langley, B.C. Transit administers a custom transit service known as HandyDART for those unable to use conventional transit. In Richmond, B.C. Transit contracts this service out to the Vancouver Home Support Society. Both parties negotiate the budget for level of service and sign an annual operating agreement. On average, the cost of HandyDART service for the total GVRD region is as follows:

- Ninety Percent is subsidized =
 - 64% - contribution by province
 - 26% - contribution by municipalities (ie. 3 sources of taxation:
 - a) surcharge on HydroBill (for regular transit approx. \$1.60/month)
 - b) gas tax on all gas sold in service area (2.5 cents/litre)
 - c) non-residential property tax
- 10% - targeted user fares (targeted to recover)

Eligibility for HandyDART use is much broader in British Columbia than in other provinces. If an individual is unable to use the conventional bus system for any reason, he/she is eligible to use HandyDART. Specific eligibility requirements for the service, however, are laid out as follows:

IV. Custom Transit Services

16. (1) The following groups are designated as eligible for custom transit services:

- (a) handicapped persons as defined under the Guaranteed Available Income for Need Regulations,
 - (b) a recipient under the Blind Persons' Allowances Act, or
 - (c) persons who
 - (i) have a disability, either permanent or temporary, confirmed by a medical practitioner, that is sufficiently severe that the person is physically unable without assistance, to use a public passenger transportation service, and
 - (ii) have been issued an identification certificate by the authority.
- (2) The authority shall issue an identification certificate to persons who are confirmed under subsection (1) (c) (i).

Although there is no specific age requirement for the service, it is frequently used by the elderly. Individuals who appear to have no mobility problems, however, may be required to fill out an "Eligibility Verification Form" (see Appendix A) by their doctor before requesting the service.

The HandyDART transit system is a door-to-door service, whose administration staff require a minimum of 24 hours notice and up to 7 days for medical trips. Priority is given to work, medical, and post secondary education trip purposes; all other trip purposes are classified as secondary in importance.

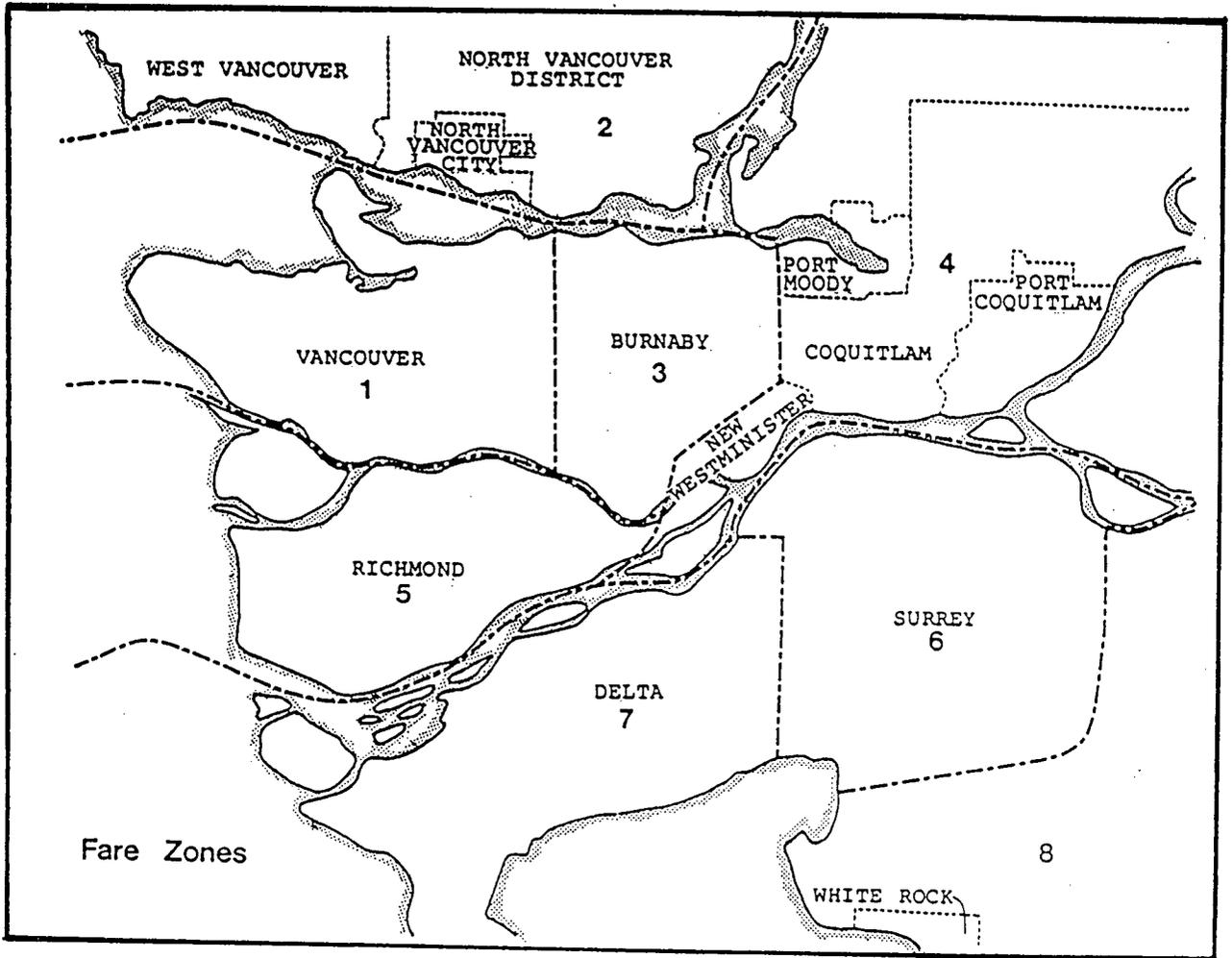
Since April 1984, the cost of HandyDART service has been as follows:

1. \$1.25 - within one zone
2. \$1.25 - between two directly adjacent zones
3. \$1.75 - between three directly adjacent zones
4. \$2.25 - between four or more directly adjacent zones (refer to Figure 2)

The Richmond fleet of HandyDART buses consists of six buses, five of which are wheelchair equipped. The HandyDART service operates 6 days a week, Monday through Saturday, from 5:30 am to 6 pm. There is no service on Sundays. Staff requires at least 24 hours notice for a trip and up to 48 hours, if possible, for a trip into Vancouver. Most trips are for medical or work-related purposes and it is up to the administrator to decide whether someone is or is not eligible for the service. As one of the Richmond HandyDART administrators, Sheila Shwab claims, "if the steps on a regular bus are too high for someone or if they're really paranoid, they can use HandyDART. Some people, however, do abuse us".

In addition, Richmond HandyDART also has a supplementary agreement with a taxi cab company in Richmond which offers service up to a certain budgetary limit to satisfy any excess demand. The taxi company charges users HandyDART rates and is subsequently subsidized by B.C. Transit. Unfortunately, however, these cabs do not

FIGURE 2



have wheelchair accommodation.

HandyDART relies primarily on word-of-mouth for its advertising. As one of the administrators, Sheila Schwab states, "We don't advertise because we're just meeting demand now. With more vehicles [ie. at least 2 more for now] and more hours allocated for drivers [presently, drivers are only allocated a certain number of hours per month], we'd be better able to satisfy more demand, and therefore, we could afford to be less picky where customers are concerned". In a survey of the Richmond elderly carried out by the Richmond Planning Department (1982), it was revealed that although all of the elderly surveyed were aware of the HandyDART system, they believed that it was provided only for medical and health-related appointments.

Evidently, usage of the HandyDART service has increased dramatically since its inception. Passenger trips have almost doubled over the last five year period. Unmet demand for service is estimated at 3 percent of total travel. B.C. Transit estimates an annual increase in trips at about 2 percent. With an increasing proportion of elderly within the Richmond population, especially those over 80 years of age, the demand for HandyDART service will likely increase even more in the future.

4.4.4. Richmond Community Leisure Transportation

Community Leisure Transportation in Richmond operates three buses for use by Richmond based non-profit community groups:

1. A 14 passenger mini-bus with a wheelchair lift
2. A 15 passenger mini-bus
3. A 48 passenger Blue-Bird bus

This service is operated to make Leisure Service programs more accessible to adults with special needs, such as the elderly and youth, and to promote leisure opportunities for all Richmond residents. The service consists of three user-group

classifications:

1. Group 1 - Richmond seniors and other special needs citizens wishing to attend leisure programs sponsored by the Department of Leisure Services or affiliated groups.
2. Group 2 - Richmond groups and programs affiliated with the Department of Leisure Services.
3. Group 3 - Other Richmond non-profit groups with the intent and purpose of providing leisure opportunities for Richmond residents

All groups using the service are expected to contribute a set amount for the use of the buses which contributes partly to the cost of operating and maintaining the buses. Each bus also charges a straight mileage rate per kilometer outside of the GVRD and a minimum charge within Richmond.

This bus service is often used by groups of Richmond elderly planning recreational or shopping-related outings. Most buses, however, require a minimum of seven passengers for booking.

CHAPTER FIVE

SURVEY METHODOLOGY AND RESULTS

5.1. Survey Methodology

5.1.1. Nature of Survey

An exploratory survey of Richmond's independent-living elderly through a self-administered questionnaire (see Appendix B) comprised the main research task of this thesis. The objective of this survey was to gain familiarity with the views and concerns of some of Richmond's independent-living elderly on their travel habits and reliance upon public transport in order to test the underlying hypothesis of the thesis - "although many suburban non-institutionalized elderly may own their own cars, they would prefer to use public transit, particularly demand-responsive public transit, provided it satisfied their travel requirements and public transport expectations. This exploratory survey was designed to reveal the general travel habits and public transportation difficulties and concerns of the sample rather than to gather scientifically objective data. Since the sampling was not undertaken randomly, the resultant non-probability sample of this survey cannot be regarded as representative of the larger Richmond independent-living elderly population. Consequently, statistical techniques employed to project the sample results into a confidence level for the population parameter of interest are not applicable. The information revealed in this survey, therefore, represents only the opinions and concerns of a select group of eighty-five Richmond independent-living elderly.

5.1.2 Sources of Contact

Initially, Jackie Schell, programmer at the Richmond Minoru Seniors Society, was contacted and informed of the nature of this thesis and the specific intention of the survey. Ms. Schell subsequently supplied the researcher with a list of community groups and various associations within Richmond concerned with the elderly. These groups included: a seniors' church group; two senior centres; a South Arm Senior Branch #59; an O.A.P Branch #39; a Ukranian Seniors Club and a number of senior residences. Since the survey was designed to concentrate only upon independent-living elderly within Richmond, the senior residences listed were immediately excluded as potential sample material because they could not be classified as independent-living arrangements. The administrators of all remaining organizations were contacted by telephone and informed of the nature of the study. They were subsequently asked whether any members of their particular group would be interested in completing a questionnaire as a means of voicing their concerns in regards to their travel habits, and existing transportation alternatives within Richmond. All individuals contacted were very interested in the project, and many attempted to arrange a time during which the questionnaire could be administered to a large number of the groups' members at one time. Financial and time constraints, however, dictated that certain groups, predominantly those largely inactive during the summer months, had to be discarded.

5.1.3. Instrument

A questionnaire (see Appendix B) was developed to elicit information on seven main areas:

1. Nature of current travel habits (including frequency of travel; modes of transportation used; location of trips; times of the day trips are made; and use of alternate transport modes)
2. Nature of difficulties encountered in getting to where one wants to go

3. Auto availability and use
4. Use of Public transit (including frequency and time of use, difficulties encountered, and suggested improvements to existing system)
5. Use and awareness of HandyDART custom transit
6. Importance of several public transportation characteristics and attributes
7. Demographic profile of the sample (including age, sex, marital and financial status, living arrangements, and place of residence)

The rationale for choosing the self-administered questionnaire as the research apparatus for this thesis is based on the following reasons:

1. Through initial contacts with select senior group representatives, it became apparent that in at least two cases, a large number of seniors could be approached at one time. Since this opportunity presented itself, the survey technique selected had to be designed in such a way as to acquire the necessary information from as many independent-living seniors as possible within a limited amount of time.
2. A self-administered questionnaire allows for a lower degree of response error since there is no interviewer with whom the respondent must interact.
3. A self-administered questionnaire allows the respondent to more carefully formulate and record his or her responses at a pace that is more leisurely and free from distractions (Weiers, 1984)

5.1.4. Subjects and Setting

Information from eighty-five elderly subjects (60 years of age or older) were acquired from two senior centres and a church group in Richmond, B.C. Specifically, forty of the survey responses were obtained from elderly members of the Richmond Senior Centre, twenty-six were obtained from the Minoru Seniors Society, and nineteen from the Fraserview Senior Church Group in Richmond.

The Richmond Senior Centre elderly were approached during an end-of-the-month "pot-luck" lunch. The researcher explained the purpose and intention of the study to the whole group, ensuring that all participants were made aware of the questionnaire's confidentiality and their right to refuse to answer any of the questions. Subsequently, the self-administered questionnaires were distributed to everyone in the room. Half an hour later, all completed questionnaires were picked up.

Prior to the start of implementing the survey at the Richmond Minoru Seniors Centre, contact was made with the programmer of the centre, Jackie Schell, to explain the study's procedure and obtain permission to interview. Responses from the elderly members of the Richmond Minoru Seniors' Centre were acquired on two full days of interviews at the centre. The seniors at this location were made aware of the researcher's presence and intended objective through a large poster explaining the study's purpose put up in the lounge of the centre a week prior to the scheduled interviews. Most of the senior participants filled out their own questionnaire, while some completed it in conjunction with the researcher.

Finally, the Fraserview Senior Church Group was informed of the study's purpose at a group meeting during which the self-administered questionnaires were distributed. Any questions that the seniors may have had regarding the general nature of the questionnaire or the intention of specific questions were answered at this time. Each of the participants was supplied with the researcher's telephone number in case any problems or questions arose. Subsequently, the questionnaires were filled out at home and picked up at the church office a week later.

5.1.5. Sample Selection

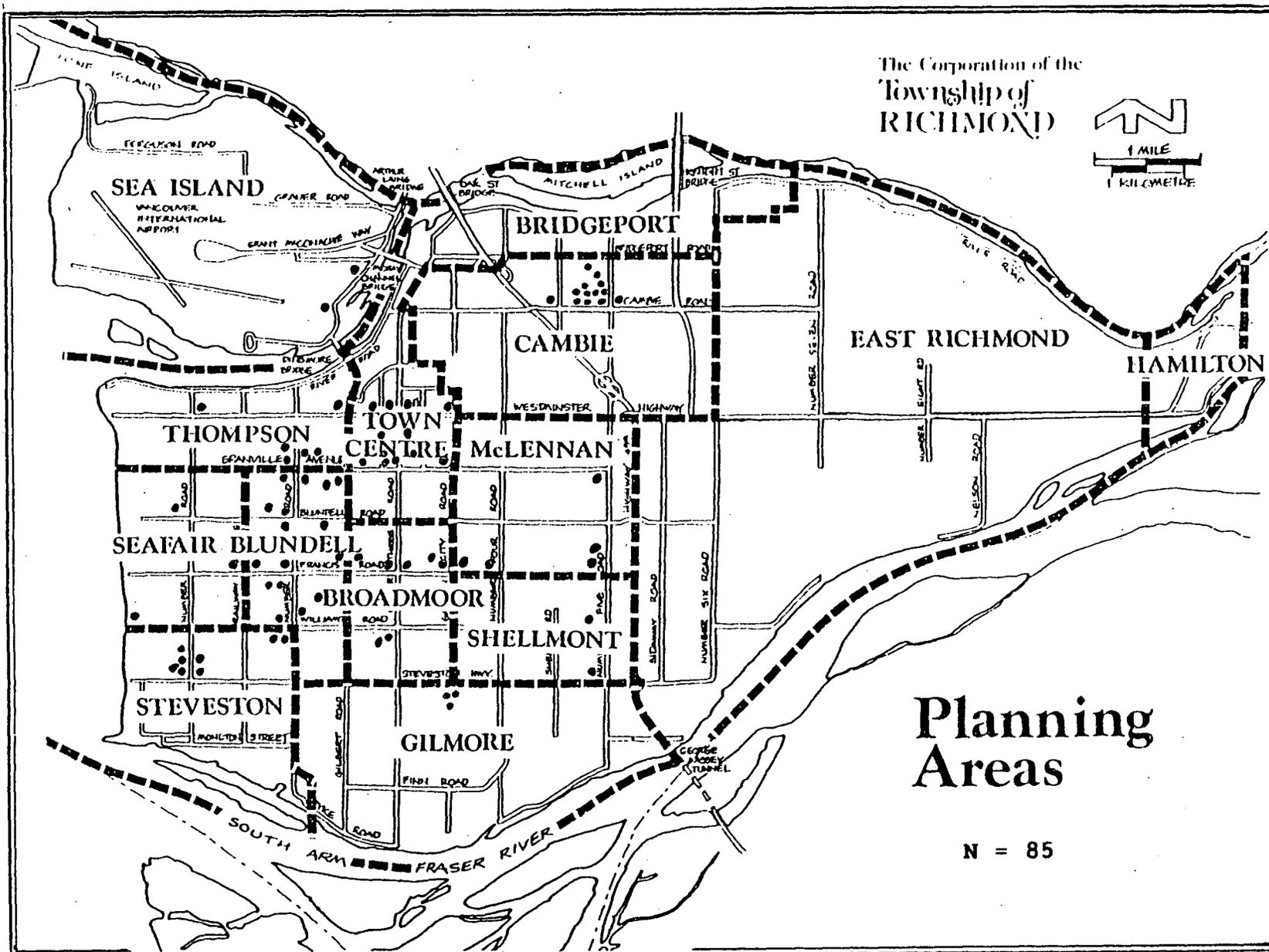
The main criterion in sample selection was convenience rather than comprehensiveness or stratification. Since the intent in selecting the sample was to obtain only independent-living senior respondents, housing type or tenure were inconsequential except in the process of establishing a profile of the respondents. Elderly living independently throughout the municipality of Richmond were abundant in the various senior groups approached, most likely since "less than 20% of those over age 65 in Richmond live in seniors' housing projects" (Richmond Planning Department, 1982). The few questionnaires completed by elderly respondents residing in strictly institutional settings were discarded for the purposes of the study.

Although, as previously mentioned, a statistically representative sample of Richmond's non-institutionalized elderly residents was not sought after in the design of the study, final results reveal that a fairly residentially-dispersed sample of West Richmond's elderly was nevertheless obtained through the process of approaching seniors at three different and geographically separate locations (see Figure 3).

5.2. Results of Survey

This section presents the results of the findings from the eighty-five completed self-administered questionnaires with elderly Richmond independent-living residents. The information gathered will be summarized under five sub-sections: (1) Demographic Profile of the Sample; (2) Travel Characteristics; (3) Auto Availability and Use; (4) Use of Existing Public Transportation Systems; and (5) Importance of Public Transportation Characteristics.

FIGURE 3



No Response = 8

5.3. Demographic Profile of the Sample

5.3.1. Age of Respondents

As Figure 4 reveals, the total sample consists of a large proportion of respondents between the age of 60-75 years with 42.4% of the sample falling into this age category. Members of the age categories of 60-64 years and the 85+ years are relatively underrepresented in this sample with 8.2% and 4.7% respectively. The underrepresentation of these two groups may be attributed to the fact that elderly aged 85 years and over tend to be less active and mobile, and thus are less likely to visit senior centres on a frequent basis, while 60-64 year old elderly may feel that they are still too young to attend. Since most of the participants were approached at a senior centre, seniors within these age categories, therefore, would naturally be underrepresented. Seventy-eight percent of the respondents sampled are below the age of 80. The eldest respondent sampled was 86 years old while the youngest was 60 years old.

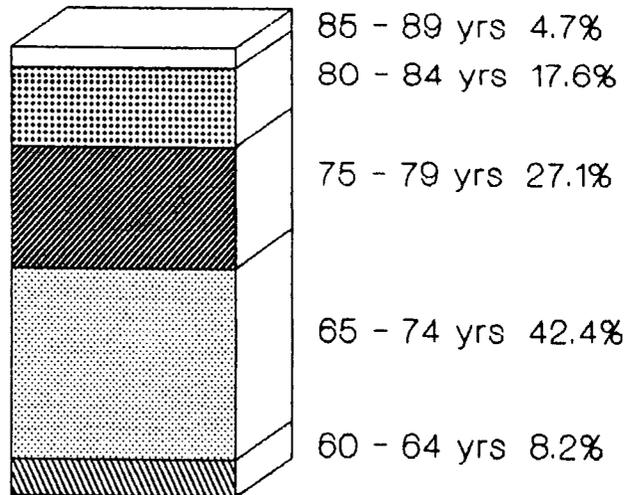
5.3.2 Sex of Respondents

Based on the finding that "in 1976 in Richmond, males comprised 44% of the population over 65 years and females comprised 56%" (Richmond Planning Department, 1982), the results of this study reveal relatively similar proportions. The proportion of female respondents surveyed is 61.2%, while the male respondent proportion is 38.8% (see Figure 5).

FIGURE 4

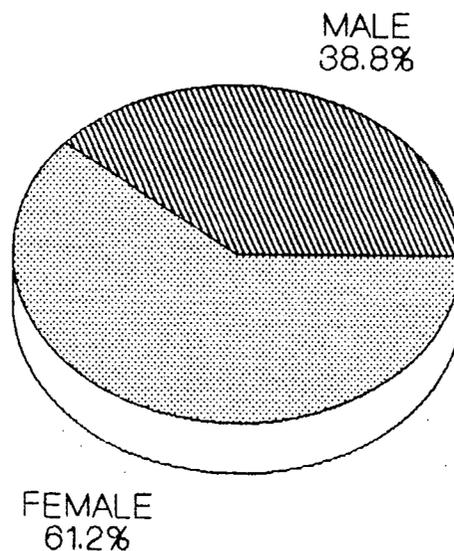
AGE OF RESPONDENTS

(N = 85)

FIGURE 5

SEX OF RESPONDENTS

(N = 85)



5.3.3. Living Arrangements of Respondents

Sixty percent of the respondents are married while 40% live alone (see Figure 6). A further break-down reveals that 87.9% of the men surveyed are married and living with their spouse, while only 42.3% of the women are married and 57.7% live alone (see Figure 7). These proportions reflect the greater male mortality rate and the large number of elderly widows. The predominance of women respondents within studies carried out on the elderly is a fairly common and thus expected occurrence.

5.3.4. Place of Residence of Respondents

Figure 8 reveals that more than a third of the elderly sampled live in their own homes (38.8%). The next largest number of elderly respondents live either in a rented apartment or a condominium (24.7% and 21.2% respectively). As Figure 8 illustrates, 4.7% of the sample live in senior housing. These individuals were included in the sample only after ensuring that their living arrangements could not be classified as institutional settings. These individuals were essentially living independently in partially rent-subsidized walk-up apartments.

