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Long-Range Transportation Planning for the Elderly in Ontario

ROBERT A. WOLFE AND ERIC J. MILLER

In Canada few long-range planning studies have addressed the transportation needs of the rapidly growing proportion of elderly people in the general population. In this paper the characteristics of the elderly population are identified, and forecasts about this population to the year 2021 are discussed. Given these data, the elderly population is segmented into seven life-style groups, such that the group definitions are invariant through time, but the number of people in each group is allowed to change. Next technological, organizational, and service-related innovations that may be applied to five modes of transportation are enumerated. These innovations are briefly discussed, and how they might affect the seven life-style market segments is outlined. Finally, three scenarios for the future are developed to indicate which innovations are most likely to affect large groups of the elderly. Findings indicate that innovation in small-scale, locally oriented types of special transit appears to be able to increase the mobility of the largest number of elderly persons.

In Canada few long-range planning studies address the issues of transportation for elderly persons; it has been only recently that Canadian governments realized that the elderly will comprise a rapidly growing proportion of society. Various government ministries in Ontario have begun to address seriously the long-term issues of future housing, health care, and social requirements of the elderly population into the 21st century. The analysis reported in this paper was commissioned by the Ontario Ministry of Municipal Affairs and Housing because it was interested in how transportation plans could be blended with its own long-term housing plans.

The procedure adopted in this study was totally conceptual, and not statistical. Instead transportation demand was treated in terms of the needs and requirements of tomorrow's elderly population. The supply system was discussed in terms of innovations and changes to current supply that could affect future needs and requirements. Finally, a rough attempt was made at scenario development, so that supply changes could be somewhat related to the future quantity of demand.

The study was conducted in the absence of any

reliable or thorough data; only the most simple demographic tabulations were available. Consequently, the results of the analysis, and certainly the methodology, could be applied to areas other than Ontario.

Given this context for the study, the population groups being discussed are first identified and then their needs and behavior are outlined as briefly as possible. Supply innovations are then discussed as they affect the needs of the elderly. Finally, the scenario results are briefly reported in a policy-making context.

THE ELDERLY IN ONTARIO

In this section the characteristics of the elderly are described only to the extent required to establish their travel behavior and needs. More complete treatments of the socioeconomic dimensions of the elderly population of Ontario may be found elsewhere (1,2).

The term elderly has a varied meaning but is generally taken to mean those people aged 65 years or older, although United Nations documents include people aged between 55 and 64 in this definition. Clearly, such a definition is problematic because many people aged 65 or older act much younger, and many younger people have patterns of behavior similar to much older people. Although this important point is recognized, in order to coincide with the census definition in Canada, as well as typical retirement ages, the elderly are defined in this paper as those people aged 65 and older.

Data based on the 1976 Canadian Census place 865.3 thousand people in this group in Ontario in 1981. A breakdown of the elderly population by age and sex, and a comparison of this breakdown to the population in Ontario as a whole, is given in Table 1 (1). The data in this table indicate that the elderly account for approximately 10 percent of

Table 1. Characteristics of the elderly in Ontario, 1981 (1).

Age (yr)	Male (000s)	Percentage of Male Elderly	Percentage of Ontario Total	Female (000s)	Percentage of Female Elderly	Percentage of Ontario Total	All Seniors (000s)	Percentage of Elderly	Percentage of Ontario Total
65-74	239.7	66.1	2.7	289.9	57.6	3.3	529.6	61.2	6.0
75-84	100.6	27.8	1.2	161.3	32.1	1.8	261.9	30.3	3.0
<85	22.1	6.1	0.003	51.7	10.3	0.006	73.8	8.5	0.009
Total	362.4			502.9			865.3		
Ontario	4,320.5			4,410.4			8,730.9		

Ontario's 1981 population, and that the majority of them are in the so-called young-old group of ages, i.e., between 65 and 74. In addition, it is evident that there are more older women than men in the population (male-to-female ratio of 0.72), and that this difference is considerably greater than that for the population as a whole (which has a male-to-female ratio of 0.97). Finally, there are more women in the older categories, particularly aged 85 and older, where there are more than twice as many women as men.

Further data regarding the elderly are far more difficult to obtain. Based on the data that are available, the current elderly population in Ontario can be characterized as follows:

1. The proportion of the elderly that are married drops dramatically as age increases;
2. More than half of the elderly population live with relatives, and less than 10 percent live in some form of collective housing;
3. Mean incomes of young-old females are half those of males, but similar to each other for old-old persons; incomes are approximately half the mean figure for all ages in Ontario; and
4. Less than half the elderly have a driver's license, and probably even fewer own an automobile.

Several forecasts are available concerning the future population of the elderly, although these forecasts usually are categorized by age and sex only, thus providing little or no information regarding employment, automobile ownership, and living arrangements. For example, Figure 1 shows a forecast for three age groups in which it is projected that the elderly will constitute 26 percent of the population in Ontario by the year 2021. It is clear from the data in this figure that the number of young-old (aged 65 to 74) will increase at an extremely high rate, one that will be greater than that for the general population. This trend indicates that there will be an extremely large group of reasonably active older persons by the year 2000.

Other Statistics Canada data relate to male-to-female ratios and point to the rising proportion of females in the elderly population. Little data are available that project single-person households, but one report (2) provides indices of growth of non-married people older than age 65. In Ontario, by using 1971 as a base index of 100, the index will grow to 109 by 2001 and to 348 by 2021. No data are available to compare this to other age groups or to the general population. Similar data are available concerning nonfamily households (living alone, sharing, institutionalized) with the head of the family older than age 65. No data are available in comparison to other age groups, but it is apparent that there will be many households headed by elderly people who are single or who are living in institutional or shared quarters.

TRANSPORTATION NEEDS OF THE ELDERLY

A basic premise of this paper is that the needs of the elderly are no different from any other adult group in society. A fundamental right of all people in society is equal access to facilities (and this too is fundamental to the needs of the elderly).

Previous studies of the transportation needs of the elderly have adopted a life-style market-segmentation approach. For example, Wachs (3) divides the elderly population into seven groups based on empirical data and statistical analysis. No such analysis was possible in this study, as the data required were not available. Instead, a set of life-style groups was defined judgmentally, subject to the requirement that they be specifically transportation

Figure 1. Forecasts of the elderly population in Ontario.