As figure 9 illustrates, the length of residence at one's present address given by the respondents is relatively evenly dispersed. The largest number of respondents (22.4%) revealed their length of residence in Richmond to be between 10 to 20 years, while only 10.6% claimed to be living in Richmond for less than a full year. Sixty-two percent of the 85 respondents have lived at their present address for more than 4 years with 18.8% of these individuals classified as long-term residents of over 20 years. These proportions indicate that there is a significant group of Richmond residents who have raised their families in the municipality and have decided to retire in the suburb. Furthermore, there is a constant number of elderly moving into

FIGURE 6

LIVING ARRANGEMENTS OF RESPONDENTS

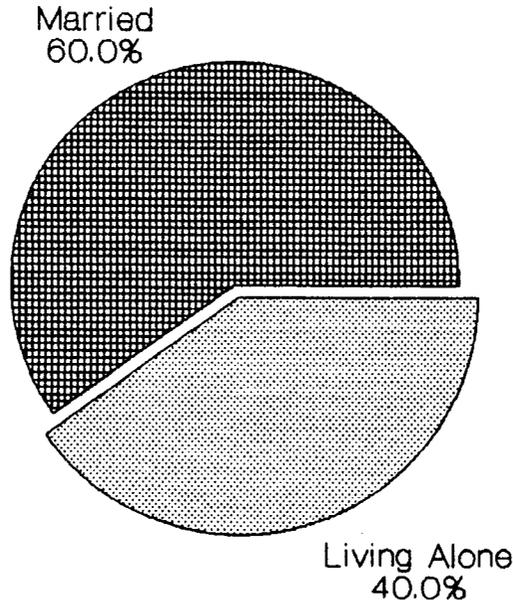


FIGURE 7

SEX DISTRIBUTION BY LIVING ARRANGEMENT

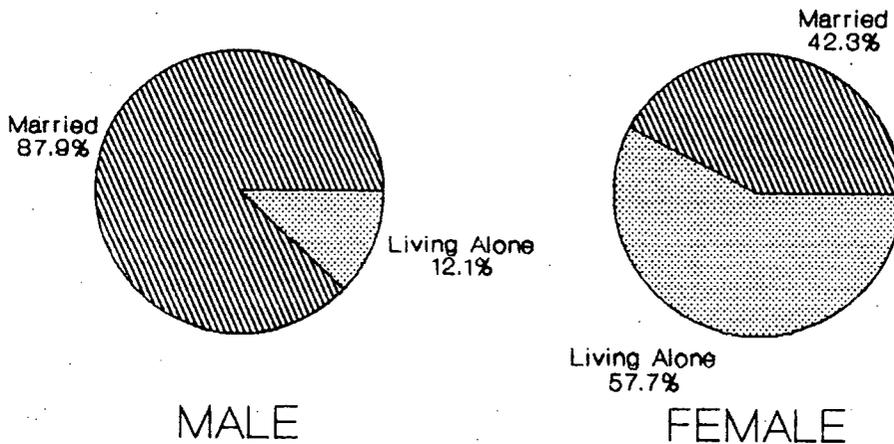


FIGURE 8

TYPE OF ACCOMMODATION OF RESPONDENTS

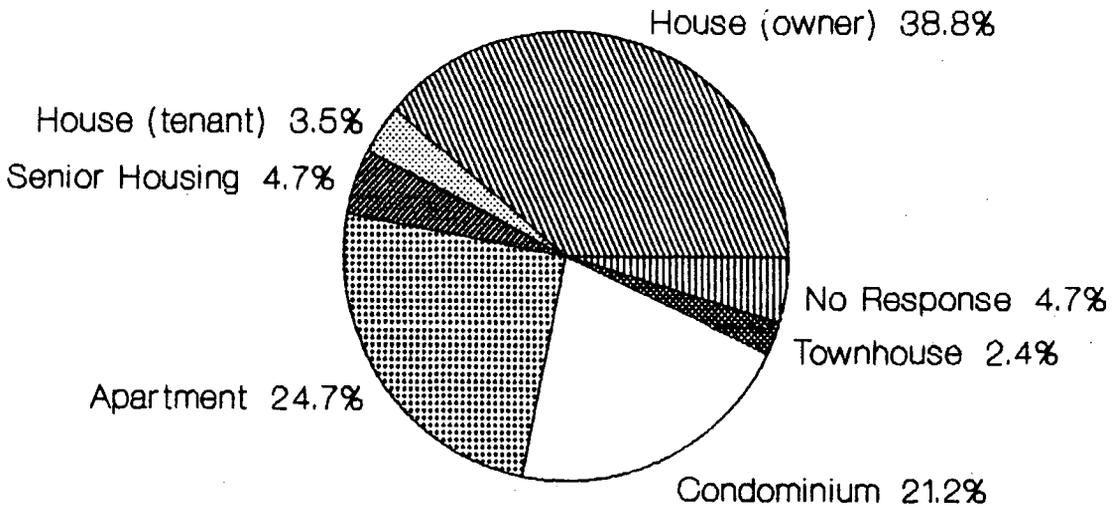
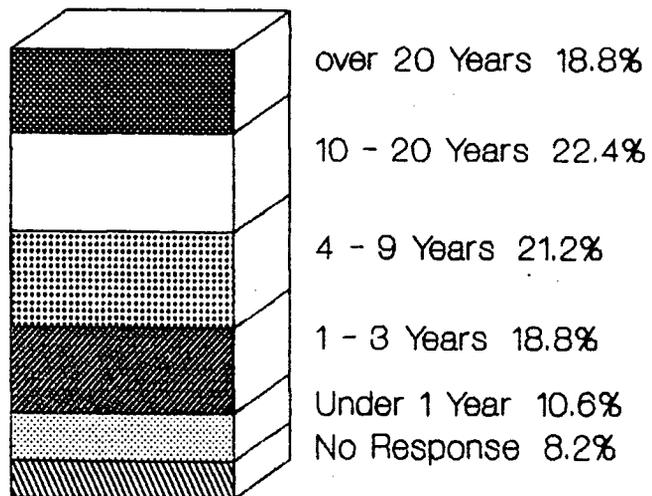


FIGURE 9

LENGTH OF RESIDENCE AT PRESENT ADDRESS



N = 85

Richmond in order to take advantage of the benefits suburban living provides.

5.3.5. Income of Respondents

It is evident from Figure 10 that over half of the respondents surveyed (41.7%) chose not to reveal their total household income for 1987. Many questionnaires were returned with no response chosen for this particular question. A few questionnaires, however, had the comment "very good" written beside the question. The reason for this significant lack of response is unknown since choices were provided and total anonymity of all participants was ensured at the beginning of the survey process. One can only assume that the respondents may have been sensitive when it came to revealing such personal information about themselves and their spouses.

Of those respondents who did reveal their total household income, the largest percentage (12.9%) was found in the under \$8,000 category. Overall, however, the income of the respondents who answered this question showed fairly even dispersal ranging from the largest proportion of 19.9% (under \$8,000) to the smallest proportion of 4.7% (\$17,000 - \$20,000). The income figures designate income of the household or marital unit since all respondents were asked to indicate total income, including that of his/her spouse if married.

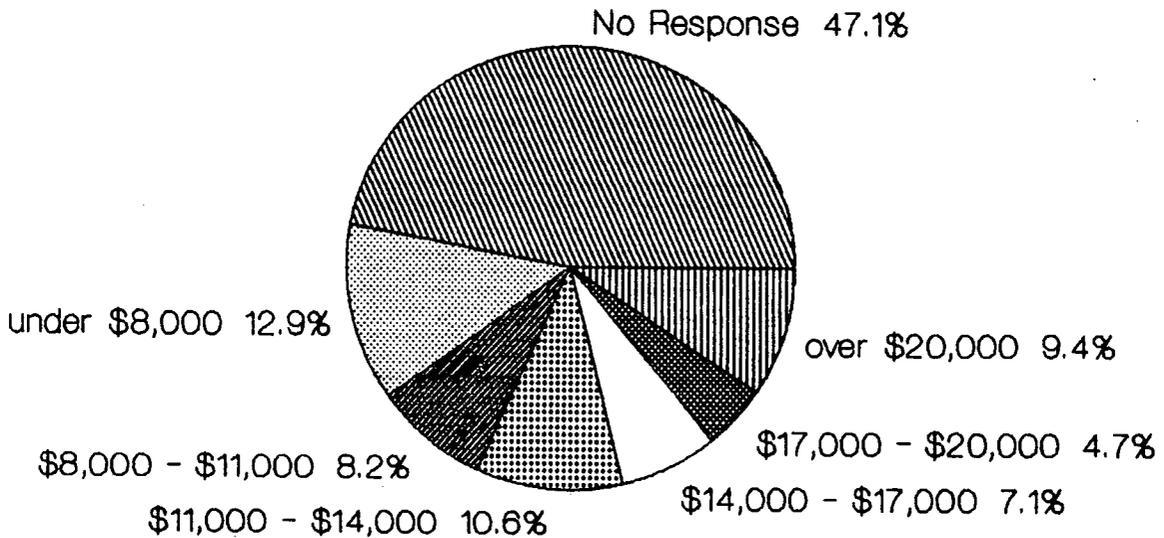
5.4. Travel Characteristics of the Sample

5.4.1. Mode of Transport Used Most Often

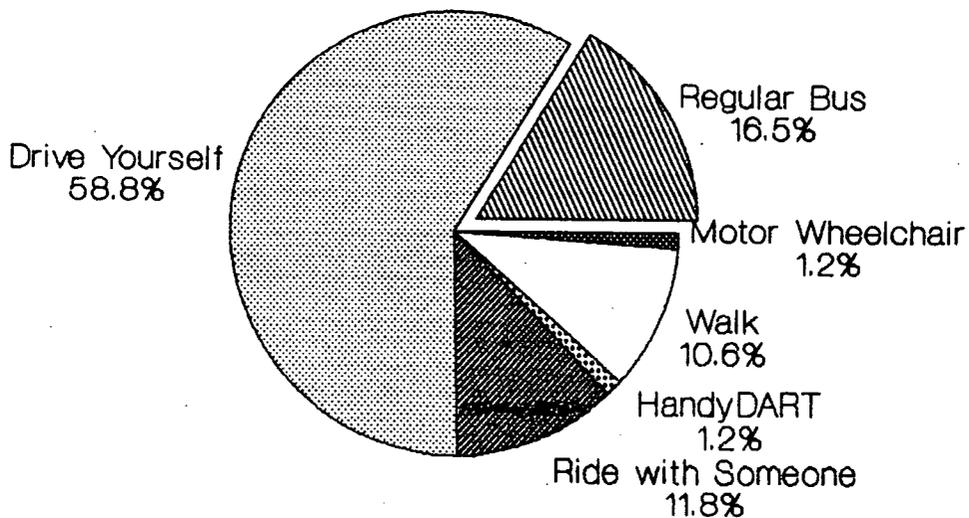
In order to determine how the sample participants got around, respondents were asked to indicate what mode of transportation they used most often to get where they wanted to go. As Figure 11 indicates, 58.8% of the sample use their own car as

FIGURE 10

INCOME OF RESPONDENTS (N = 85)

FIGURE 11

MODE OF TRANSPORTATION USED MOST OFTEN



their predominant mode of transportation. The second most frequently used form of transport is the regular transit bus service falling far behind the automobile with a proportion of 16.4%. Since Richmond's residential areas are at low densities, it is evident that for those seniors who are capable of driving a car, this mode is the most convenient form of travel. In addition, since all of the respondents sampled lived independently within Richmond, most appeared to be relatively agile and independent, and thus still quite capable of driving a vehicle. Although most respondents relied upon motorized vehicles for transport, 10.6% of the sample indicated that their most common form of transport was walking. Many of these individuals lived relatively close to the Town Centre - the prime location of commercial, professional, and recreational establishments.

5.4.2. Frequency and Location of Travel

The vast majority of the Richmond seniors surveyed are relatively mobile and active. As Figure 12 illustrates, when the respondents were asked whether they travelled to the destinations listed (see Appendix B), most claimed to travel to all ten of these destinations. The trip purposes which were chosen as being frequented the least often were the barber/beauty salon (18), followed by visiting friends (6), the post office (14), and the restaurant (13). The grocery store and doctor's office (5 and 2 respectively) were the two destinations to which almost all respondents reported travelling to.

When the respondents were asked how often they travelled to the ten destinations listed, the number of responses for each of the four frequency alternatives are illustrated in Figure 13. From this figure, it is evident that the grocery store, the senior centre, the restaurant, and visiting friends are most often traveled to once or twice a week, while the barber/beauty salon, visiting family, the drugstore, and the

FIGURE 12

DO YOU TRAVEL TO THE FOLLOWING DESTINATIONS?

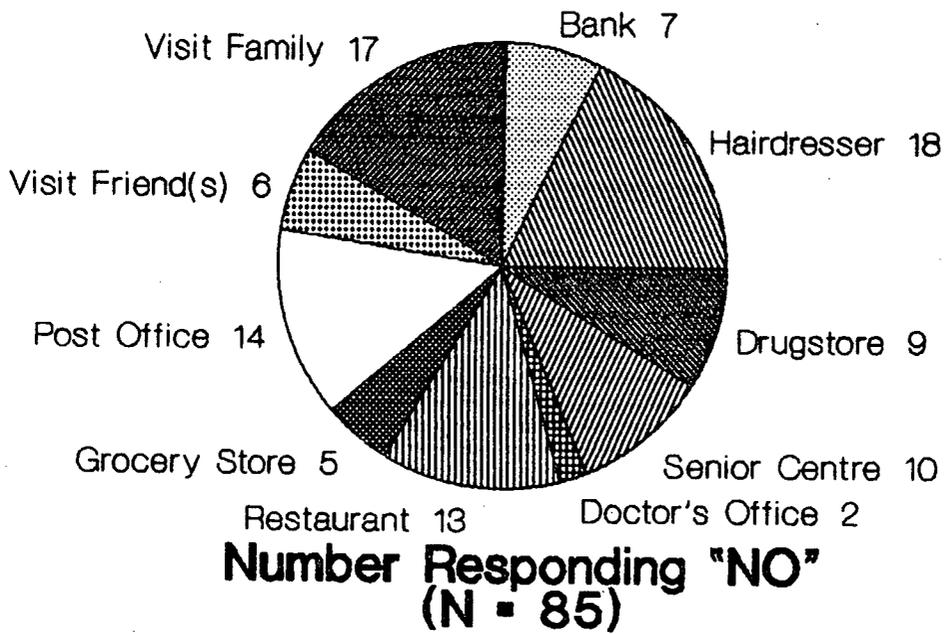


FIGURE 13

How Often Do You Travel To The Following Destinations?

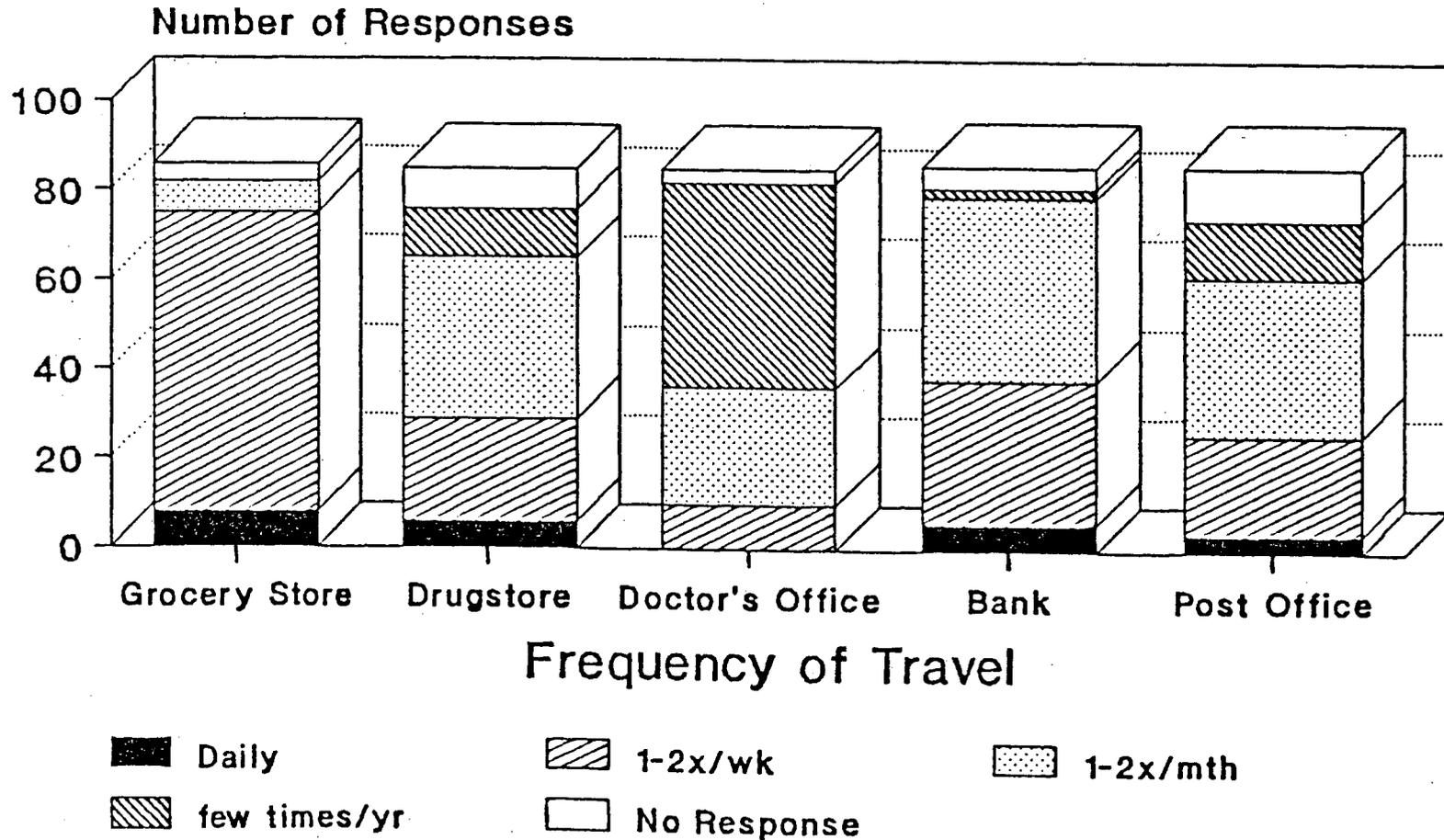
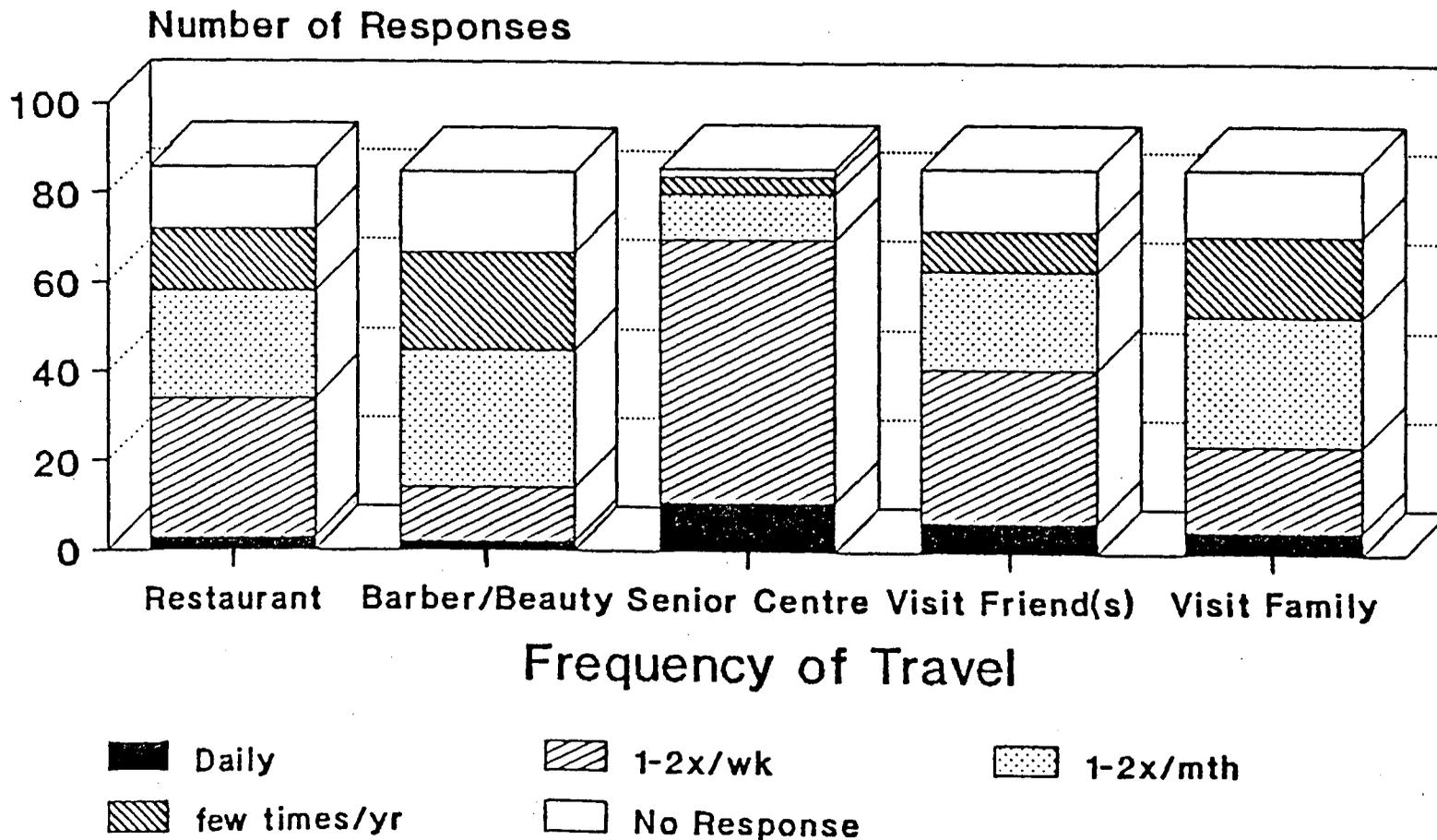


FIGURE 13 (Cont'd)

How Often Do You Travel To The Following Destinations?



bank and post office are most often travelled to once or twice a month. The doctor's office is the only destination to which most of the respondents sampled travel to only a few times a year. The reason why many respondents reported visiting the post office only once or twice a month is that their mail was delivered and stamps could be purchased at the local mall.

Although some of the elderly surveyed reported travelling to destinations outside of Richmond in order to satisfy their daily needs, as Figure 14 illustrates, most of the respondents travelled to destinations within Richmond or in their immediate neighborhood for all ten designated trip purposes, with the exception of visiting family members. Although most of the elderly surveyed appeared to visit friends predominantly in Richmond, many must venture outside of their immediate neighborhood, and the confines of Richmond, in order to visit members of their own family.

5.4.3. Time of Travel

Generally, the elderly respondents carry out their daily business either in the morning (9 am - noon) and/or in the afternoon (noon - 4 pm). Visits to family and friends and trips to a restaurant, however, usually take place after 6 pm, largely because many relatives and friends of the respondents are still employed and eating out was often a special evening with friends and/or family (refer to Figure 15).

5.4.4. Transportation Modes for Various Trips

In order to determine the extent to which various modes of transportation were used for routine trips, a question asking the respondents to indicate what form of transportation they used to get to the ten designated destinations was included in the survey. The results of this question are illustrated in Figure 16. The most popular

FIGURE 14

Where are the following Destinations To Which You Travel Located?

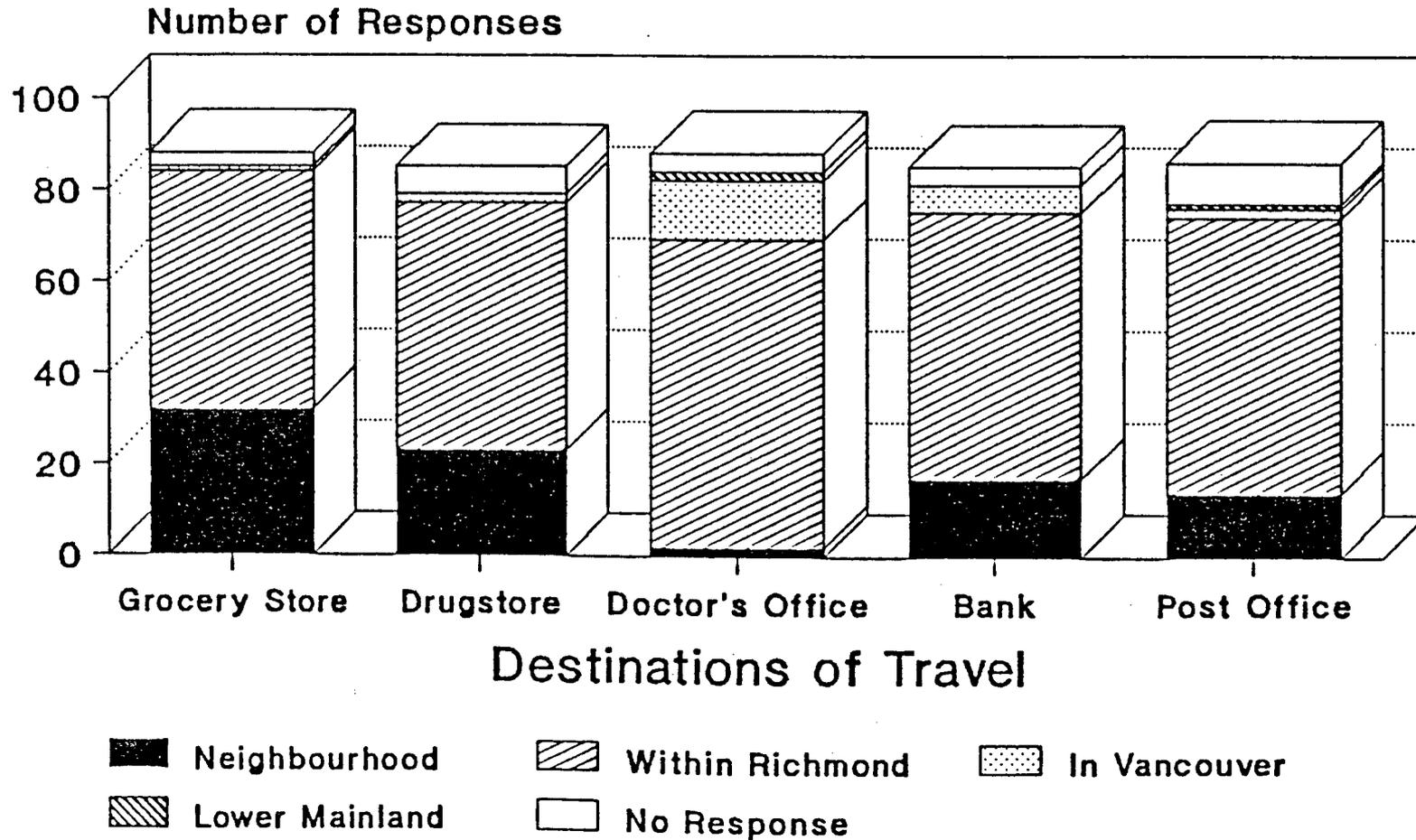


FIGURE 14 (Cont'd)

Where are the following Destinations To Which You Travel Located?

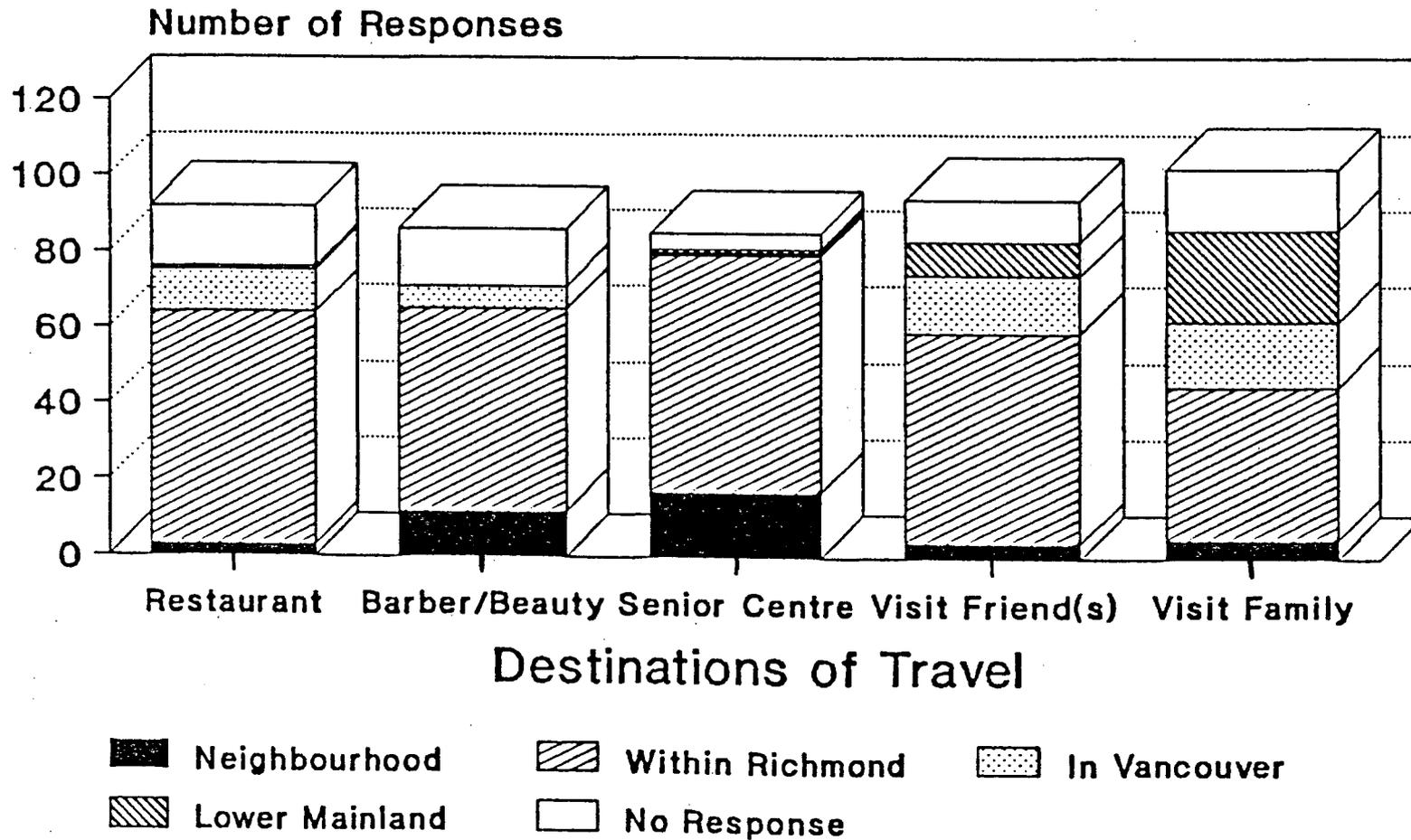


FIGURE 15

What Time of the Day Do You Travel to These Destinations?

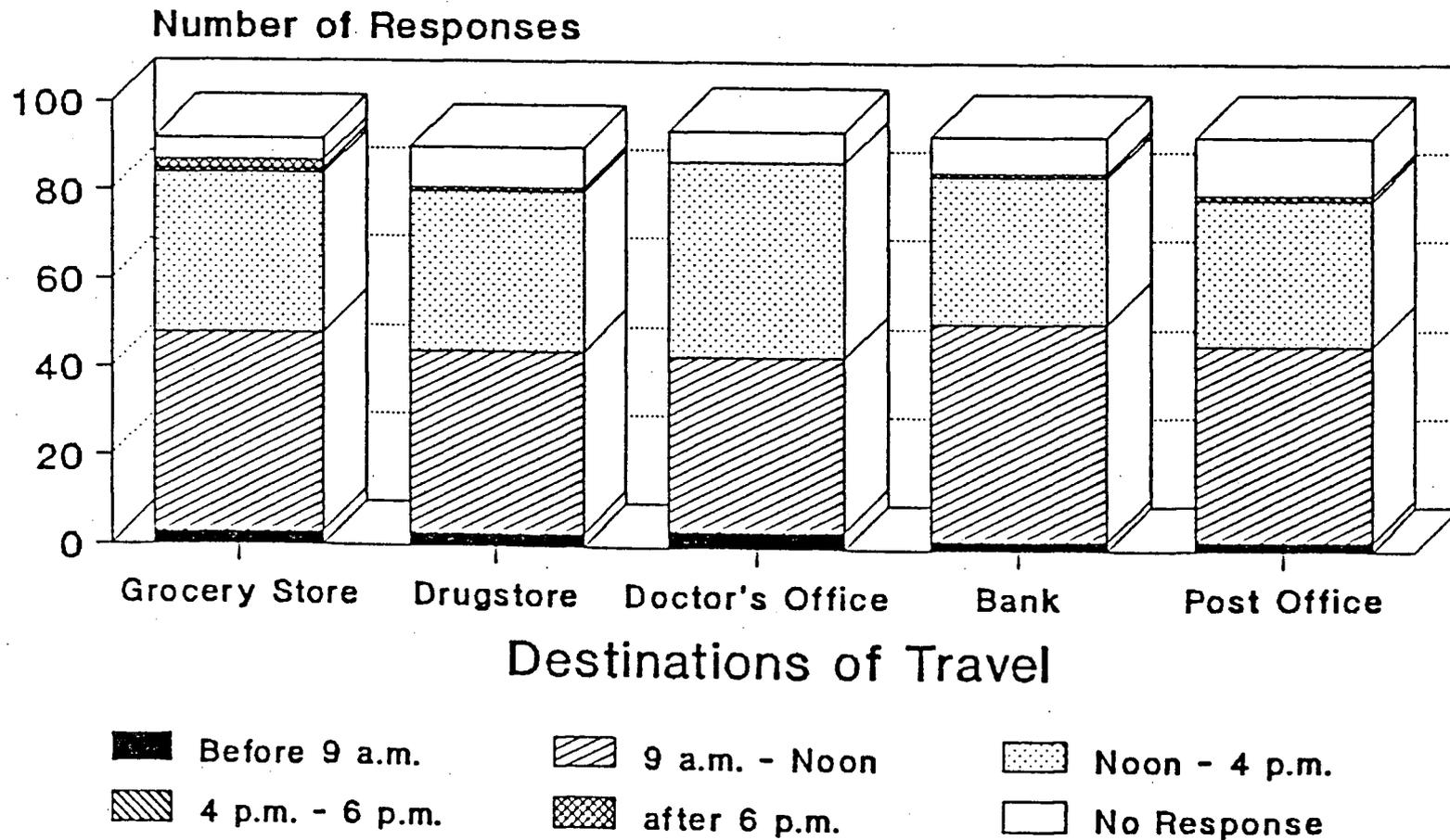


FIGURE 15 (Cont'd)

What Time of the Day Do You Travel to These Destinations?

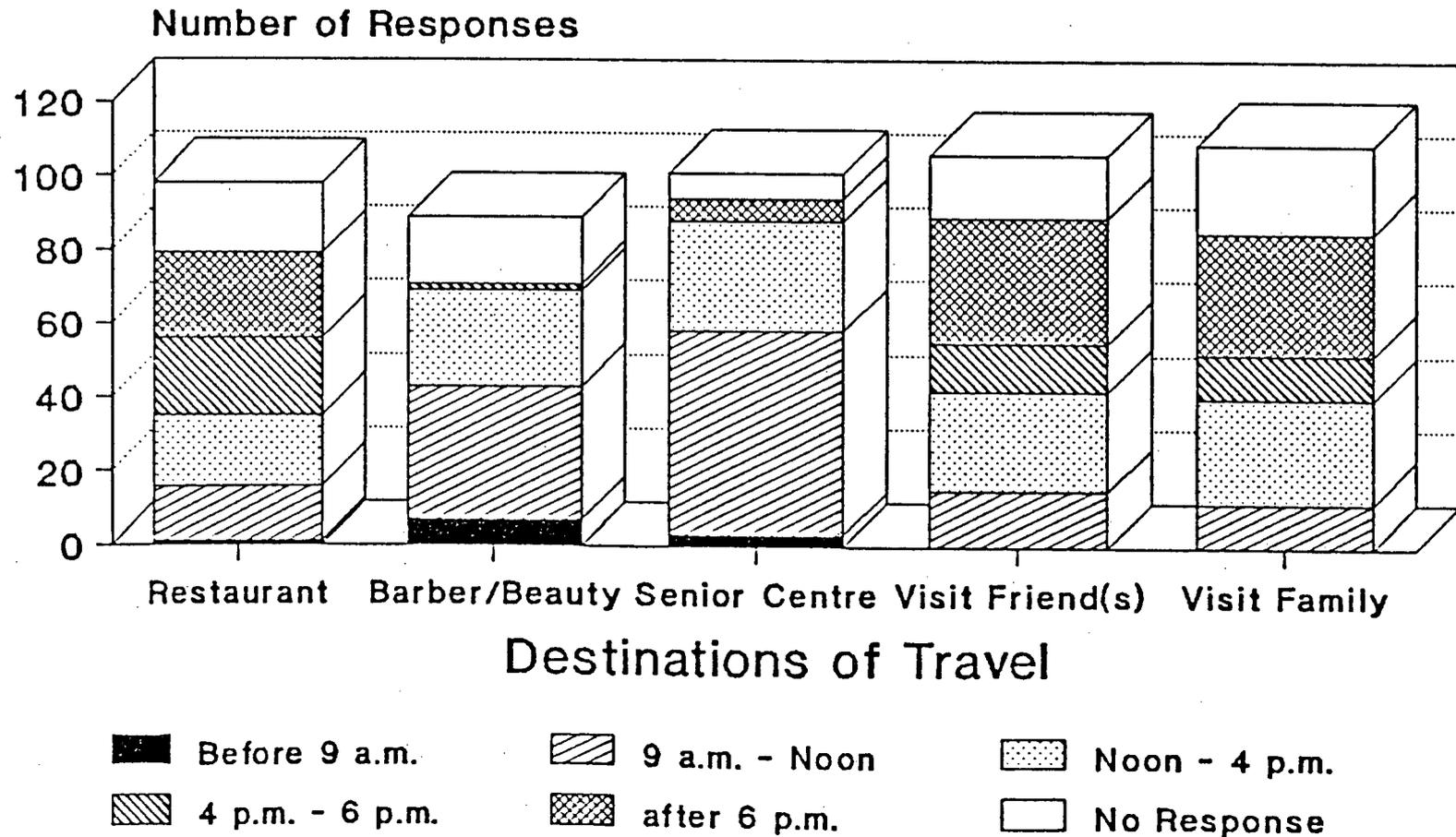


FIGURE 16

What Form of Transportation Do You Use to Get to These Destinations?

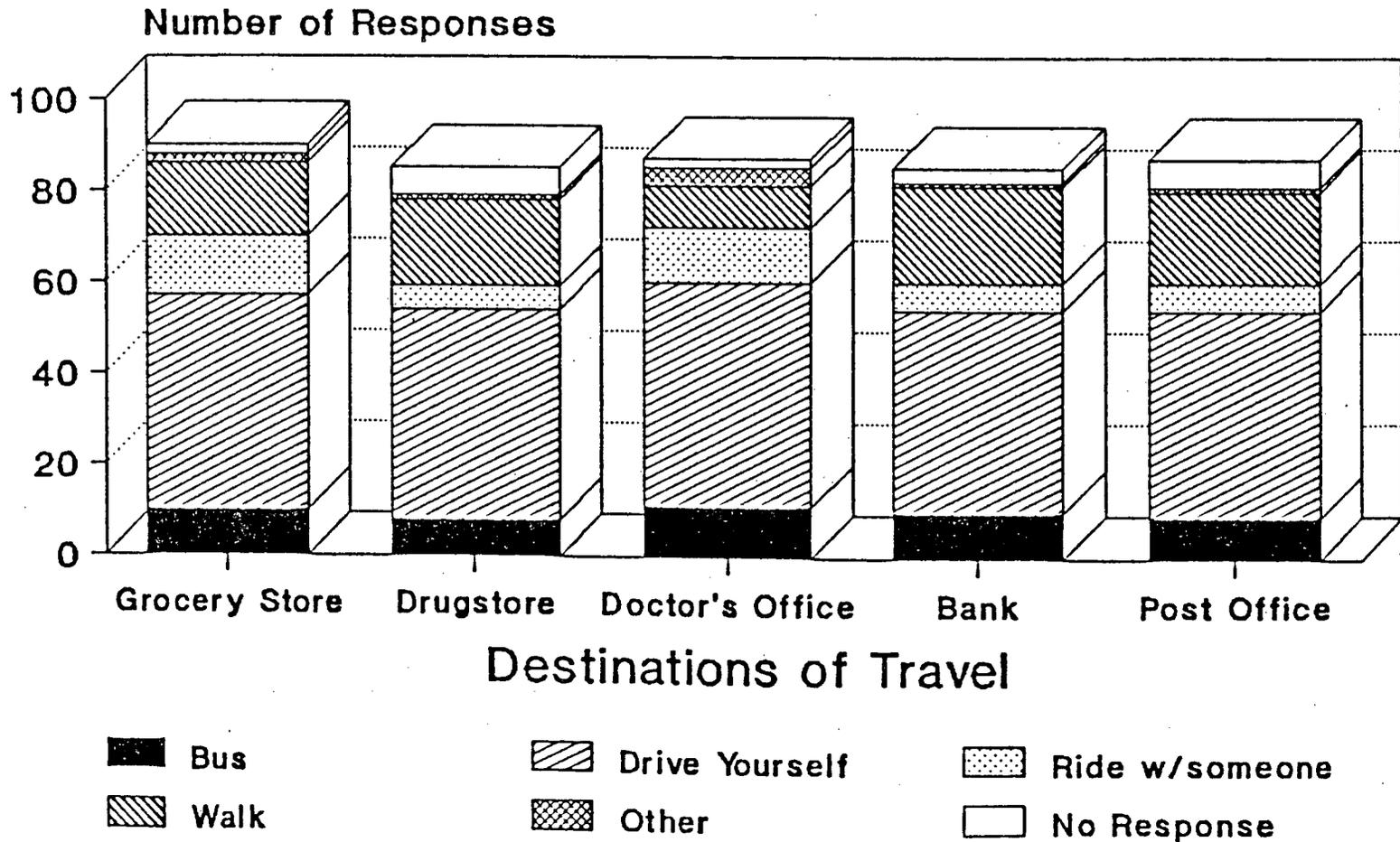
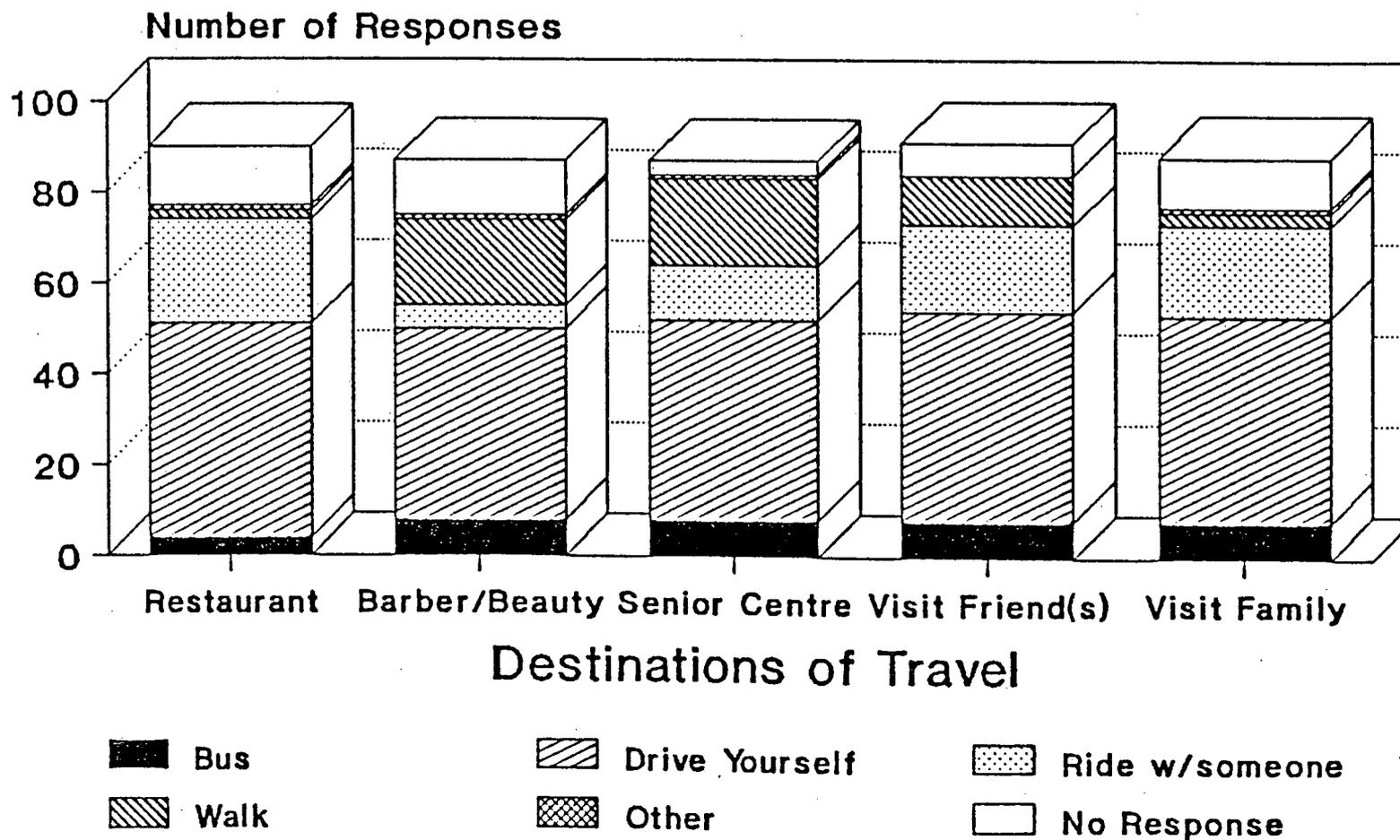


FIGURE 16 (Cont,d)

What Form of Transportation Do You Use to Get to These Destinations?



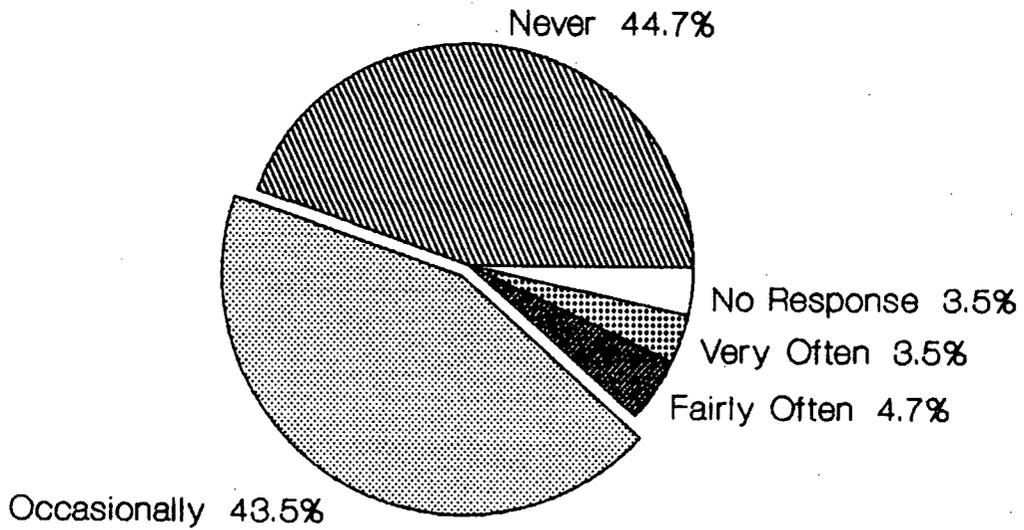
mode of transportation used to get to the listed destinations is by far the respondents' own car. For grocery shopping, in particular, 47 respondents drive themselves, while 13 ride with someone and 16 walk - a surprisingly large number considering such shopping often requires carrying large packages and bundles. The bus is used most often to get to the doctor's office, the grocery store, and the bank, while riding with someone as a passenger is most often the mode of transport used to visit either friends or family or travel to a restaurant. Generally, many respondents reported being driven by a relative or a close friend with whom they intended to spend the evening. The HandyDART transit service is used very rarely by this particular sample group. If used at all, it is generally for a doctor's appointment or some other medical-related purpose. The use of a taxi-cab was not reported by anyone, most probably due to the service's relatively high expense.

5.4.5. Difficulty Encountered in Travel

When the respondents were asked whether they had any difficulty getting to where they wanted to go, 3.5% claimed to experience difficulty very often, while only 4.7% had difficulty fairly often. A similar number of respondents reported never having any problems getting to where they wanted to go and occasionally experiencing some difficulty (44.7% and 43.6% respectively) (see Figure 17). As Table I (Appendix D) indicates, the difficulties most often encountered by the sample members who indicated difficulties in getting where they wanted to go were: "Don't like riding the bus", "No bus line nearby", "Don't like to drive myself", and "have trouble getting in and out of bus". Furthermore, 14 additional difficulties were disclosed with "poor bus connections" reported by five of the respondents indicating difficulty.

FIGURE 17

DO YOU HAVE ANY DIFFICULTY GETTING TO WHERE YOU WANT TO GO ?



5.5 Auto Availability and Use

A series of questions were included in the survey to determine the respondents' ownership and use of a private vehicle. In response to the particular question asking whether the respondent and his/her spouse had a currently valid driver's license, 71.8% of the respondents claimed possession, while those with spouses reported that only 67.4% of their partners had a driver's license (see Figure 18).

Seventy-three percent of the sample reported owning at least one currently licensed motor vehicle and 81.2% of the respondents reported no problems in driving a car both for themselves and their spouse (see Figure 19 and 20). The few that elaborated upon their specific problems in driving a car revealed the following difficulties: arthritis in hands; poor vision; difficulty in driving in traffic.

When asked whether there were any times of the day or particular circumstances during which the respondent would prefer to take a bus rather than use a car, 41.2% of the sample responded negatively (see Figure 21). Although car ownership figures revealed the prevalence of private car transportation among the elderly surveyed, many respondents stated that when going into Vancouver they prefer taking the bus. Other particular circumstances or times of day when respondents would prefer to take a bus rather than use a car are found in Table II.

5.6. Use of Public Transit

Overall, 56.5% of the elderly surveyed stated that they use the public bus service in Richmond (see Figure 22). The reason provided most often by those respondents who did not use transit service was that they have no need for the bus since they own a car. The car was frequently referred to as the most convenient and comfortable mode of transportation.

FIGURE 18

DO YOU OR YOUR SPOUSE HAVE A VALID DRIVER'S LICENSE ?

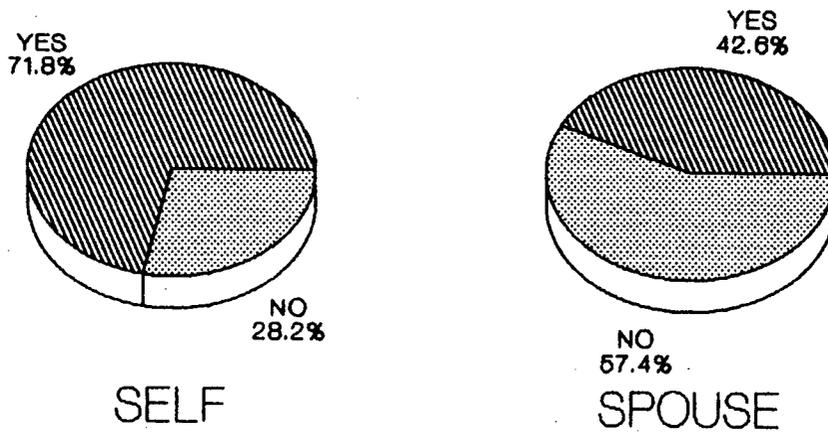


FIGURE 19

DO YOU OR YOUR SPOUSE OWN A CURRENTLY LICENSED VEHICLE ?

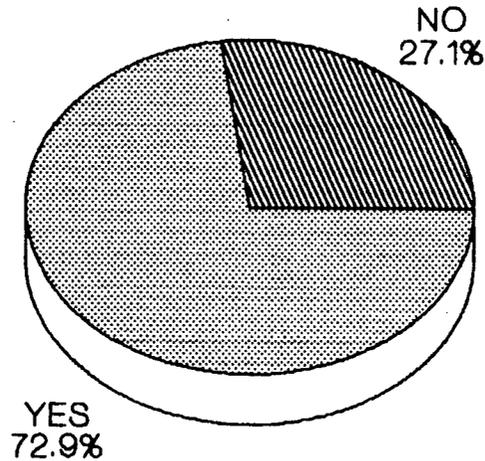


FIGURE 20

DO YOU OR YOUR SPOUSE HAVE PROBLEMS DRIVING A CAR ?

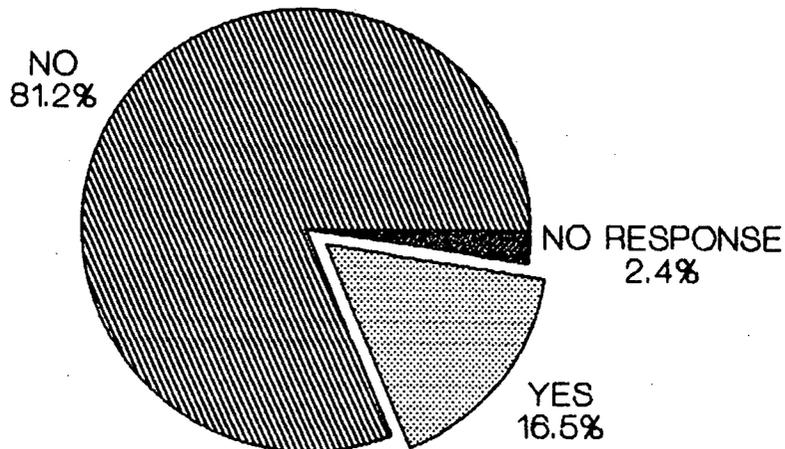
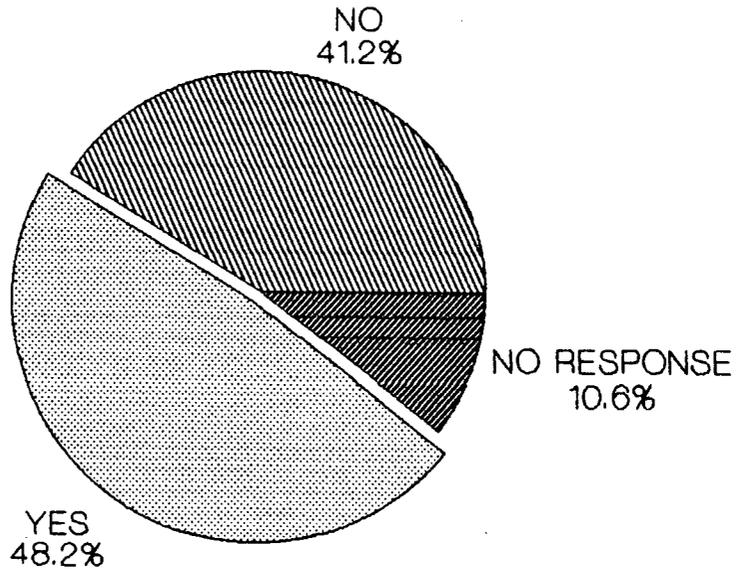


FIGURE 21

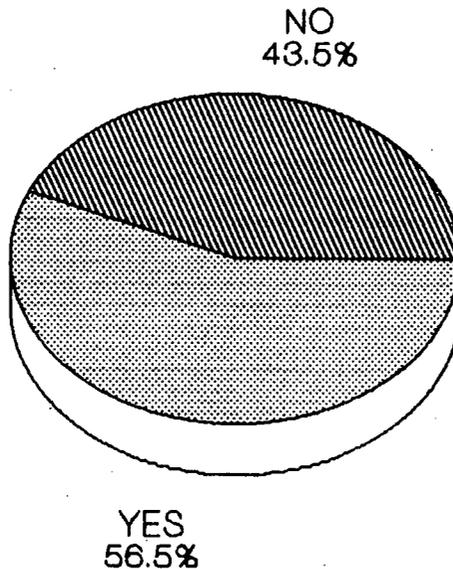
ARE THERE ANY TIMES WHEN YOU WOULD PREFER TO TAKE THE BUS ?



Elaboration upon "YES" (TABLE II)

FIGURE 22

DO YOU USE THE REGULAR BUS SERVICE IN RICHMOND?



5.6.1. Time and Frequency of Public Transit Use

The bus is used once or twice a week by 18.7% of the bus-users in the sample, while 27.1% of the respondents use the bus once or twice a month. The majority of respondents (46.8%), however, reported using the bus only a few times a year, mainly when going into downtown Vancouver. Only 8.9% of the sample claimed to use public transit on a daily basis (see Figure 23). When asked how frequently the bus was used to go outside of Richmond, 64.4% of the respondents claimed using the bus for this purpose on an occasional basis (see Figure 24).

All bus-users in the sample reported normally using the bus either sometime between 9 am and noon or noon and 4 pm since this was when they carried out most of their daily tasks and errands (see Figure 23). Some claimed that buses running during the peak hour were much too crowded and young riders were often too noisy. Peak hour bus travel times were therefore most often avoided.

5.6.2. Problems/Benefits of Public Transit Use

While the number of persons noting problems in using the bus is not large, it must be remembered that only 56.5% of the total sample reported using the bus; the majority only a few times a year. The problems cited by these bus-users are listed in Table III. Some respondents complained of having to transfer too often, while others revealed having trouble getting into and out of the bus. Many complained that the bus connections within Richmond are very poor, thus forcing them to spend a long time waiting for a bus.

When asked what advantages the respondents could see in using the bus as opposed to a private vehicle, frequent responses were "no worry about parking" and "it's cheaper than using my own car". Refer to Table IV for all the advantages cited

FIGURE 23

TIME AND FREQUENCY OF USE OF RICHMOND'S BUS SERVICE

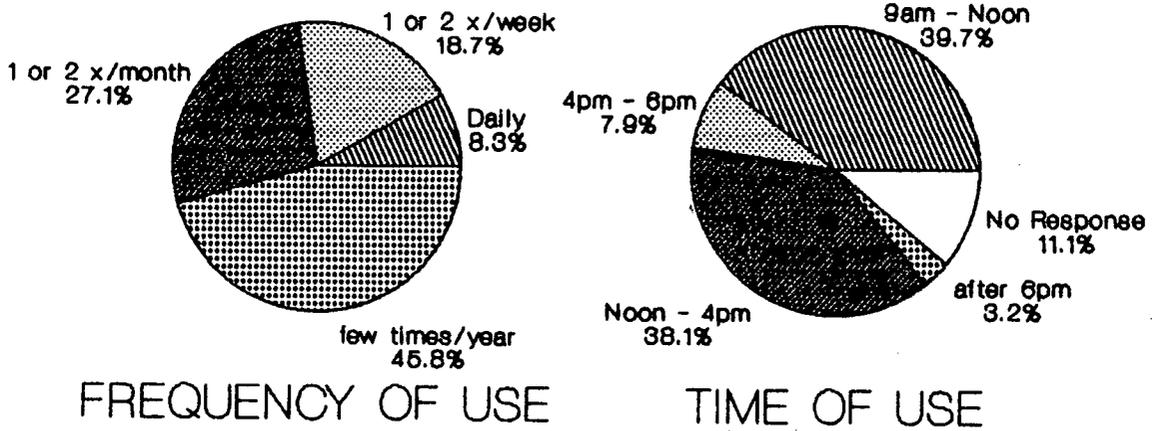
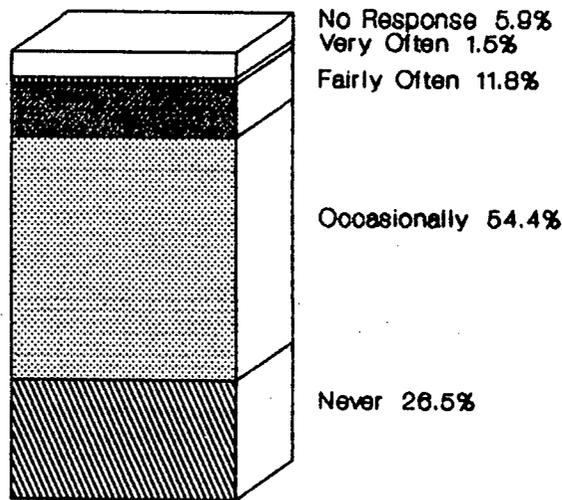


FIGURE 24

HOW FREQUENTLY DO YOU TRAVEL ON BUS OUTSIDE OF RICHMOND ?



by the respondents.

5.6.3. Cost of Public Transit

Although some respondents reported a problem with paying an extra fare for going outside of Richmond, the large majority reported no problem with having to pay an extra fare for 2 zones. Generally, the researcher sensed that the elderly respondents perceived the cost of bus transit to be fairly reasonable. During conversations with the researcher, most respondents stated that the concessionary fare (65 cents) charged to the elderly was "no problem at all". The cost of bus service, therefore, did not appear to be a consideration in the decision to use the public transit system.

5.6.4. Improvements to Public Transit

A number of improvements to the bus system which would likely persuade the respondents to use the bus more often were raised by the sample surveyed (see Table V). Many of these improvements centered on the issue of poor bus connections. A number of respondents claimed that more bus routes were required running east and west throughout Richmond. These individuals suggested that buses should run more frequently - a remark contrary to the assumption that most elderly have ample discretionary time and thus can afford to be quite flexible with transit schedules. Other suggested improvements included the following: "more connecting routes at transfer points"; "the driver should wait until everyone is seated before starting"; and "the bus driver should slow down and give people time to get off".

5.6.5. Use of Alternate Transportation Systems

Only 10.6% of the respondents reported ever using the HandyDART custom transit service in Richmond. Most mentioned, however, that they were indeed aware of the service (see Figure 25). Those individuals that reported using HandyDART claimed it was for a medical purpose (see Table VI). It appeared that those respondents who were aware of the HandyDART system believed that the service was provided for medical and health-related appointments only.

As Figure 26 indicates, 41.2% of the respondents were aware of the Community Leisure Transportation Service for community groups in Richmond, yet only 11.8% reported ever using it. Since the Community Leisure Transportation Service is solely for the use of groups rather than individuals, this explains the low use of this service by select respondents.

5.6.6. Need for Exclusive Transportation Service

When asked whether it was believed that some form of transportation for all kinds of trips catering exclusively to the elderly should be provided in Richmond, 36.5% of the sample claimed that such a service was unnecessary (see Figure 27). Many of the individuals who responded "Yes", however, were willing to pay only the same fare as they are being charged for regular transit. The user cost of such an exclusive service, however, would inevitably be greater, particularly if it was a privately-run service. From casual conversations with some of the respondents, it was apparent that many did not feel "old enough yet" to be segregated from the rest of the population. Others claimed that since they were still quite capable of using the available public transportation alternatives, they would have no need for such an exclusive system. Furthermore, they added that once they were no longer capable of using either their

FIGURE 25

USE AND AWARENESS OF THE HANDYDART CUSTOM TRANSIT SERVICE

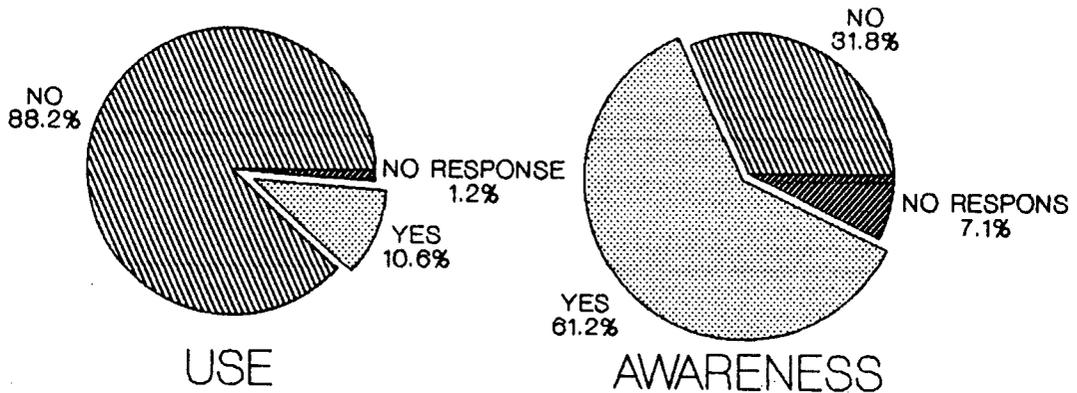


FIGURE 26

USE AND AWARENESS OF THE COMMUNITY LEISURE TRANSPORT SERVICE

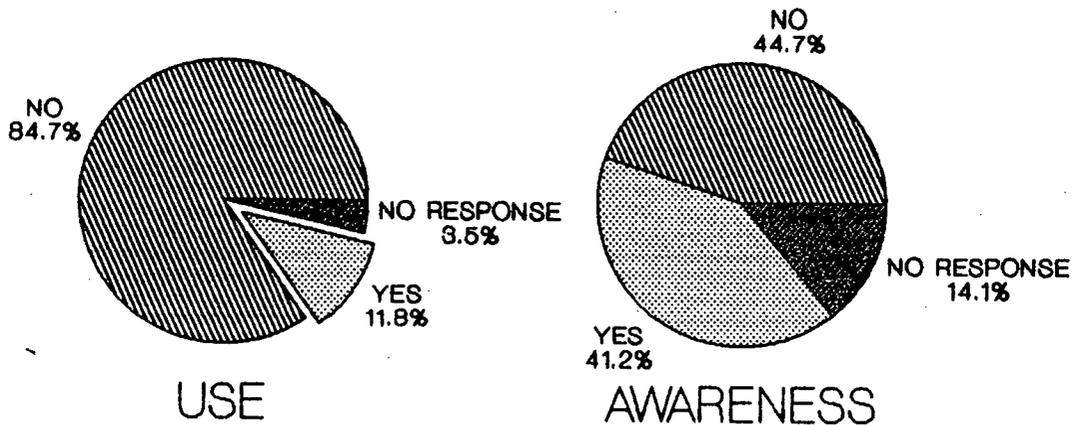
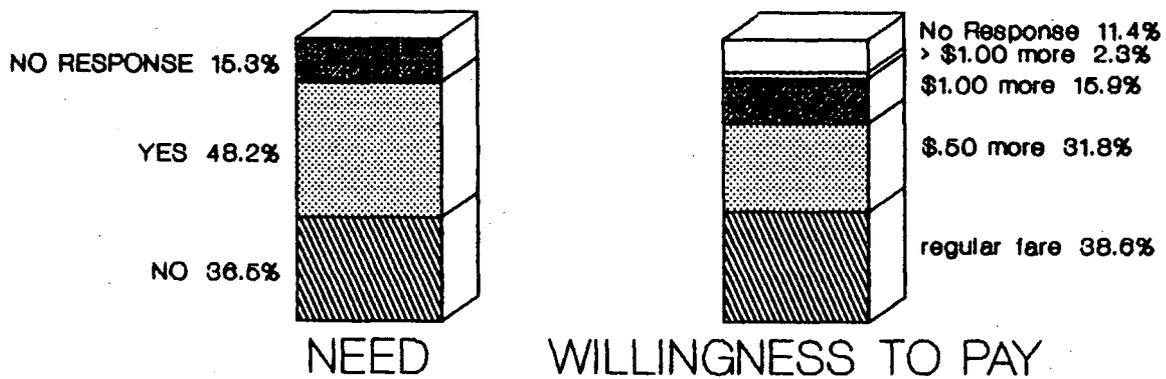


FIGURE 27

A TRANSPORTATION SERVICE CATERING EXCLUSIVELY TO SENIORS ?



own car or the public bus service, they would then use the HandyDART system to get around. Many of the elderly respondents were still quite active and proud of the fact that they were just as capable as their younger counterparts in getting around, thus an exclusive system designed solely for these individuals was unnecessary. Finally, some of the elderly stated that the cost of such a system would be exorbitant - "totally out of the realm of one's ability to pay".

5.7. Importance of Public Transportation Characteristics

Towards the end of the questionnaire, the respondents were asked to envision a public transportation system which would best satisfy the travel needs of older people like themselves. Subsequently, a number of characteristics, broken down into the following three categories: Features of Regular Bus; Features of a Personalized Transportation System; and Vehicle and Service Features, were provided for the respondents to evaluate in terms of importance within their envisioned ideal system. The choices available were as follows: Essential, Very Important, Somewhat Important, and Not Important. The results of this question are found in Table VII.

Most of the respondents (45.9%) considered signs on the bus to identify where it is going as essential. Distance to the bus stop, shelter at the bus stop, frequency of service, having the driver announce each destination, and adherence to printed schedule were regarded as very important features within their ideal transportation system. Thirty-five percent of the respondents regarded the number of transfers required to reach desired destination as somewhat important. When asked specifically about reserved seats for seniors, the responses were fairly evenly distributed. Many respondents claimed that there were enough reserved seats on the bus already, while some reported that reserved seats only serve to further segregate the elderly from the rest of society.

As illustrated by the figures in the second section, "Features of a Personalized Transportation System", the number of respondents choosing not to respond was relatively high compared to the previous section. The reason for this may be that since many of the elderly respondents may have felt that such a system was not applicable to them, they chose not to respond. Others may have associated the question with earlier inquiries on the HandyDART transit service and decided not to respond because they did not use the service. Even some of the individuals that did respond to the listed characteristics wrote down "maybe for others, but not for me" next to their selection. This may illustrate that since the independent-living elderly in this survey were still agile and physically mobile, they did not appear to need the type of services that a personalized transportation system could offer. Generally, however, all of the listed features under this section were regarded most frequently as either somewhat important or not important.

Finally, in the third section, "Vehicle and Service Features", most of the elderly surveyed appeared to feel that a friendly and courteous driver, the number of steps required to board and exit the vehicle, the courtesy of other passengers, and visible safety features were very important. Size of the vehicle and evening service were most often rated as somewhat important for the ideal public transportation system envisioned by the elderly.

The final inquiry on the questionnaire asked the participants whether they had any other comments to make regarding the transportation alternatives available to them within Richmond. The various responses to this concluding question are listed in Table VIII.

CHAPTER SIX

DISCUSSION OF SURVEY FINDINGS

6.1. Sample Demographics

The demographic profile of the sample (N=85) reveals a mostly younger elderly group of individuals with a predominance of female over male respondents. A significant number of the females live on their own (57.7%), while most of the males are married and living with their spouse. Most of the respondents have lived at their present address in Richmond for at least 4 years or more and the majority live either in their own homes or in an apartment or condominium. The household income of those respondents who revealed this information is quite diverse, ranging from 9% of the sample in the under \$8,000 income category through to 9.4% of the sample in the more than \$20,000 income category. Generally, the respondents' place of residence is relatively dispersed throughout the area of Richmond bounded by the North Arm of the Fraser River, the South Arm of the Fraser River, and No. 5 Road.

6.2. Travel Habits

The elderly surveyed are fairly active and social. Most visit their favorite senior centre and friends in Richmond at least once or twice a week and they enjoy going out to restaurants just as frequently. Generally, their visits to the doctor occur most often a few times a year, thus overall, they appear to be relatively healthy. The vast majority of the respondents carry out their daily errands sometime between 9 am and 4 pm during the day in order to avoid the chaos of rush hour traffic. Most of their travel destinations are located within Richmond, with the exception of visiting family members whose residential locations tend to be quite geographically dispersed. Although private vehicles are the main form of transportation for those elderly respondents who

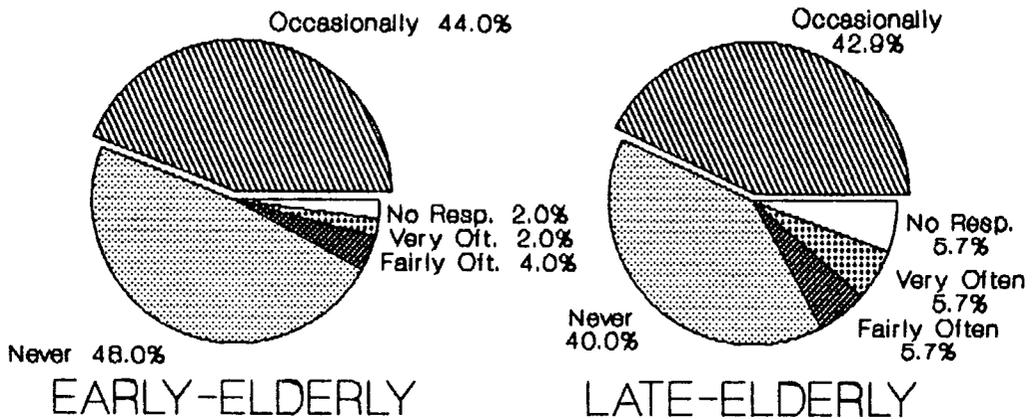
own their own automobile, the bus is used most often to get to the grocery store and to the doctor's office. When a particular activity involves socialization with others, such as going to a restaurant or visiting family, many respondents normally get a ride with either their spouse, a friend, or a family member.

In regard to the frequency of encountering difficulty in getting where one wants to go, most of the respondents could almost equally be divided into two groups - those that reported never having difficulty and those that occasionally encounter problems. Since Wade (1983) has stated that the age of 75 is the broad cut-off point for sustained and declining physical activity characteristics in the elderly population, the rates of disability that have been detected in this late age category would almost certainly affect an elderly individual's mobility. In consequence, one would assume that individuals falling into the late-elderly age category (76+ years) would encounter greater difficulty in getting where they wanted to go compared to the early-elderly (60-75 years). In this survey, however, this assumption failed to be substantiated since 42.9% of the late-elderly sampled claimed to encounter occasional difficulty getting to where they wanted to go, while 44% of the early-elderly respondents reported experiencing occasional difficulties. In addition, 40% of the former group reported never having difficulty, whereas 48% of the latter group did likewise (see Figure 28).

Although there appears to be no significant difference between the two age groups of elderly in the degree of difficulty they encounter in getting around, the late-elderly individuals surveyed reported encountering certain types of difficulties more often than the early-elderly. For example, more late-elderly respondents identified difficulty in getting in and out of the bus and walking to the nearest bus stop. Furthermore, this group of seniors was more likely to select more than one of the listed difficulties provided, as opposed to the early-elderly group who generally chose only one response. This appears to illustrate that the late-elderly, aged 76+ years, tend to encounter greater mobility difficulties than younger elderly individuals.

FIGURE 28

DO YOU HAVE ANY DIFFICULTY GETTING TO WHERE YOU WANT TO GO?



The mode of transportation used most often by respondents in both age categories shows interesting differences (see Figure 29). It is apparent that proportionately more of the early-elderly respondents drive themselves and use the bus as their most frequent mode of transportation. Members of both age categories appear to ride with someone just as often, while more of the late-elderly respondents reported walking as their most frequent mode of transportation. Furthermore, the two elderly individuals who identified the HandyDART transit service as their most common mode of transportation were both over 75 years of age.

6.3. Car Ownership

Many of the elderly surveyed evidently relied quite heavily on their own cars for transportation. Comments such as "With my car, I can come and go as I like", and "I can't see anyone without a car in Richmond; for someone that's active, everything is too far apart" illustrate the importance placed upon private transportation. Of the total sample surveyed, 73% of the respondents reported owning a currently licensed motor vehicle. When the respondents are subsequently broken down into the age categories of early and late-elderly, the findings are noticeably different.

Although proportionately 78% of the early-elderly respondents reported having a current driver's license, only 60% of the late-elderly respondents held one (see Figure 30). Furthermore, 66.7% of the spouses of the married early-elderly respondents had a driver's license, whereas 72.2% of the spouses of the late-elderly did not (see Figure 31). This may be because the older seniors surveyed may have matured in an era when driving was the responsibility of males, thus spouses had to rely on their partner

FIGURE 29

MODE OF TRANSPORTATION USED MOST OFTEN

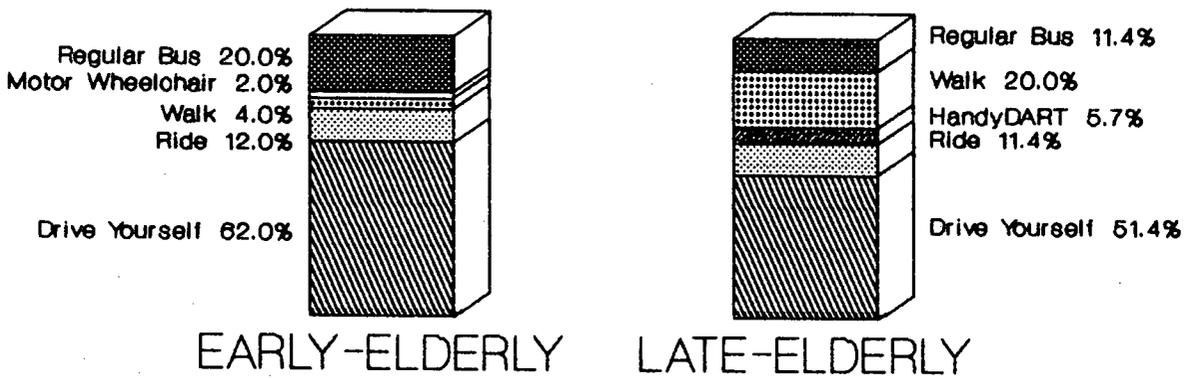


FIGURE 30

DO YOU HAVE A CURRENTLY VALID DRIVER'S LICENSE?

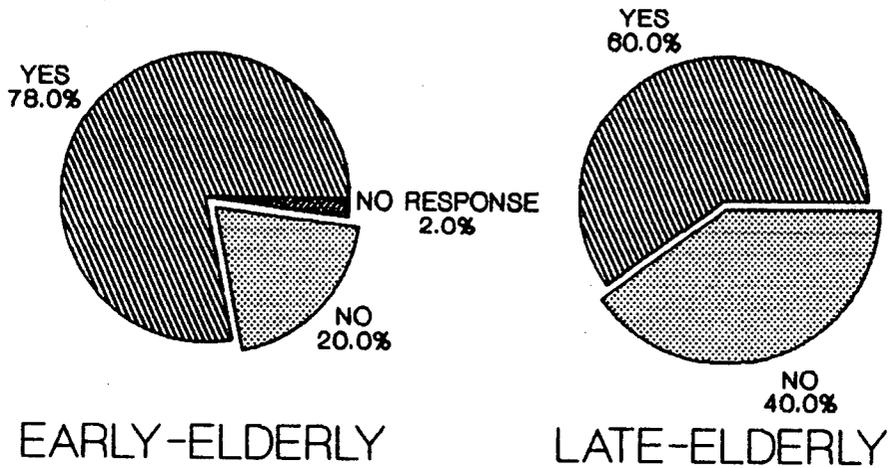
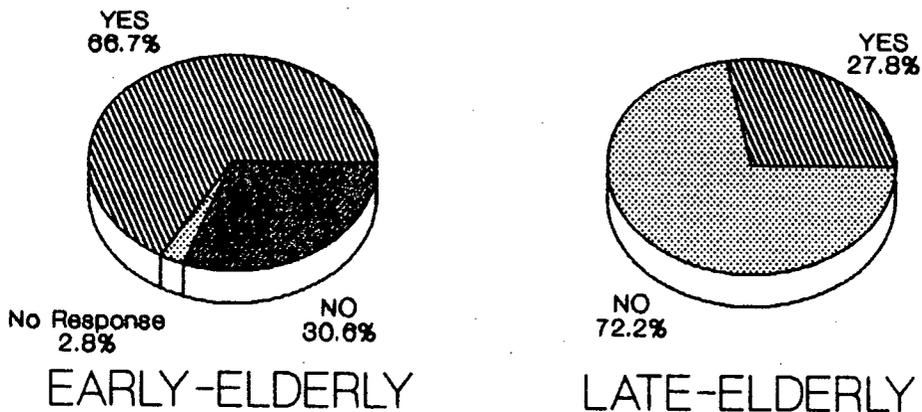


FIGURE 31

DOES YOUR SPOUSE HAVE A CURRENTLY VALID DRIVER'S LICENSE?



for transportation.

The early-elderly respondents are also slightly more likely than the late-elderly respondents to own a motor vehicle (see Figure 32). A similar proportion of the elderly in both age categories, however, reported having no trouble driving (see Figure 33). Many of the elderly surveyed, however, may have been unwilling to admit to a problem since they came across as being very confident and proud of their capabilities.

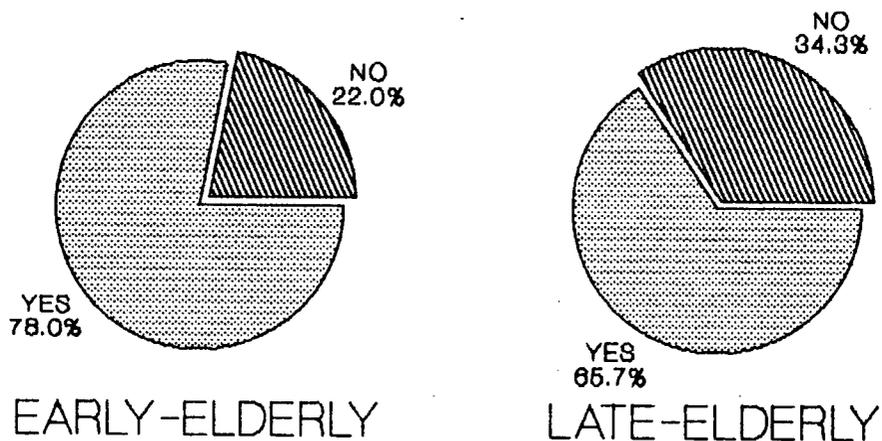
In summary, therefore, the responses of the late-elderly did in fact differ from those of the younger group of respondents in regard to auto availability. Proportionately more of the early-elderly respondents owned a motor vehicle and more of them and their spouses possessed a driver's license. In consequence, therefore, the average age of 75 years may indeed be the turning point toward progressively worse mobility difficulties.

6.4. Use of Public Transportation Alternatives

The bus was reported as being used by a little over a half of the total sample surveyed. Many respondents claimed to use the bus only a few times a year; the most popular reason being into downtown Vancouver. It was apparent that parking in Vancouver posed a significant problem for many of the elderly surveyed, and as a result, they chose to take the bus into Vancouver. Since most of the respondents carried out their daily business within Richmond and drove themselves where they needed to go, they did not use the bus on a regular basis. When comparing the degree of bus use between the late-elderly and early-elderly respondents, the use of transit is strikingly similar (see Figure 34). Fifty-six percent of the respondents in the latter category reported using the bus, while 54.3% of the respondents in the former age category reported such use.

FIGURE 32

DO YOU OR YOUR SPOUSE OWN A CURRENTLY LICENSED VEHICLE?

FIGURE 33

DO YOU OR YOUR SPOUSE HAVE PROBLEMS DRIVING A CAR?

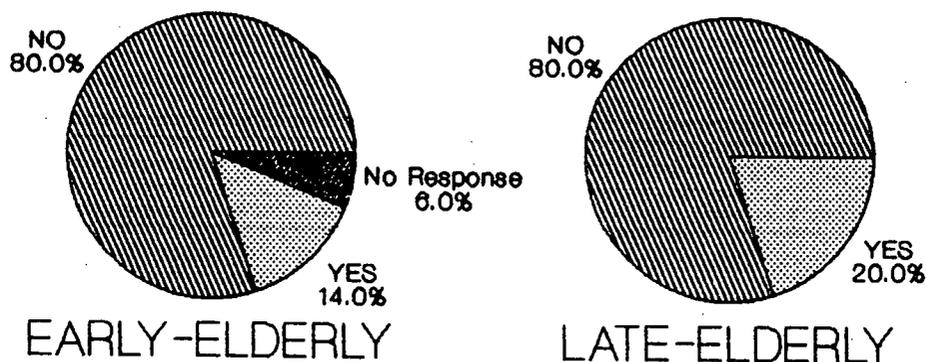
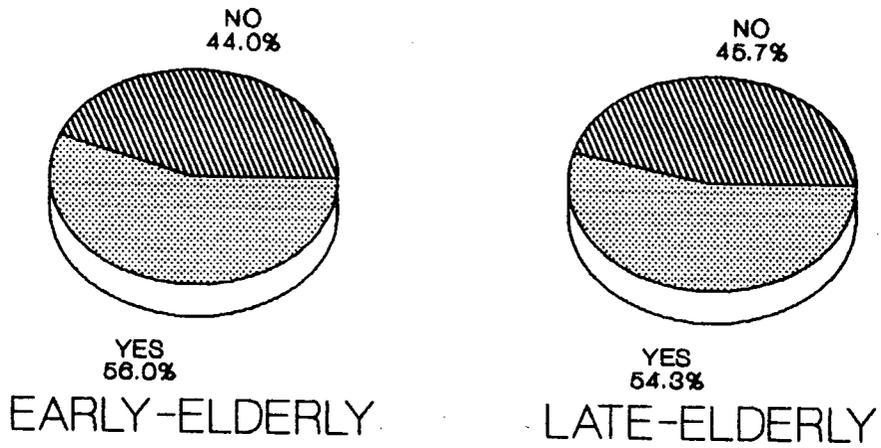


FIGURE 34

DO YOU USE THE REGULAR BUS SERVICE IN RICHMOND?



Problems with the local bus system, however, also contributed to the low usage rate by the respondents. Many claimed that waiting for a bus on a major street, such as No. 3 Road, in order to get home heading either east or west was too long. The issue of poor connections was mentioned by many respondents ie. "better connections"; "more connecting routes at transfer points"; "an east-west service (west dyke to #5 or #6 Road); "virtually no cross-town connections on New Westminster Highway, Williams Road, and Francis Road"; and "long waits and poor connections". Respondents were perceived to be satisfied with transit service available on major routes running north to south and vice versa, such as #3 Road through the Town Centre, yet they were evidently frustrated with the bus connections from these major streets taking them either east or west to their place of residence. Some reported having to stand and wait in cold weather, often being further aggravated when the bus which passed by was already full.

Other problems with public transit dealt with the frequency of service. A common complaint was having to wait too long for service and cross-connections, while a familiar request was "more frequency", especially on a Sunday. "You have to wait too long in Richmond if you miss a bus". Furthermore, the fact that too many transfers were required to reach a desired destination was also frequently raised as a complaint. Although very few of the elderly surveyed experienced problems with bus drivers, a few respondents claimed that the drivers are often too impatient ie. "they start moving the vehicle before one has had a chance to sit down". Most claimed that fellow passengers were generally very kind and willing to give up a seat, although one individual complained of "unruly and loud young people that get on and use bad language".

Other "vehicle-design and maintenance" complaints centered on three main issues: "the type of door design is too narrow"; "the number on the bus identifying where it is going is too high up; for the sake of the visually impaired, it should be put further

down on the front window, right where the door opens"; and "often the windows are dirty and require cleaning".

Suggested improvements to the existing public transit system centered around "better and more connections"; "greater degree of frequency"; "more service, especially on Saturdays, Sundays, and holidays"; and most often, "more east to west service as all lines lead either to Brighthouse or Vancouver".

Although the problems with bus use listed above are very informative, they are not necessarily age-specific. In fact, these problems could just as well be concerns of the younger adult population of Richmond using the suburb's bus service. This may be because most of the elderly respondents in this study were approached either at a senior centre or church activity meeting, and thus, are still relatively healthy and active. Consequently, their problems would likely not differ significantly from other healthy and active members of Richmond's population.

A significant number of advantages with the bus as opposed to private transportation were reported by many respondents. The overwhelmingly large advantage was in parking. By using the bus, these individuals could avoid the hassle and frustration of fighting traffic and having to find spaces in which to parallel park their vehicle. Others considered the bus as more relaxing and comfortable since the driver is personally responsible for the safety of all passengers. As one senior stated: "You can sit back and let the driver worry about the driving". A couple of elderly individuals claimed that they enjoyed using the bus since they didn't have to depend on someone else with a busy schedule. Another commonly cited advantage of the bus was that it is more economical i.e. "costs less than using up gas for one's car". Finally, one elderly lady summed up her pleasure with public transit by stating: "You can see around in people's gardens; you can talk to people and see the children...I like the friendly things".

Although most of the respondents were aware of the HandyDART custom transit system, most assumed that it was exclusively for medical and health-related appointments. Some of the respondents commented that when they were "old" and incapable of getting around by car or bus, they would start using the HandyDART system. Many of them believed that such a transport system was indeed necessary for the municipality of Richmond, yet not for them personally.

The information revealed in the literature review on public transportation and the elderly advocates a demand-responsive type of transit system as best satisfying the needs of the elderly. Since this system provides a "hands-on" characteristic whereby drivers eagerly help the elderly on and off vehicles and supply flexible and personalized door-to-door service on demand, it provides the elderly with portal-to-portal services and the opportunity for self-determination. When the survey participants were asked whether they feel that some form of transportation catering exclusively to the elderly should be provided in Richmond, many of the respondents disagreed. Some strongly believed that such a system should be provided "only for really handicapped individuals, not for people who can get around". Other related comments were "such a system should be combined with disabled"; "should be both for elderly and infirm like HandyDART"; and "if people can't use the bus, they should be using HandyDART". Two respondents firmly stated that "we already have HandyDART available, and "HandyDART is enough". Finally, one individual reported, "we have too many things already labeled 'only for the elderly'; I like to see young people around too, not always the old".

The cost of such an exclusive service was also of obvious concern. One respondent stated that "there is just too much cost attached to something like that and no one would want to put out money for it", while another admitted that "although it would be beneficial, it's too costly; it couldn't be that frequent since cost would be extremely high - who'd pay for it".

6.5. Importance of Public Transportation Characteristics

6.5.1. Features of Regular Bus Transit

In terms of the characteristics listed in the section "Features of Regular Bus", most respondents felt that signs on the bus identifying where it is going are essential. A couple of individuals suggested that the signs be enlarged, while one individual claimed that the order of the number followed by destination should be reversed to the destination followed by the number of the bus (ie. Richmond - then #1 Road). B.C. Transit, however, has already improved the signs on the buses by condensing the information and enlarging the letters in order to help individuals with visual impairments. Measures such as these to assure readability and easy comprehensibility, therefore, have already been taken.

Most of the respondents regarded the distance to the bus stop as being a very important consideration. Some commented that they could walk within reason, while others firmly asserted that they had no trouble walking. A shelter at the bus stop was considered essential and very important. Relevant comments centered on "too much vandalism on shelters already", and the benefit of shelters as "protection from wind, rain, and storms". One individual wisely suggested that shelters are necessary only at main bus stops - "putting shelters at all bus stops would be much too expensive".

The number of transfers required to reach a desired destination was regarded as somewhat important to many of the respondents, while reserved seats for seniors appeared to be a controversial issue. A few respondents stated that "there's enough now; the young ones will always get up and give a seat", while a couple of individuals claimed more seats for seniors are needed since "kids don't give up a seat" and "some people, often young people, use elderly seats and never get up". These individuals stressed that if people don't give up their seats, the "bus driver should get up and tell them to give up their seats".

Although most people regarded frequency of service as very important, a few supplied the following comments: "I have lots of patience"; "my time is flexible"; "I don't work"; and "as long as I know it'll run on the hour, I can guage my travelling for that; I'm flexible". One elderly male wisely commented, "I realize buses can run only as often as they can be filled up".

When asked how important it was for the driver to announce each of the destinations, the majority felt it was either very important or somewhat important. One individual appeared offended by this proposed transit feature by boldly writing, "I know where I'm going", but others felt that it would be a good idea, especially in the dark and at major transfer points since lots of people don't know where they're going". Some respondents, however, felt that it should be the responsibility of the users themselves to ask the driver to let them know when they have reached their desired destination.

Finally, most of the elderly respondents believed that adherence to a printed schedule was either essential or very important within their "ideal public transportation system".

6.5.2. Features of a Personalized Transportation System

Many of the respondents who filled out the second section, "Features of a Personalized Transportation System", clarified that although some of the listed features may indeed be important, they were not applicable to themselves personally. One individual, falsely assuming that this section was related to the question dealing with the provision of an exclusive transportation system to Richmond elderly, claimed "If a person can't get on the bus by themselves, they should use HandyDART - you can't hold up 99% of the people for one person". Many people clarified their selection by commenting, "since I don't use a wheelchair, having a wheelchair tie-down would be

important only for those who need it". The particular "use of service exclusively by the elderly" feature was often clarified with "too expensive" or "we should be allowed to mingle with others".

The proportions in the "Not Important" and "No Response" categories for this section are relatively high in comparison to the other sections, possibly because many respondents sincerely felt that although "these special features may be important to the infirm or handicapped, at this stage in my life, they are not important to me". Generally, of those respondents who did attach some importance to these specific features, the choice of "somewhat important" appeared to be relatively consistent across the board.

One interesting comment which deserves mention is by a male respondent who strongly believed that a mechanical device would only cause more problems than it intended to solve since "mechanical devices on vans for the disabled have been breaking down mechanically in Seattle".

6.5.3. Vehicle and Service Features

Finally, under the section, "Vehicle and Service Features", most of the seniors who responded regarded heating and air conditioning within the vehicle as either essential or very important. A number of seniors, however, reported that since the windows on the bus can be opened, there is no need for air-conditioning. "It is too costly" they stated. Overall, a large number of the sample regarded the feature of a friendly and courteous driver as being essential in importance. A couple of seniors further elaborated upon their selection by adding, "most of the drivers around here are good".

In response to the importance of the number of steps required to board and exit the vehicle, most of the elderly surveyed regarded this feature as very important.

Some claimed that although the number of steps is important, "I can manage alright with what is there", while a couple of seniors stated that the steps should be lower - "the less of them, the better". The cost of the ride was judged to be almost equally "very important" and "somewhat important" for those seniors who responded to this feature. Elaborations included the following: "My concession fare card is great"; "the price is very reasonable"; "it's a little expensive but they have a big overhead"; and "65 cents is not too bad". One respondent made a point of adding "too high now", while another responded "it's fixed by the transit authorities so you can't do anything about it anyway".

Most of the elderly surveyed believed the courtesy demonstrated by other passengers to be very important. One lady, in particular, commented that "some are terribly rude", whereas a couple of other respondents stated that they've encountered "no problems; they've all been nice". The existence of evening public transportation service was regarded as "somewhat important" by the largest number. Some individuals claimed that since they did not go out in the evening, except for special occasions, they would never need evening service. Others reported that the service which is available in the evenings now is adequate, while one individual stated that the existence of evening service must balance with demand.

In regard to restricting the number of people on the vehicle to the exact number of seats, the largest number of respondents evaluated this restriction as being either "very important" or "somewhat important" (28.2% and 25.9% respectively). Many respondents clarified their response, however, by adding that such an action is impractical, and would be impossible to implement. One lady firmly declared that "B.C. Transit would never agree to that - what would happen during rush hour?" Two individuals who strongly believed that such an exercise would be beneficial added, "if everyone is required by law to wear a seatbelt in a car, why not on the bus?"; and "often the express buses are so overcrowded that the people standing are in danger".

Finally, a female respondent suggested limiting the number of people on the bus during school hours.

Visible Safety Features (eg. handrails, ample leg room, etc.) were regarded as both essential and very important by most of the respondents, while the size of the vehicle (eg. van-size, bus-size, car-size) was considered somewhat important by many of the elderly surveyed.

6.6. Final Comments

One of the most illuminating aspects of this study was the response to the final inquiry in the questionnaire: "Do you have any other comments to make regarding the transportation alternatives available to you within Richmond?" The answers to this question are of importance in that they reveal those transportation concerns that are of particular importance to the elderly Richmond residents surveyed. Within the context of this study, these comments can be taken as an indication of issues and/or concerns which have failed to be brought out through the particular questions in the questionnaire, yet are important enough to the respondent to be mentioned in the survey.

Of the total 85 respondents, only 36 chose to answer this final question. Answers ranged from a few words or sentences to a whole paragraph. The rather extensive number of responses can be summarized into 8 main areas of comments. For an illustration of all concerns raised, please see Table VIII. The 8 main areas of concern raised in this last question are as follows:

1. poor connections (ie. not enough bus routes running east-west)
2. experience with inconsiderate bus drivers
3. greater frequency of service
4. benches should be provided at bus stops

5. lack of other transportation alternatives in addition to public transit
6. HandyDART should be made more available
7. bus schedule should be posted on shelter or post for all to read
8. satisfaction/dissatisfaction with bus service in Richmond

The comments summarized above indicate that some of the 85 respondents have a wide range of needs and concerns. Not all comments expressed were negative and some attempted not just to state the problem, but also to offer solutions. Within the context of this study, it is important to note these comments for they allow emphasis to be placed on those aspects of the problem under investigation which require greater attention in the planning field. These comments also allow for a more readily understandable and coherent context within which transportation planners can function.

CHAPTER SEVEN

CONCLUSIONS AND PLANNING IMPLICATIONS

7.1. Conclusions

7.1.1. Demographic Characteristics

A portion of the literature review in this thesis has revealed certain demographic and age-specific characteristics of individuals 60 years old and over, with a particular emphasis on independent-living elderly in the suburbs. It has been found that the number of older people, particularly older females and seniors over 85 years of age, is increasing dramatically in Canada. This trend is evident not only in the major cities, but also in suburban metropolitan areas. Wade (1983) has noted that 70% of Canadian seniors share their home with another individual(s), 8% reside in institutional settings, while the remainder live alone. A large portion of the single-person elderly households are women; an assertion supported by the findings of the survey undertaken in this thesis. While slightly more than 85% of the male respondents sampled lived with their spouse, more than half of the female respondents were single and lived alone. This finding is further substantiated in a study carried out by the Richmond Planning Department (1982) in which 79.7% of the male respondents resided with someone else, whereas 43.4% of the female respondents lived by themselves.

Most of today's suburban elderly live in private housing (Wade, 1983), yet their particular living accommodations are quite diverse. A study of the elderly in Richmond disclosed that slightly more than half of the sample lived in a single-family home, with the second largest proportion residing in an apartment, followed by a smaller number of townhouse dwellers (Richmond Planning Department, 1982). Similarly, the Richmond seniors surveyed in this thesis were predominantly home owners, and apartment and

condominium dwellers. Although the majority of the respondents have lived in Richmond for more than a year, a sizeable number have aged-in-place with 41% living in the suburb 10 years or more.

Generally, most elderly between 60 to 75 years of age have no health-related limitations. In fact, Gombeski (1980) discovered that many elderly proudly report not experiencing any serious health-related mobility problems. The findings of the thesis survey have revealed a similar confident attitude. When the elderly were asked to report the frequency of encountering mobility difficulty in getting to where they wanted to go, close to half of the respondents claimed never experiencing such difficulty, while the other half reported only occasional problems.

The age of 75 years, however, has been targeted as a time of sustained and declining physical activity characteristics (Wade, 1983). Elderly individuals in this age category have been found to travel less, take shorter trips, and use automobiles less frequently than their younger counterparts. Furthermore, Gutkowski et al (1979) found that the lack of a vehicle becomes a major problem for suburbanites over 75 years of age, regardless of tenure status. The thesis survey findings confirm this gradual decline in mobility and motor vehicle use over the age of 75 years. A larger number of the late-elderly respondents reported experiencing mobility difficulty, even if only on an occasional basis. They also complained more of physically-taxing problems such as climbing into and out of the bus, and maintaining one's balance when forced to stand on a moving vehicle. Furthermore, the late-elderly respondents were less likely to own a car, and even though a relatively small number of the total sample (ie. 16.5%) reported difficulty in driving, a significant proportion of these individuals were 75 years of age or older.

7.1.2. Travel Patterns

The literature review has revealed that seniors enjoy visiting friends and relatives, and reading and watching television, yet they participate in recreation activities far less frequently than members of other age groups. Cohen et al (1980) disclosed the most important reasons for elderly travel to be grocery shopping, recreation, and other types of shopping. Religious, medical, and business travel combined barely accounted for more than 25% of the trips taken by any single mode. A large proportion of the Richmond seniors surveyed in this thesis reported travelling to the grocery store, senior centre, restaurant, and to visit friends at least once or twice a week. They travel to the bank, drugstore, post office, barber/beauty salon and to visit family once or twice a month, while visits to the doctor normally occur on a yearly basis. Although Wade (1983) discovered that the early-elderly (60-75 years) travel more than the late-elderly (75+ years), the thesis survey failed to provide support for this particular assertion.

Suburban elderly most frequently travel within the vicinity of their own neighborhood, although certain destinations entail travel outside of this sphere. Since only a selected number of stores, other facilities, friends, and possible points of contact are generally located nearby, the elderly must venture beyond their immediate neighborhood to reach further destinations (Carp, 1972). The results of the thesis survey clearly support this finding. Most of the destinations which the elderly respondents travel to (see Figure 14) are located within Richmond. Very few of them were reported to be within their immediate neighborhood. The particular trip purpose most frequently cited as requiring travel outside of the suburb of Richmond was visiting family members whose residences were quite geographically dispersed.

Since most elderly are no longer committed to rigid daily schedules, certain researchers (Cohen et al, 1980; Schmitt in Golant, 1979; Golant in Altman, 1984) have discovered that their travel is increasingly oriented to non-work trips and is more likely

to occur during non-peak working/commuting hours. This specific travel pattern was confirmed in the thesis survey, since with the exceptions of visiting friends and family, and going out to a restaurant, the majority of the respondents reported undertaking their daily errands and activities sometime between 9 am and 4 pm.

7.1.3. Mode of Travel

Mobility has been proven to play an important role in the elderly's quality of life (refer to pages 17-18). Transportation, a substantial factor in this mobility, is frequently unveiled as a significant problem. Although women and low-income elderly experience the greatest difficulty in getting about, elderly living in the suburbs also encounter significant mobility problems, partially as a result of non-existent, inefficient, or ineffective transportation alternatives.

Findings from the thesis survey reveal many of the elderly respondents to be heavily dependent on their own vehicles, largely because of the convenience and flexibility that this particular mode provides. Almost 60% of the respondents use their own car as their primary mode of transportation, while the remainder rely upon the bus, walking, or a ride with someone else in order to satisfy their daily transportation needs. Slightly more than 70% of the respondents, and only 43% of their spouses, possess a valid driver's license. Seventy-three percent of the sample reported owning at least one currently licensed motor vehicle. This figure is in line with the results of other studies which find automobile ownership for the elderly, especially in suburban areas, to be relatively high. Specifically, Wade (1983) found the rate of car ownership for seniors residing in urban settings to be 75%, while 68.8% of the elderly surveyed by the Richmond Planning Department (1982) reported owning a vehicle.

In his research, Wade (1983) discovered that late-elderly individuals demonstrate less use of automobiles. Furthermore, individuals over 75 years of age are more

dependent upon public transportation than their younger counterparts. As age increases, there is a tendency to become more dependent on others for transportation because of a physical inability to drive oneself, pass the driver's test, afford automobile insurance or the cost and maintenance of an automobile (Wachs et al, 1975). Results of the thesis survey support the first finding. The early-elderly individuals surveyed were more likely than the late-elderly to use their own car as their primary mode of transportation. Furthermore, a greater proportion of the early-elderly respondents, and a significantly larger number of their spouses, reported possessing a valid driver's license (refer to figures 30 and 31). Respondents in both age categories received rides with someone just as frequently, while the late-elderly respondents walked to their particular destinations more often.

7.1.4. Transit Bus Use and Suggested Changes

The literature review has revealed that certain elderly may be heavily dependent upon public transportation, especially when there is no alternate mode of transport available. Senior women appear to use public transportation more frequently than elderly men (Ontario Study, 1985), although many studies show that overall, relatively few elderly actually use the bus. The thesis survey revealed no significant difference in the use of public transit between early and late-elderly; respondents in both age categories reported using the bus just as frequently. Overall, however, a little over half of the sample used the regular transit service in Richmond. Forty-six percent of these bus-users used the service only a few times a year, while 27.1% used it once or twice a month. Nineteen percent used the bus once or twice a week, while only a relatively small 8.3% used it on a daily basis. Other studies of seniors reveal similar findings on elderly bus-use. For example, research undertaken in Ontario (1985) revealed that 50% of the total sample used public transportation. Carstenson (in Waddell, 1976) found that over 60% of the elderly in his sample used bus services on

certain occasions, most often for shopping and visits to doctors or dentists, than for any other trip purpose. A study undertaken by the Richmond Planning Department (1982), however, estimated that at most, only 25 persons out of 135 surveyed, regularly used the bus as a mode of transportation.

Carstenson (in Waddell, 1976) found that most elderly users ride the bus no more than two days per week, and the majority of bus trips taken occur between 11 am and 4 pm. The elderly respondents surveyed in this thesis normally used Richmond's bus service sometime between 9 am and 4 pm. Slightly over half of the sample reported travelling on the bus outside of Richmond on an occasional basis; the most frequent destination being downtown Vancouver. Over a quarter of the respondents, however, reported never having used the bus to venture outside of Richmond.

As a special population group, the elderly encounter a number of functional and psychological barriers to the use of public transit (refer to page 40). These problems range from difficulties getting on and off the bus and keeping one's balance while riding, to waiting at the bus stop and the fear of getting lost. A number of innovative suggestions to improve existing public transit systems have been raised in studies on the elderly (refer to page 43). Some of these suggestions include the following: more bus shelters with seats; raising the sidewalk or platform at bus stops in order to reduce the height of the step into the bus; more frequent bus service; and the addition of railings and handholds. Table V lists specific suggested improvements to Richmond's transit system revealed by the respondents of the thesis survey. One particular suggestion which deserves mention due to its frequent recurrence is the desire for more east-west bus service throughout Richmond. Many of the vehicle-owners surveyed, however, appeared to feel that even if the existing public transit system was to be modified based on some of their suggestions, they would continue to use their own car as long as possible. The study's hypothesis (refer to page 3), therefore, has

been proven false by this particular finding.

7.1.5. Demand-Responsive Transit Systems

The literature review has depicted demand-responsive transit systems to be the most efficient transportation alternatives for the elderly. These custom transit systems possess a hands-on characteristic whereby the elderly are helped in getting on and off the vehicle. The benefits of such a system for the elderly are the following: the opportunity for self-determination; freedom from imposed limitations; and provision of portal-to-portal services. Wiseman (1976) found the trip frequencies of elderly users of these systems to be significantly higher than similar subgroups of the elderly population who did not use the service. Furthermore, the use of volunteers within such a system has been found to be very cost effective (refer to pages 46-47).

In Richmond and throughout the GVRD, B.C. Transit administers a custom transit service known as HandyDART for those unable to use conventional transit. The thesis survey revealed that 88% of the respondents have never used HandyDART, while only 61.2% of them are in fact aware of the service. Although almost half of the respondents favoured the existence of a transportation service in Richmond catering exclusively to seniors, 37% of the sample felt that such a service would be unnecessary, while the remainder were undecided. Most of the respondents favoring such a service, however, would be willing to pay either the same as regular bus fare or 50 cents more than the regular fare, whereas only 16% were willing to pay a full dollar more than the regular fare for such an exclusive service.

Many of the respondents claiming that such an exclusive transport service was not essential were still quite capable of using either their own vehicle or the public transit system along with other members of the population. They did not wish to be excluded from others since they failed to perceive themselves as a special population

group. Some of them claimed, however, that once they were no longer capable of travelling on their own, they would certainly use the existing handyDART custom transit system.

7.1.6. Strategies to Improve Senior Mobility

The literature review revealed three potential strategies to help improve the mobility of the elderly. The first strategy suggested implementing changes within the existing fixed-route public transit system; the second considered the provision of a demand-responsive transportation system outside of regular transit, while the third strategy involved reducing the travel requirements of the elderly by insuring that their residence was located either within walking distance of the nearest bus stop or close to their most frequented destinations. An analysis of these strategies based on information in the literature review resulted in the determination of a "recommended" solution to satisfy the transportation needs of suburban elderly. This solution recommended the existence of demand-responsive transit in addition to a fixed-route bus system. The co-existence of these systems would ensure that the transport needs of the elderly, along with those of the rest of the population, were being satisfied. Results of the subsequent thesis survey and study area profile, however, forced the following reexamination.

In regard to the first strategy, results of the thesis survey clearly identified certain problems with the fixed-route transit system in Richmond. For example, many respondents claimed the number of buses running east to west throughout Richmond is insufficient. They complained of poor frequency, long waits, and having to transfer too often. Others claimed that east-west bus service along some of the major streets was non-existent. Problems such as this inevitably require further study in order to determine whether increased service on routes running east to west within Richmond would indeed prove beneficial. Certain measures to help solve some of the other public

transit problems reported by the elderly respondents, however, could be undertaken immediately. For example, a couple of respondents claimed that the bus driver takes off too quickly causing the bus to jerk and the elderly individual to fall. A memo could be distributed to all bus drivers reminding them of the physical capabilities and limitations of seniors in the hope that this short reminder would cause each employee to think before acting.

Strategy two advocates the establishment of a special-purpose system outside of regular fixed-route transit. Findings from the thesis survey, however, have revealed that the provision of a demand-responsive transit system within Richmond catering exclusively to elderly residents is not viable for the following three reasons:

1. The seniors who responded positively to such a service were evidently not willing to pay enough as users to make such a service financially viable.
2. The seniors who responded negatively believed they were still quite capable of using the same transport systems employed by everyone else; they did not wish to be regarded as a special and unique group requiring door-to-door transit service.
3. Richmond already has a custom transit service (ie. HandyDART) which may not be exclusive to seniors, but nevertheless provides service to all individuals unable to use conventional transit.

The "recommended" solution advocating the coexistence of a demand-responsive system and a fixed-route transit system is essentially already in existence. The HandyDART custom transit service appears to be sufficient in satisfying the needs of those elderly incapable of using the regular bus or driving a car, while B.C. Transit satisfies the needs of seniors who may not own a car, dislike driving, or have no one to rely upon for regular rides.

In regard to the third and final strategy, it was found that the respondents experiencing the least amount of problems with their ability to get where they wanted to go were those individuals residing relatively close to a public transit bus route or

the Town Centre of Richmond. They seemed satisfied with their choice of residential location since they lived either relatively close to the main commercial, professional, and recreational core of Richmond or could gain access to it very easily. Respondents residing further away from the Town Centre and the nearest bus stop reported the greatest number of mobility difficulties. The large expanses necessary to travel across in order to get from one location to another in the suburb of Richmond, however, did not appear to pose a problem for most of those respondents who possessed and used their own car. Respondents who were forced to rely upon other modes of transportation, however, experienced a certain amount of difficulty in getting about.

7.2. Planning Implications

The rapid growth rate of the elderly in suburban areas indicates that the transportation needs of these individuals will only increase in importance. It is evident both from the literature review and the thesis survey that the travel patterns and mobility constraints of the elderly differ from those of their younger counterparts. The nature of these differences alone makes the study of seniors and their transportation needs very important. Specific research on this topic, however, is crucial to gaining an understanding of the elderly's transportation problems so that some of these difficulties can eventually be eliminated, or at least alleviated, through proper planning.

The specific findings of this thesis will help the planner understand the nature of the transportation needs, travel patterns, and public transportation expectations of suburban independent-living elderly. Furthermore, it provides the planner with the attitudes of some of Richmond's seniors toward their present transport alternatives. This information will enable the planner to identify potential modifications and/or alterations to existing transportation systems in order to effect appropriate changes so that the modified transport systems become more convenient to the elderly.

Although some of the public transportation problems experienced by Richmond's independent-living elderly may be age specific, in essence, most of the transportation difficulties reported in the survey would not be expected to differ substantially from the views of other Richmond residents. Ultimately, therefore, the goal is to arrive at an efficient and effective public transportation system which serves the needs of both the elderly in Richmond, along with the rest of the suburban population.

The question the suburban transportation planner will inevitably pose is "What have we learned in this study about the transportation needs of the elderly that can aid planners in making decisions affecting this group?" In answer to this question, the most significant planning implications of the study's findings will now be discussed.

7.2.1. Demographics

It has been revealed that a substantially larger proportion of elderly females than senior males live alone. Since many of these females have matured in an era when driving was mainly the responsibility of males, it is not surprising that elderly women use public transportation more frequently than men. Population projections consistently reveal that the number of older people in Canada is increasing, with the growth of older females and seniors over 85 years of age surging the most. Consequently, it can be expected that dependence upon public transportation by increasing numbers of suburban elderly females will become much greater in the future. Planners must begin now to plan for the transportation needs of this large population group in order to ensure that these older suburban females will avoid social isolation.

The dramatic growth rate of the late-elderly age category also signals an inevitable occurrence. It has been found that individuals over 75 years of age encounter extreme rates of hearing, visual, and mechanical disability. In consequence, they experience more problems driving a car, and develop greater dependence upon

public transportation than their younger counterparts. Many of these individuals are either fully-ambulatory or semi-ambulatory, and thus quite capable of using existing fixed-route public transit systems. As one ages, however, it is inevitable that certain physiological changes occur which affect mobility. Consequently, it can be expected that a number of these late-elderly individuals will become increasingly incapable of using the conventional transit system. As a result, their dependence upon the HandyDART custom-transit service will increase. Unfortunately, however, the Richmond fleet of HandyDART buses is only just meeting existing demand (refer to page 65). This projected growth of suburban late-elderly individuals, therefore, signals the need for a cost/benefit analysis of a potential HandyDART fleet expansion in the future.

7.2.2. Travel Habits

This thesis has concluded that suburban elderly residents travel most often within their own suburb; few destinations entail travel outside of this sphere. Generally, most of the daily errands and activities carried out by these individuals take place sometime between 9 am and 4 pm. Transportation planners and transit administrators, however, orient system planning and system design primarily toward satisfying the travel patterns of an able-bodied constituency, whose travel destinations are largely to work during peak-hour times of the day. It is not surprising, therefore, that the elderly respondents did not report any problems with the number of express buses running north to south within Richmond (eg. the bus to downtown Vancouver along No. 3 Road), yet many complained of the relative deficiency in transit service on main streets running east to west. Further study is necessary in order to determine whether this particular dissatisfaction exists among other transit users as well.

The thesis also discovered that elderly do not particularly enjoy travelling in the evening, whether in their own vehicle or by public transit. When they venture out to visit family or go to a restaurant, a ride with someone else is generally accepted.

Consequently, transit planners should be aware of this significant decline in evening bus-use by the elderly.

7.2.3. Mode of Travel

The results of the thesis survey and other studies carried out on the elderly reveal the importance of private transportation to seniors residing in the suburbs. Although, in general, car ownership figures for the elderly are relatively high, planners must keep in mind that as this survey revealed, a significantly larger proportion of individuals in the early-elderly age category, compared to those in the late-elderly category, own a vehicle. Since the largest and fastest growing subpopulation of elderly are 75 years old and over, it can be expected that in the future, there will be a greater number of older individuals without cars and in need of public transportation. As previously discussed, this increase in the late-elderly transit-captive clientele will increase the demand upon both the regular fixed-route transit system and the HandyDART custom-transit service. The consequences of this increased demand on each of these transportation systems must be analyzed so that eventual expansions can be implemented with few disruptions to the system itself or its regular users.

7.2.4. Public Transit and the Elderly

As the results of this thesis revealed, the convenience and comfort experienced by elderly car-owners far outweighs the advantages of the existing public transit system. In order to make the bus-riding experience more pleasurable for the elderly, and possibly increase their use of transit, certain improvements to the transit system recommended by the elderly themselves should be considered by transportation planners. Some of the proposed suggestions, however, would require substantial capital outlays, and subsequently, greater operating costs. Such costly improvements must be analyzed

further in order to determine whether the specific problem is being experienced by other suburban population groups as well. Subsequently, further research, such as feasibility, demand-supply studies could be undertaken to determine how much of the cost of the proposed improvement could be covered by user fees and how much would have to come from the three levels of government. Solutions to other complaints, however, such as the bus driver taking off too quickly, could be implemented in a less costly manner. Certain minor changes, therefore, are indeed possible in order to better the on-board transit environment of the elderly.

Ultimately, however, transit planners must keep in mind that many elderly, especially car-owners, will continue to drive a car as long as possible regardless of any modifications to existing transit systems. Consequently, attempts to change existing systems with the sole objective of increasing elderly bus-use may prove to be largely unsuccessful.

7.2.5. Demand-Responsive Transit Systems

Since the thesis survey findings have ruled out the establishment of an exclusive demand-responsive transit system catering exclusively to the elderly of Richmond, the attention of transportation planners must shift to the existing handyDART transit system. Many of the elderly surveyed obviously prefer to use their own vehicle, thus for now, the handyDART transit service appears to be sufficient in satisfying the needs of those elderly incapable of using the regular bus or driving a car.

Some of the elderly surveyed, however, mentioned that once they were no longer capable of travelling on their own, they would definitely take advantage of the handyDART service. This resurfaces the expected future increase in demand upon handyDART custom transit by suburban elderly. Potential expansion strategies for handyDART in Richmond, and possibly a number of other suburbs, must be considered

in order to ensure that the transportation needs of future elderly will be satisfied.

7.3. Long-Range Planning Implications

Up to this point, the question of public transportation for suburban elderly has been viewed from the perspective of the transit planner whose concern is focused on the immediate and direct implications that may be derived from this study. However, there is also a role for planning on a different plane; a role which must attempt to stand back from the immediate planning problems. In this thesis, this type of planning will ask the question: "How can elderly people moving into a suburban area be advised to relocate within the optimal residential locations in terms of proximity to available transportation services and facilities?" It is clear that the elderly experiencing the least amount of problems with their transportation alternatives and travel patterns are those individuals living relatively close to a public transit bus route.

The role of the planner, therefore, becomes increasingly more complex. Not only must the transportation planner consider potential modifications to current transit systems, but he/she may also be called upon to examine the implications of possible elderly suburban relocation policies ensuring transportation access. He/she must recognize the needs of the elderly and their concerns with transportation in order to ensure that the elderly of today and the large number expected in the future are capable of carrying out daily activities through the use of pleasant and convenient modes of transportation.

It is only by whole heartedly accepting and working within this expanded long-range framework, that the planner can make truly wise decisions regarding the public transportation needs of suburban elderly.

7.4. Suggestions for Further Research

Further research would be required to reveal the following:

1. Influence of Elderly Survey Location: Whether the fact that the thesis survey was administered at two senior centres and with a church activity group in Richmond resulted in the 85 respondents being much more active and less public transportation-dependent than similar independent-living elderly respondents would be if approached within the confines of their own home. The assumption here is that the elderly who visit senior centres are more agile and mobile, and thus encounter fewer transportation difficulties than many of the seniors restricted to their homes.
2. Transportation as it relates to Seniors' Income: More research should be undertaken on how the travel habits and transportation modes employed by the elderly vary between seniors in different socio-economic groups. Unfortunately, the survey undertaken in this thesis received a very poor response rate to the inquiry asking for the respondents' total 1987 household income. In consequence, socio-economic comparisons in travel habits, car ownership rates, or public transit use could not be pursued.
3. Concentration upon Elderly Bus-Users: Since the study undertaken in this thesis concentrated upon both elderly bus-users and non-users, the resultant findings concerned with the transit system are based upon a small number of individuals who use the bus regularly, and a larger number who use it only a few times a year. A study concentrating only upon regular bus users would likely reveal more precise information and various insights, along with problems and suggested improvements to the local bus system in Richmond, in order to make the service more convenient and pleasant.
4. Demand/Supply Feasibility Study on east-west transit service in Richmond: Many of the elderly surveyed complained that there were not enough buses running east to west on the major routes throughout Richmond. Furthermore, some of these

major routes, such as Francis Road for instance, did not have bus service at all. One can assume, therefore, that this problem is also encountered by other bus-users within Richmond as well. A demand/supply feasibility study designed to reveal whether more bus service on east-west routes is indeed required would be helpful.

Since the number of older people is increasing dramatically in Canada, and the unique transportation problems encountered by this age group are constantly resurfacing in studies of the elderly, more research on all aspects of the elderly and their transportation needs is required. Finally, since there is a strong trend expected over the next twenty years of a shift of seniors to suburban locations, the transportation and mobility needs of these persons in particular must be thoroughly examined.

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APPENDICES

APPENDIX A

handyDART ELIGIBILITY VERIFICATION FORM

handyDART is a special door-to-door transit service for disabled persons who are unable to use the regular fixed-route transit system. Eligibility is defined by provincial order-in-council. - The overriding guideline is a physical or mental disability that prevents an individual from using conventional public transit.

The following guidelines will assist in determining if an individual is eligible for handyDART service.

Neurologically-Related Disabilities

Examples: Cerebral palsy, mental retardation, senility or conditions of a similar nature.

- Unable to understand and follow transit directions (does not include foreign language difficulties).
- Easily confused or disoriented so that the person is unable to travel safely on public transit.

Locomotor-Related Disabilities

Examples: Arthritis, limb loss, multiple sclerosis or conditions of a similar nature.

- Unable to walk from home to the nearest bus stop.
- Unable to negotiate stairs or ramps.
- Unable to board or alight from a bus.

Sensory-Related Disability

Example: Visual impairment

- Unable to use public transit because of visual impairment.

Medical Conditions

Example: Heart conditions, respiratory problems, epilepsy of a nature not easily controlled by drugs, or conditions of a similar nature.

- A diagnosed medical condition that does not allow travel on a conventional bus.
- A diagnosed medical condition that does not allow movement from a residence to the nearest bus stop.

If an individual meets any of these criteria and needs to use handyDART, he or she should complete the other side of this form. The verification section should be completed by a senior official of a recognized social service or health agency (for example, a public health nurse, long term care administrator, medical specialist or family doctor).

APPLICANT INFORMATION

Name of Applicant: _____

Street _____ Apt. No. _____

City _____ Postal Code _____

Telephone _____ Date of Birth _____

Do you use a wheelchair? Yes ___ No ___ Other Aids: Cane ___

Walker ___ Crutches ___ Other (Specify) _____

I hereby authorize BC Transit and the handyDART operating company to determine my eligibility for handyDART service and, if necessary, to consult the social service or health agency representative, medical specialist, or family doctor named below. I understand and agree that the decision of BC Transit and the handyDART operating company shall be final.

(Signature of Applicant)

VERIFICATION OF ELIGIBILITY FOR handyDART

This section is to be completed by a senior official of a recognized health or social service agency or by the applicant's medical specialist or family doctor. Before completing this verification, please refer to the guidelines for eligibility on the reverse side of this form. handyDART's resources are limited, and it is important that the service be directed only to those who must depend on it for essential transportation. Your co-operation is appreciated.

I hereby verify that _____ is disabled
(name of applicant)
and meets the eligibility criteria for handyDART service.

Nature of disability: _____

Official's Name: _____

Position: _____ Organization: _____

Address: _____ Telephone: _____

City: _____ Postal Code: _____

(Date)

(Signature of Official)

Please return this completed form to:

APPENDIX B

SENIOR TRANSPORTATION QUESTIONNAIRE

1. WHAT MODE OF TRANSPORTATION DO YOU USE MOST OFTEN TO GET WHERE YOU WANT TO GO?

- regular bus
- handyDART
- Richmond Community Leisure Transportation
- drive yourself
- ride with someone
- walk
- taxi
- other _____

2. DO YOU TRAVEL TO ANY OF THE FOLLOWING DESTINATIONS?

	<u>NO</u>	<u>YES</u>
a) grocery store	_____	_____
b) drugstore	_____	_____
c) doctor's office	_____	_____
d) bank	_____	_____
e) post office	_____	_____
f) restaurant	_____	_____
g) barber/beauty salon	_____	_____
h) senior centre	_____	_____
i) visit friend(s)	_____	_____
j) visit family	_____	_____

3. HOW OFTEN DO YOU TRAVEL TO THE FOLLOWING DESTINATIONS?
(Please circle desired choice)

a) grocery store	1	2	3	4	<u>Choices:</u> 1= Daily 2= Once or twice a week 3= Once or twice a month 4= A few times a year
b) drugstore	1	2	3	4	
c) doctor's office	1	2	3	4	
d) bank	1	2	3	4	
e) post office	1	2	3	4	
f) restaurant	1	2	3	4	
g) barber/beauty salon	1	2	3	4	
h) senior centre	1	2	3	4	
i) visit friend(s)	1	2	3	4	
j) visit family	1	2	3	4	

4. WHERE ARE THE FOLLOWING DESTINATIONS TO WHICH YOU TRAVEL MOST OFTEN LOCATED? (Please circle desired choice)

a) grocery store	1	2	3	4	<u>Choices:</u> 1= immediate neighborhood 2= within Richmond 3= in Vancouver 4= Somewhere in the Lower Mainland (Please specify)
b) drugstore	1	2	3	4	
c) doctor's office	1	2	3	4	
d) bank	1	2	3	4	
e) post office	1	2	3	4	
f) restaurant	1	2	3	4	
g) barber/beauty salon	1	2	3	4	
h) senior centre	1	2	3	4	
i) visit friend(s)	1	2	3	4	
j) visit family	1	2	3	4	

5. BETWEEN WHAT TIME OF THE DAY DO YOU NORMALLY TRAVEL TO THE FOLLOWING DESTINATIONS? (Please circle desired choice)

- | | | | | | | | |
|------------------------|---|---|---|---|---|---|--|
| a) grocery store | 1 | 2 | 3 | 4 | 5 | 6 | <u>Choices:</u>
1= before 7 AM
2= 7 AM - 9 AM
3= 9 AM - Noon
4= Noon - 4 PM
5= 4 PM - 6 PM
6= after 6 PM |
| b) drugstore | 1 | 2 | 3 | 4 | 5 | 6 | |
| c) doctor's office | 1 | 2 | 3 | 4 | 5 | 6 | |
| d) bank | 1 | 2 | 3 | 4 | 5 | 6 | |
| e) post office | 1 | 2 | 3 | 4 | 5 | 6 | |
| f) restaurant | 1 | 2 | 3 | 4 | 5 | 6 | |
| g) barber/beauty salon | 1 | 2 | 3 | 4 | 5 | 6 | |
| h) senior centre | 1 | 2 | 3 | 4 | 5 | 6 | |
| i) visit friend(s) | 1 | 2 | 3 | 4 | 5 | 6 | |
| j) visit family | 1 | 2 | 3 | 4 | 5 | 6 | |

6. WHAT FORM OF TRANSPORTATION DO YOU USE TO GET TO THE FOLLOWING DESTINATIONS? (Please write number in blank)

- | | | |
|------------------------|-----|--|
| a) grocery store | ___ | <u>Choices:</u>
1= regular bus
2= handyDART
3= Richmond Community
Leisure Transportation
4= drive yourself
5= ride with someone
6= walk
7= taxi
8= other (please specify) |
| b) drugstore | ___ | |
| c) doctor's office | ___ | |
| d) bank | ___ | |
| e) post office | ___ | |
| f) restaurant | ___ | |
| g) barber/beauty salon | ___ | |
| h) senior centre | ___ | |
| i) visit friend(s) | ___ | |
| j) visit family | ___ | |

7. DO YOU HAVE ANY DIFFICULTY GETTING TO WHERE YOU WANT TO GO?

- ___ never
___ occasionally
___ fairly often
___ very often

8. WHICH ONE OF THE FOLLOWING ARE MOST OFTEN THE DIFFICULTIES IN GETTING WHERE YOU WANT TO GO?

- ___ don't like to drive myself
___ no bus line nearby
___ don't like riding the bus
___ have trouble walking to bus stop
___ have trouble getting in and out of bus
___ can't afford a taxi cab
___ other _____

9. DO YOU OR YOUR SPOUSE HAVE A CURRENTLY VALID DRIVER'S LICENSE?

- | | | |
|--------|--------|---------|
| Self | ___ No | ___ Yes |
| Spouse | ___ No | ___ Yes |

10. DO YOU OR YOUR SPOUSE OWN AT LEAST ONE CURRENTLY LICENSED MOTOR VEHICLE?

No Yes

11. DO YOU OR YOUR SPOUSE HAVE ANY PROBLEM DRIVING A CAR?

No Yes

12. ARE THERE ANY PARTICULAR CIRCUMSTANCES OR TIME OF DAY WHEN YOU WOULD PREFER TO TAKE A BUS RATHER THAN USE A CAR?

No

Yes, please specify _____

13. DO YOU USE THE REGULAR BUS SERVICE IN RICHMOND?

Yes No, Why not? _____

14. IF YOU USE THE REGULAR BUS SYSTEM IN RICHMOND:

a) HOW OFTEN DO YOU USE THE BUS?

- daily
 once or twice a week
 once or twice a month
 a few times a year

b) DURING WHAT TIME OF THE DAY DO YOU NORMALLY USE THE BUS?

- before 7 AM
 7 AM - 9 AM
 9 AM - Noon
 Noon - 4 PM
 4 PM - 6 PM
 after 6 PM

c) WHAT PROBLEMS DO YOU ENCOUNTER IN USING THE BUS?

- walking to nearest bus stop
- having to transfer too often
- getting into and out of the bus
- having to stand in the bus
- unfriendly driver
- no problems
- other _____

d) WHAT ADVANTAGES CAN YOU SEE IN USING THE BUS AS OPPOSED TO A PRIVATE AUTOMOBILE? _____

15. HOW FREQUENTLY DO YOU TRAVEL ON THE BUS OUTSIDE OF RICHMOND?

- never
- occasionally
- fairly often
- very often

16. DOES THE EXTRA FARE FOR GOING OUTSIDE OF RICHMOND POSE A PROBLEM FOR YOU?

- No Yes

17. WHAT IMPROVEMENTS TO THE BUS SYSTEM WOULD PERSUADE YOU TO USE THE BUS MORE OFTEN? _____

18. HAVE YOU EVER USED THE HANDYDART TRANSPORTATION SERVICE OPERATED BY THE VANCOUVER HOME SUPPORT SOCIETY?

- No Yes

a) IF NO, ARE YOU AWARE OF THE HANDYDART SERVICE? ___ No ___ Yes

b) IF YES, HOW OFTEN DO YOU USE THE HANDYDART SERVICE?

- ___ daily
- ___ once or twice a week
- ___ once or twice a month
- ___ a few times a year

c) FOR WHAT PURPOSE DO YOU USE THE HANDYDART SERVICE? _____

19. HAVE YOU EVER USED THE COMMUNITY LEISURE TRANSPORTATION SERVICE FOR COMMUNITY GROUPS IN RICHMOND?

___ No ___ Yes

a) IF NO, ARE YOU AWARE OF THE SERVICE? ___ No ___ Yes

20. DO YOU FEEL THAT SOME FORM OF TRANSPORTATION FOR ALL KINDS OF TRIPS CATERING EXCLUSIVELY TO THE ELDERLY SHOULD BE PROVIDED IN RICHMOND?

___ No ___ Yes

a) IF YES, HOW MUCH WOULD YOU BE WILLING TO PAY PER RIDE FOR SUCH AN EXCLUSIVE SERVICE?

- ___ same as regular bus
- ___ 50 cents more than regular bus
- ___ \$1.00 more than regular bus
- ___ more than a \$1.00 greater than regular bus

21. FINALLY, I'D LIKE YOU TO ENVISION A PUBLIC TRANSPORTATION SYSTEM WHICH WOULD BEST SATISFY THE TRAVEL NEEDS OF OLDER PEOPLE LIKE YOURSELF. HOW IMPORTANT DO YOU CONSIDER THE FOLLOWING CHARACTERISTICS WITHIN SUCH A SYSTEM?

	ESSENTIAL	VERY	SOMEWHAT	NOT IM-
		IMPORTANT	IMPORTANT	PORTANT

(A) FEATURES OF REGULAR BUS

a) SIGNS ON THE BUS IDENTIFYING WHERE IT IS GOING

b) DISTANCE TO THE BUS STOP

	ESSENTIAL	VERY IMPORTANT	SOMEWHAT IMPORTANT	NOT IMPORTANT
c) SHELTER AT THE BUS STOP	_____	_____	_____	_____
d) NUMBER OF TRANSFERS REQUIRED TO REACH DESIRED DESTINATION	_____	_____	_____	_____
e) RESERVED SEATS FOR SENIORS	_____	_____	_____	_____
f) FREQUENCY OF SERVICE	_____	_____	_____	_____
g) HAVING THE DRIVER ANNOUNCE EACH DESTINATION	_____	_____	_____	_____
h) ADHERENCE TO PRINTED SCHEDULE	_____	_____	_____	_____

	ESSENTIAL	VERY IMPORTANT	SOMEWHAT IMPORTANT	NOT IMPORTANT
<u>B) FEATURES OF A PERSONALIZED TRANSPORTATION SYSTEM</u>				
a) STORAGE SPACE FOR PACKAGES	_____	_____	_____	_____
b) MAKING RESERVATION IN ADVANCE IN ORDER TO BOOK A SEAT	_____	_____	_____	_____
c) USE OF SERVICE EXCLUSIVELY BY THE ELDERLY	_____	_____	_____	_____
d) WEEKEND SERVICE	_____	_____	_____	_____
e) ASSISTANCE FROM DRIVER IN GETTING IN AND OUT OF VEHICLE	_____	_____	_____	_____
f) HAVING A MECHANICAL DEVICE (EG. RAMP LIFT) IN ORDER TO ELIMINATE THE USE OF STEPS	_____	_____	_____	_____
g) HAVING A WHEELCHAIR TIE-DOWN ON THE VEHICLE	_____	_____	_____	_____
h) PICK-UP AND DROP-OFF AT PLACE OF RESIDENCE	_____	_____	_____	_____
<u>C. FEATURES IN A VEHICLE</u>				
a) HEATING AND AIR CONDITIONING WITHIN THE VEHICLE	_____	_____	_____	_____
b) FRIENDLY AND COURTEOUS DRIVER	_____	_____	_____	_____

	ESSENTIAL	VERY IMPORTANT	SOMEWHAT IMPORTANT	NOT IMPORTANT
c) NUMBER OF STEPS REQUIRED TO BOARD AND EXIT THE VEHICLE	_____	_____	_____	_____
d) COST OF THE RIDE	_____	_____	_____	_____
e) COURTESY OF OTHER PASSENGERS	_____	_____	_____	_____
f) EVENING SERVICE (AFTER 6 PM)	_____	_____	_____	_____
g) LIMITING THE NUMBER OF PEOPLE ON THE VEHICLE TO THE EXACT NUMBER OF SEATS	_____	_____	_____	_____
h) VISIBLE SAFETY FEATURES (EG. HANDRAILS, AMPLE LEG ROOM)	_____	_____	_____	_____
i) SIZE OF THE VEHICLE (EG. VAN-SIZE, BUS-SIZE, CAR-SIZE)	_____	_____	_____	_____

DEMOGRAPHIC DATA

22. WHAT IS YOUR SEX? _____ Male _____ Female
23. WHAT WAS YOUR AGE ON YOUR LAST BIRTHDAY? _____
24. WHAT IS YOUR PRESENT MARITAL STATUS?
- _____ married and living with spouse
- _____ living alone
25. WHERE DO YOU LIVE WITHIN RICHMOND? (CLOSEST INTERSECTION OF TWO NEARBY STREETS) _____
26. HOW LONG HAVE YOU LIVED AT YOUR CURRENT ADDRESS? _____
27. WHAT TYPE OF RESIDENCE DO YOU LIVE IN?
- _____ a house you own or are buying
- _____ a house you are renting
- _____ seniors' public housing
- _____ an apartment
- _____ a condominium or co-op
- _____ mobile home
- _____ other _____

APPENDIX C

TABLE 4
AGE OF RESPONDENTS
 Richmond, B.C. (1988)
 N = 85

AGE CATEGORY	NUMBER	PERCENTAGE
60 - 64	7	8.2
65 - 74	36	42.4
75 - 79	23	27.1
80 - 84	15	17.6
85 - 89	4	4.7
90+	0	0.0
TOTAL:	85	100.0

TABLE 5
SEX DISTRIBUTION OF RESPONDENTS
 Richmond, B.C. (1988)
 N = 85

SEX	NUMBER	PERCENTAGE
MALE	33	38.8
FEMALE	52	61.2
TOTAL:	85	100.0

TABLE 6
LIVING ARRANGEMENTS OF RESPONDENTS
 Richmond, B.C. (1988)
 N = 85

LIVING ARRANGEMENT	NUMBER	PERCENTAGE
Married (With Spouse)	51	60.0
Living Alone	34	40.0
TOTAL:	85	100.0

TABLE 7
SEX DISTRIBUTION BY LIVING ARRANGEMENT
 Richmond, B.C. (1988)
 N = 85

LIVING ARRANGEMENT	MALE		FEMALE	
	NO.	%	NO.	%
Married With Spouse	29	87.9	22	42.3
Living Alone	4	12.1	30	57.7
TOTALS:	33	100.0	52	100.0

TABLE 8
TYPE OF ACCOMMODATION OF RESPONDENTS
 Richmond, B.C. (1988)
 N = 85

TYPE OF ACCOMMODATION	NUMBER	PERCENTAGE
House (owner)	33	38.8
House (tenant)	3	3.5
Senior Housing	4	4.7
Apartment	21	24.7
Condominium	18	21.2
Townhouse/Duplex	2	2.4
No Response	4	4.7
TOTAL:	85	100.0

TABLE 9
LENGTH OF RESIDENCE AT PRESENT ADDRESS
 Richmond, B.C. (1988)
 N = 85

LENGTH OF RESIDENCE	NUMBER	PERCENTAGE
Under 1 year	9	10.6
1 - 3 years	16	18.8
4 - 9 years	18	21.2
10 - 20 years	19	22.4
Over 20 years	16	18.8
No Response	7	8.2
TOTAL:	85	100.0

TABLE 10
INCOME OF RESPONDENTS
 Richmond B.C. (1988)
 N = 85

INCOME CATEGORY	NUMBER	PERCENTAGE
Under \$8,000	11	12.9
\$8,000 - \$11,000	7	8.2
\$11,000 - \$14,000	9	10.6
\$14,000 - \$17,000	6	7.1
\$17,000 - \$20,000	4	4.7
Over \$20,000	8	9.4
No Response	40	47.1
TOTAL:	85	100.0

TABLE 11
MODE OF TRANSPORTATION USED MOST OFTEN
 Richmond, B.C. (1988)
 N = 85

MODE OF TRANSPORTATION	NUMBER	PERCENTAGE
Regular Bus	14	16.5
HandyDART	1	1.2
Drive Yourself	50	58.8
Ride With Someone	10	11.8
Walk	9	10.6
Taxi	0	0.0
Motorized Wheelchair	1	1.2
TOTAL:	85	100.1

TABLE 12
DO YOU TRAVEL TO THE FOLLOWING DESTINATIONS?
 Richmond, B.C. (1988)
 N = 85

DESTINATION	"NO" RESPONSES	
	NUMBER	PERCENTAGE (N=85)
Grocery Store	5	5.9
Drugstore	9	10.6
Doctor's Office	2	2.4
Bank	7	8.2
Post Office	14	16.5
Restaurant	13	15.3
Barber/Beauty Salon	18	21.2
Senior Centre	10	11.8
Visit Friend(s)	6	7.1
Visit Family	17	20.0

TABLE 13
FREQUENCY OF TRAVEL
 Richmond, B.C. (1988)
 N = 85

DESTINATION	FREQUENCY (No. of Responses)				
	Daily	1-2x/wk	1-2x/mth	few times/yr	No Resp.
Grocery Store	8	67	7	0	4
Drugstore	6	23	36	11	9
Doctor's Office	0	10	26	46	3
Bank	6	32	41	2	5
Post Office	4	22	35	13	12
Restaurant	3	31	24	14	14
Barber/Beauty	2	12	31	22	18
Senior Centre	11	59	10	4	2
Visit Friend(s)	7	34	22	9	14
Visit Family	5	19	29	18	15

TABLE 14
LOCATION OF DESTINATIONS OF TRAVEL
 Richmond, B.C. (1988)
 N = 85

DESTINATION	LOCATION (No. of Responses)					No Resp.
	Immediate Neighborhood	Within Richmond	In Vancouver	Lower Mainland		
Grocery Store	32	52	1	0	3	
Drugstore	23	54	2	0	6	
Doctor's Office	2	67	13	2	4	
Bank	17	58	6	0	4	
Post Office	14	60	2	1	9	
Restaurant	3	61	11	1	16	
Barber/Beauty Sal.	12	53	6	0	15	
Senior Centre	17	62	1	1	4	
Visit Friend(s)	4	55	15	9	11	
Visit Family	5	40	17	24	16	

TABLE 15
TIME OF TRAVEL
 Richmond, B.C. (1988)
 N = 85

DESTINATION	TIME OF DAY (No. of Responses)						
	BEFORE 7AM	7AM- 9AM	9AM- NOON	Noon- 4PM	4PM- 6PM	AFTER 6PM	NO RESP.
Grocery Store	0	3	45	36	1	2	5
Drugstore	0	3	41	36	0	1	9
Doctor's Off.	1	3	39	44	0	0	7
Bank	0	2	49	33	1	0	8
Post Office	0	2	44	33	1	0	13
Restaurant	1	0	15	19	21	23	19
Barber/Beauty	1	6	36	26	2	0	18
Senior Centre	0	3	55	30	0	6	7
Visit Friend	0	0	15	27	13	34	17
Visit Family	0	0	12	28	12	33	24

TABLE 16
TRANSPORTATION MODES USED FOR VARIOUS TRIPS
 Richmond, B.C. (1988)
 N = 85

DESTIN.	FORM OF TRANSPORT (No. of Responses)							
	Regular Bus	Handy DART	Drive Yourself	Ride wth Someone	Walk	Taxi	Oth-er	No Resp.
Grocery St.	10	0	47	13	16	1	1	2
Drugstore	8	0	46	5	19	0	1	6
Doctor's	11	3	49	12	9	1	0	2
Bank	10	0	44	6	21	0	1	3
Post Office	9	0	45	6	20	0	1	6
Restaurant	4	0	47	23	2	0	1	13
Barber/Beauty	8	0	42	5	19	0	1	12
Senior Centre	8	0	44	12	19	0	1	3
Visit Friend	8	0	46	19	11	0	0	7
Visit Family	8	0	45	20	3	0	1	11

TABLE 17
DIFFICULTY ENCOUNTERED IN TRAVEL
 Richmond, B.C. (1988)
 N = 85

FREQUENCY OF ENCOUNTERING DIFFICULTY IN TRAVEL	NUMBER	PERCENTAGE
Never	38	44.7
Occasionally	37	43.5
Fairly Often	4	4.7
Very Often	3	3.5
No Response	3	3.5
TOTAL:	85	99.9

TABLE 18
POSSESSION OF DRIVER'S LICENSE
 Richmond, B.C. (1988)
 N = 85

POSSESSION OF DRIVER'S LICENSE	SELF		SPOUSE	
	No.	%	No.	%
YES	61	71.8	23	42.6
NO	24	28.2	31	57.4
TOTALS:	85	100.0	54	100.0

TABLE 19
CAR OWNERSHIP
 Richmond, B.C. (1988)
 N = 85

CAR OWNERSHIP	NUMBER	PERCENTAGE
YES	62	72.9
NO	23	27.1
TOTAL:	85	100.0

TABLE 20
EXISTENCE OF PROBLEMS DRIVING A CAR
 Richmond, B.C. (1988)
 N = 85

PROBLEM DRIVING A CAR	NUMBER	PERCENTAGE
YES	14	16.5
NO	69	81.2
No Response	2	2.4
TOTAL:	85	100.1

TABLE 21
PREFERENCE IN BUS OVER PRIVATE VEHICLE
 Richmond, B.C. (1988)
 N = 85

ARE THERE ANY TIMES WHEN YOU WOULD PREFER TO TAKE THE BUS?	NUMBER	PERCENTAGE
YES	41	48.2
NO	35	41.2
No Response	9	10.6
TOTAL:	85	100.0

TABLE 22
USE OF PUBLIC TRANSIT
 Richmond, B.C. (1988)
 N = 85

DO YOU USE THE REGULAR BUS SERVICE IN RICHMOND?	NUMBER	PERCENTAGE
YES	48	56.5
NO	37	43.5
TOTAL:	85	100.0

TABLE 23(A)
FREQUENCY OF PUBLIC TRANSIT USE
 Richmond, B.C. (1988)
 N = 85

FREQUENCY OF BUS TRAVEL	NUMBER	PERCENTAGE
Daily	4	8.3
Once or twice a week	9	18.7
Once or twice a month	13	27.1
A few times a year	22	45.8
TOTAL:	48	100.1

TABLE 23(B)
TIME OF PUBLIC TRANSIT USE
 Richmond, B.C. (1988)
 N = 85

TIME OF BUS TRAVEL	NUMBER	PERCENTAGE
Before 7 AM	0	0.0
7 AM - 9 AM	0	0.0
9 AM - NOON	25	39.7
NOON - 4 PM	24	38.1
4 PM - 6 PM	5	7.9
After 6 PM	2	3.2
No Response	7	11.1
TOTAL:	63	100.0

TABLE 24
FREQUENCY OF BUS TRAVEL OUTSIDE OF RICHMOND
 Richmond, B.C. (1988)
 N = 85

FREQUENCY OF BUS TRAVEL OUTSIDE OF RICHMOND	NUMBER	PERCENTAGE
Never	18	26.5
Occasionally	37	54.4
Fairly Often	8	11.8
Very Often	1	1.5
No Response	4	5.9
TOTAL:	68	100.1

TABLE 25(A)
USE OF HANDYDART CUSTOM TRANSIT SERVICE
 Richmond, B.C. (1988)
 N = 85

HAVE YOU EVER USED HANDYDART?	NUMBER	PERCENTAGE
YES	9	10.6
NO	75	88.2
No Response	1	1.2
TOTAL:	85	100.0

TABLE 25(B)
AWARENESS OF HANDYDART CUSTOM TRANSIT SERVICE
 Richmond, B.C. (1988)
 N = 85

ARE YOU AWARE OF HANDYDART?	NUMBER	PERCENTAGE
YES	52	61.2
NO	27	31.8
NO RESPONSE	6	7.1
TOTAL:	85	100.1

TABLE 26(A)
USE OF RICHMOND COMMUNITY LEISURE TRANSPORTATION SERVICE
 Richmond, B.C. (1988)
 N = 85

HAVE YOU EVER USED THE RICHMOND COMMUNITY LEISURE TRANSPORT SERVICE?	NUMBER	PERCENTAGE
YES	10	11.8
NO	72	84.7
No Response	3	3.5
TOTAL:	85	100.0

TABLE 26(B)
AWARENESS OF RICHMOND COMMUNITY LEISURE TRANSPORTATION
 Richmond, B.C. (1988)
 N = 85

ARE YOU AWARE OF THE RICHMOND COMMUNITY LEISURE TRANSPORT?	NUMBER	PERCENTAGE
YES	35	41.2
NO	38	44.7
No Response	12	14.1
TOTAL:	85	100.0

TABLE 27(A)
NEED FOR TRANSPORTATION SERVICE EXCLUSIVE TO SENIORS
 Richmond, B.C. (1988)
 N = 85

NEED FOR EXCLUSIVE TRANSPORTATION SERVICE?	NUMBER	PERCENTAGE
YES	41	48.2
NO	31	36.5
No Response	13	15.3
TOTAL:	85	100.0

TABLE 27(B)
WILLINGNESS TO PAY FOR EXCLUSIVE TRANSPORTATION SERVICE
Richmond, B.C. (1988)
(N = 85)

AMOUNT WILLING TO PAY FOR SUCH SERVICE?	NUMBER	PERCENTAGE
Same as regular bus fare	17	38.6
50 cents more	14	31.8
\$1.00 more	7	15.9
More than \$1.00 more	1	2.3
No Response	5	11.4
TOTAL:	44	100.0

TABLE 28
DIFFICULTY ENCOUNTERED IN TRAVEL OF EARLY AND LATE-ELDERLY
Richmond, B.C. (1988)
(N = 85)

FREQUENCY OF ENCOUNTERING DIFFICULTY IN TRAVEL	EARLY-ELDERLY		LATE-ELDERLY	
	No.	%	No.	%
Never	24	48.0	14	40.0
Occasionally	22	44.0	15	42.9
Fairly Often	2	4.0	2	5.7
Very Often	1	2.0	2	5.7
No Response	1	2.0	2	5.7
TOTALS:	50	100.0	35	100.0

TABLE 29
MODE OF TRANSPORTATION USED BY EARLY AND LATE-ELDERLY
Richmond, B.C. (1988)
(N = 85)

MODE OF TRANSPORTATION USED MOST OFTEN	EARLY-ELDERLY		LATE-ELDERLY	
	No.	%	No.	%
Regular Bus	10	20.0	4	11.4
HandyDART	0	0.0	2	5.7
Drive Yourself	31	62.0	18	51.4
Ride With Someone	6	12.0	4	11.4
Walk	2	4.0	7	20.0
Motorized Wheelchair	1	2.0	0	0.0
TOTALS:	50	100.0	35	99.9

TABLE 30
POSSESSION OF DRIVER'S LICENSE BY EARLY AND LATE-ELDERLY (SELF)
Richmond, B.C. (1988)
(N = 85)

DRIVER'S LICENSE?	EARLY-ELDERLY(self)		LATE-ELDERLY(self)	
	No.	%	No.	%
YES	39	78.0	21	60.0
NO	10	20.0	14	40.0
No Response	1	2.0	0	0.0
TOTALS:	50	100.0	35	100.0

TABLE 31
POSSESSION OF DRIVER'S LICENSE BY EARLY AND LATE-ELDERLY (SPOUSE)
 Richmond, B.C. (1988)
 (N = 85)

DRIVER'S LICENSE?	EARLY-ELDERLY(spouse)		LATE-ELDERLY(spouse)	
	No.	%	No.	%
YES	24	66.7	5	27.8
NO	11	30.6	13	72.2
No Response	1	2.8	0	0.0
TOTALS:	36	100.1	18	100.0

TABLE 32
CAR OWNERSHIP OF EARLY AND LATE-ELDERLY
 Richmond, B.C. (1988)
 (N = 85)

CAR OWNERSHIP	EARLY-ELDERLY		LATE-ELDERLY	
	No.	%	No.	%
YES	39	78.0	23	65.7
NO	11	22.0	12	34.3
TOTALS:	50	100.0	35	100.0

TABLE 33
DIFFICULTY IN DRIVING BETWEEN EARLY AND LATE-ELDERLY
Richmond, B.C. (1988)
(N = 85)

DIFFICULTY ENCOUNTERED IN DRIVING	EARLY-ELDERLY		LATE-ELDERLY	
	No.	%	No.	%
YES	7	14.0	7	20.0
NO	40	80.0	28	80.0
No Response	3	6.0	0	0.0
TOTALS:	50	100.0	35	100.0

TABLE 34
PUBLIC TRANSIT USE BY EARLY AND LATE-ELDERLY
Richmond, B.C. (1988)
(N = 85)

DO YOU USE THE REGULAR BUS SERVICE IN RICHMOND?	EARLY-ELDERLY		LATE-ELDERLY	
	No.	%	No.	%
YES	22	44.0	19	54.3
NO	28	56.0	16	45.7
TOTALS:	50	100.0	35	100.0

APPENDIX D

QUESTION #8

WHICH ONE OF THE FOLLOWING ARE MOST OFTEN THE DIFFICULTIES IN GETTING WHERE YOU WANT TO GO ? (Number of Responses)

- 32 - No difficulties
- 13 - Don't like riding the bus
- 12 - No bus line nearby
- 12 - Don't like to drive myself
- 11 - Have trouble getting in and out of bus
- 9 - Can't afford a taxi
- 6 - Have trouble walking to bus stop
- 14 - Other responses:
 - Don't have a car
 - Too long a wait between buses
 - Poor bus service
 - Can't drive myself
 - Too dependent on husband
 - Don't like driving in traffic
 - Bus does not run frequently enough
 - Poor bus connections (buses don't meet)

QUESTION #12

ARE THERE ANY PARTICULAR CIRCUMSTANCES OR TIME OF DAY WHEN YOU WOULD PREFER TO TAKE A BUS RATHER THAN USE A CAR ?

YES, PLEASE SPECIFY:

- during holidays and heavy traffic
- during the day
- in the morning and before 4 pm
- when going to Vancouver, it is easier to take a bus; one doesn't have to go back to get the car, just get on the bus and go home
- in evenings; husband won't drive unless he has to
- in rush hour; to Vancouver (downtown)
- downtown (too expensive to park)
- downtown Vancouver because of parking
- downtown to go see movies because parking is too expensive
- into Vancouver
- downtown Vancouver (traffic; cheaper; less stress and strain; parking)
- to go downtown; night driving, snowy, rainy weather
- buses stop and start too abruptly - I'll fall over if they stop
- to Vancouver; snowy, icy weather
- at night (evening); in rain
- when it's really slippery from the rain
- to downtown Vancouver (more congestion when you're caught when people are coming home - commuter traffic.
- in winter (bad weather)
- traffic is getting really bad; I don't always know my way around
- during traffic; only to Vancouver because of parking
- at night and in the afternoon

- to Vancouver - costs less money (ie. \$.65); costs much more to park in downtown Vancouver
- into U.S. border
- into Vancouver (to Stanley Park and big functions in Kits)
- icy and rainy winter conditions
- try to avoid evening rush hour
- into Vancouver
- during rush hour
- when I go downtown into Vancouver for special occasions like P.N.E. or theatre
- night travel out of the community
- snowy weather
- when taking certain medication where driving is not advisable
- daytime when less crowded and don't have to wait too long to make connections
- when going downtown into Vancouver
- to go downtown to Vancouver - too much traffic
- recent arrival to B.C. so if destination is unfamiliar, would find it easier to take bus
- in the rush hours when there is heavy traffic
- no car, mornings
- going from Richmond to Vancouver
- when going into Vancouver
- to travel into Vancouver on business
- to my doctor's office

QUESTION #14 (C)

WHAT PROBLEMS DO YOU ENCOUNTER IN USING THE BUS?

- 20 - No problems
- 12 - Having to transfer too often
- 12 - Getting into and out of the bus
- 5 - Walking to nearest bus stop
- 5 - Having to stand in the bus
- 2 - Unfriendly driver
- 16 - Other responses:
 - too long to wait for service and connections
 - infrequent service
 - not enough buses
 - long waits and poor connections
 - no cross-town bus on Williams Road and Francis Road
 - type of door design is too narrow
 - not comfortable
 - waiting for the bus in order to transfer from main street to get home
 - buses are terribly crowded even before 3 in the afternoon
 - food on bus
 - unruly and loud young people that get on and use bad language
 - transportation is bad ie. too long apart
 - have to stand and wait in cold weather; sometimes bus passes when full and you're forced to wait
 - bus driver is too impatient; the bus jerks and I fall even before I ever sit down
 - steps on bus should be lower
 - delays ie. traffic tie-ups imposed on the transit system from outside

QUESTION #14 (D)

WHAT ADVANTAGES CAN YOU SEE IN USING THE BUS AS OPPOSED TO A PRIVATE AUTOMOBILE ?

- too much car traffic on the road already
- not having to find a parking place for the car
- I like the bus because there is no parking problem
- it's more relaxing
- I don't have to depend on someone else who has a busy schedule and the taxi is too expensive
- You don't have to worry about the traffic
- No parking problem
- No worry about parking
- if service was better, I'd use the bus more often
- may have to give up driving due to health problems
- less traffic
- you can come and go whenever you want
- it would probably be cheaper to use the bus
- you don't have to depend on others
- if you don't have a car it lets you be independent
- don't have to worry about parking in Vancouver
- don't have to worry about parking the car
- you can sit back and let the driver worry about the driving
- it's handy to go downtown; good service
- cost wise, it's less expensive
- great capital outlay with car
- more economical to use bus if you live along main route
- can't always depend on a car (eg. if you're getting it repaired)

- more comfortable since you don't have to worry about driving
- more relaxing and comfortable
- going downtown, parking is difficult; buses are more relaxed; people get up for me
- driver bears the responsibility
- comfortable in heavy traffic
- don't have to worry about traffic conditions and driving
- no parking problems
- avoid having to drive in congestion (commuter traffic)
- if I didn't use it, I wouldn't be able to get anywhere
- don't have to worry about traffic; save on gas because I have a transit pass
- no parking problem; too expensive to take car downtown and shop
- don't like driving in places I don't know very well; to Vancouver
- costs less money using the bus (\$.65 compared to \$5.00)
- you can see around in people's gardens; you can talk to people and see the children. I like the friendly things.
- no parking problem
- parking downtown and driving into Vancouver
- it's a "lazy means of transportation"; you don't have to be as "on the ball" ie. can go to sleep, it's easy transportation.
- parking is hard to get and buses are much more practical - one less car on the road

QUESTION #17

WHAT IMPROVEMENTS TO THE BUS SYSTEM WOULD PERSUADE YOU TO USE THE BUS MORE OFTEN ?

16 - No response

19 - None (eg. "I love my car")

- for the driver to wait to start until one is seated
- more frequent service and speedier connections
- let seniors go free
- a more frequent service
- considerate and polite drivers
- considerate drivers
- better bus schedule
- more direct service to Richmond Town Centre to get to express bus. I must transfer from where I live; rapid transit to Burnaby.
- if you want better service, the user must pay (Catch 22 situation); if you want to keep costs down, you must keep quality down.
- car is too convenient
- I'd like the bus to come closer to where I live; windows need cleaning (when sun shines, they're dirty)
- more frequency, especially on a Sunday. You have to wait too long in Richmond if you miss a bus.
- with a car I can come and go as I like; it's too convenient.
- bus driver should slow down and give me time to get off
- more cross buses (east to west and vice versa)
- maintain non-rush hour routing during rush hour time and put others on other buses.
- the number on the bus should be put further down on windows (right where door opens) of buses so people can see it (ie. the visually impaired).
- if you miss a railway bus, you'll have to wait
- better connections

- more service, especially Saturday, Sunday, and holidays
- to have buses going direct to the city without having to transfer to another bus
- running on time, which is often the reason why you don't make a good connection
- more frequent service (it's hourly where I live)
- more connecting routes at transfer points
- an east - west service (ie. west dyke to # 5 or # 6 Road)
- better cross connections on Westminster Highway and Williams Road or places where seniors meet.
- some east - west service as all lines lead to Brighthouse and/or to Vancouver.
- there's always room for improvement
- have them run more often; as of now, if you miss the bus, you have to wait another 30 minutes (not too bad if you have a good book with you, and if it doesn't rain or you don't have to endure the scorching sun)
- better and more frequent service in suburban areas
- better service, also when going through several zones makes it expensive
- closer bus stop
- More frequently

QUESTION #18 (B) & (C)

(B) HOW OFTEN DO YOU USE THE HANDYDART SERVICE?

(C) FOR WHAT PURPOSE DO YOU USE THE HANDYDART SERVICE ?

(B)

- 1 - once or twice a month
- 2 - once or twice a week
- 1 - a few times a year
- 1 - about ten different times
- 1 - only one circumstance
- 2 - no response

(C)

- to get cancer treatment - Vancouver Cancer Clinic
- to doctors' appointments
- after a knee replacement operation to go to therapy
- I would use it for doctors' visits
- if there were more vehicles available, one could make more use of it
- we need more HandyDART service
- for doctors' appointments and to visit friends in hospital
- going to hospital for treatment or to doctor's office

QUESTION #21

FINALLY, I'D LIKE YOU TO ENVISION A PUBLIC TRANSPORTATION SYSTEM WHICH WOULD BEST SATISFY THE TRAVEL NEEDS OF OLDER PEOPLE LIKE YOURSELF. HOW IMPORTANT DO YOU CONSIDER THE FOLLOWING CHARACTERISTICS WITHIN SUCH A SYSTEM ?

ESSEN- VERY SOMEWHAT NOT NO
TIAL IMPORT. IMPORT. IMPORT. RES.

(A) FEATURES OF REGULAR BUS

	ESSEN- TIAL	VERY IMPORT.	SOMEWHAT IMPORT.	NOT IMPORT.	NO RES.
a) SIGNS ON THE BUS IDENTIFYING WHERE IT IS GOING	45.9%	34.1%	7.1%	1.2%	11.8%
b) DISTANCE TO THE BUS STOP	20.0%	43.5%	20.0%	4.7%	11.8%
c) SHELTER AT THE BUS STOP	31.8%	40.0%	15.3%	2.4%	10.6%
d) NUMBER OF TRANSFERS REQUIRED TO REACH DESIRED DESTINATION	10.6%	25.9%	35.3%	7.1%	21.2%
e) RESERVED SEATS FOR SENIORS	22.4%	20.0%	14.1%	28.2%	15.3%
f) FREQUENCY OF SERVICE	14.1%	47.1%	20.0%	2.4%	16.5%
g) HAVING THE DRIVER ANNOUNCE EACH DESTINATION	15.3%	38.8%	23.5%	10.6%	11.8%
h) ADHERENCE TO PRINTED SCHEDULE	34.1%	40.0%	7.1%	0.0%	18.8%

ESSEN- VERY SOMEWHAT NOT NO
TIAL IMPORT. IMPORT. IMPORT. RES.

(B) FEATURES OF A PERSONALIZED TRANSPORTATION SYSTEM

	ESSEN- TIAL	VERY IMPORT.	SOMEWHAT IMPORT.	NOT IMPORT.	NO RES.
a) STORAGE SPACE FOR PACKAGES	14.1%	21.2%	23.5%	20.0%	21.1%
b) MAKING RESERVATION IN ADVANCE IN ORDER TO BOOK A SEAT	10.6%	20.0%	20.0%	27.1%	22.4%
c) USE OF SERVICE EXCLUSIVELY BY THE ELDERLY	7.1%	14.1%	24.7%	30.6%	23.5%
d) WEEKEND SERVICE	10.6%	24.7%	31.8%	8.2%	24.7%
e) ASSISTANCE FROM DRIVER IN GETTING IN AND OUT OF VEHICLE	12.9%	18.8%	28.2%	17.6%	22.4%
f) HAVING A MECHANICAL DEVICE (EG. RAMP LIFT) IN ORDER TO ELIMINATE THE USE OF STEPS	5.9%	18.8%	25.9%	21.2%	28.2%
g) HAVING A WHEELCHAIR TIE-DOWN ON THE VEHICLE	7.1%	18.8%	24.7%	23.5%	25.9%
h) PICK-UP AND DROP-OFF AT PLACE OF RESIDENCE	7.1%	24.7%	24.7%	21.2%	22.4%

	ESSEN- TIAL	VERY IMPORT.	SOMEWHAT IMPORT.	NOT IMPORT.	NO RES.
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(C) FEATURES IN A VEHICLE

a) HEATING AND AIR CONDITIONING WITHIN THE VEHICLE	23.5%	30.6%	14.1%	7.1%	24.7%
b) FRIENDLY AND COURTEOUS DRIVER	55.3%	29.4%	2.4%	0.0%	12.9%
c) NUMBER OF STEPS REQUIRED TO BOARD AND EXIT THE VEHICLE	15.3%	38.8%	10.6%	14.1%	21.2%
d) COST OF THE RIDE	14.1%	31.8%	29.4%	3.5%	21.2%
e) COURTESY OF OTHER PASSENGERS	21.2%	43.5%	11.8%	3.5%	20.0%
f) EVENING SERVICE (AFTER 6 PM)	5.9%	27.1%	32.9%	16.5%	17.6%
g) LIMITING THE NUMBER OF PEOPLE ON THE VEHICLE TO THE EXACT NUMBER OF SEATS	11.8%	28.2%	25.9%	14.1%	20.0%
h) VISIBLE SAFETY FEATURES (EG. HANDRAILS, AMPLE LEG ROOM)	31.8%	35.3%	10.6%	2.4%	20.0%
i) SIZE OF THE VEHICLE (EG. VAN- SIZE, BUS-SIZE, CAR-SIZE)	7.1%	23.5%	36.5%	7.1%	25.9%

QUESTION #29

DO YOU HAVE ANY OTHER COMMENTS TO MAKE REGARDING THE TRANSPORTATION ALTERNATIVES AVAILABLE TO YOU WITHIN RICHMOND ?

- Better transfer service at some areas
- HandyDART could be more available for sickness, doctors' appointments, etc.
- Usually I am satisfied. I've been riding buses for 30 years. There's room for improvement however. I am now retired and don't really need the bus that often.
- The Leisure or Municipal bus is or should be available to all seniors as a right, not only to groups registered with Minoru or Leisure Services; we are all taxpayers and to pay a volunteer driver \$7.50 for a dinner is preposterous.
- In Richmond, cross service to connect with buses north to south. Everyone doesn't want to go to Brighthouse or Vancouver.
- Besides public transportation (bus service) very little other is available - would like to see better service some way.
- The #1 bus is supposed to meet the #2 bus (#1 coming from Vancouver). The No.1 stops at London Drugs half way down block, then have to run up to #3 Road, cross two lights, then half a block down #3. Many times the No. 2 has gone.
- much better connections between Vancouver and Richmond.
- connections on Knight street to New WestMinister Road
- Not enough left turn signals in main intersection
- bus driver should pay more attention to people who are waiting
- I saw people turned off bus by bus driver because they didn't have proper change - during EXPO.
- more direct bus service to Richmond Town Centre - to catch the express bus to downtown Vancouver, I must transfer at least one bus from where I live.
- not a bus that goes across Steveston Highway; Nothing from #3 Road and west
- bus drivers are very polite - they'll help you get on and off.
- there should be a bus from #1 to #5 on Blundell (east & west).
- the driver should call out main stops along the way unless the person asks the driver to let them know personally.
- more frequency so people wouldn't have to stand (more buses)

- to Vancouver (no problem) you can use express bus - coming home the wait to transfer to bus off of main route is too long especially in bad weather.
- trouble with frequency (TRANSFERRING IS THE BIGGEST PROBLEM)
- pick-up and take-home service for groceries (too many packages).
- buses should run more often
- bus schedule should be posted on shelter or post so no one knows exactly when buses are coming so you don't have to wait in the rain or snow.
- ramps for motorized wheelchairs should be constructed at all intersections.
- Richmond has a super transportation system from what I can see - I have no problems, especially since I use my car all the time.
- benches at every bus stop
- buses should pull right up to the curb
- getting on and off the bus is difficult
- not too much running east and west
- too much congestion on Cook Street
- taxi is too expensive
- more shelters; bus stop areas should be beautified (made more pleasant)
- cost for several zones is reasonable (\$.65)
- In U.K., mini-buses go on a fixed-route; they stop anywhere and drop you off anywhere - distinctive colors; privately-owned and very effective. It took a lot of weight off of the normal transport particularly during rush hour for elderly.
- a mono-rail system like downtown Vancouver to New West is needed
- whole of Vancouver area badly needs fast-transit train to take excess traffic off the streets. Vancouver is getting big.

APPENDIX E

Richmond Bus Service

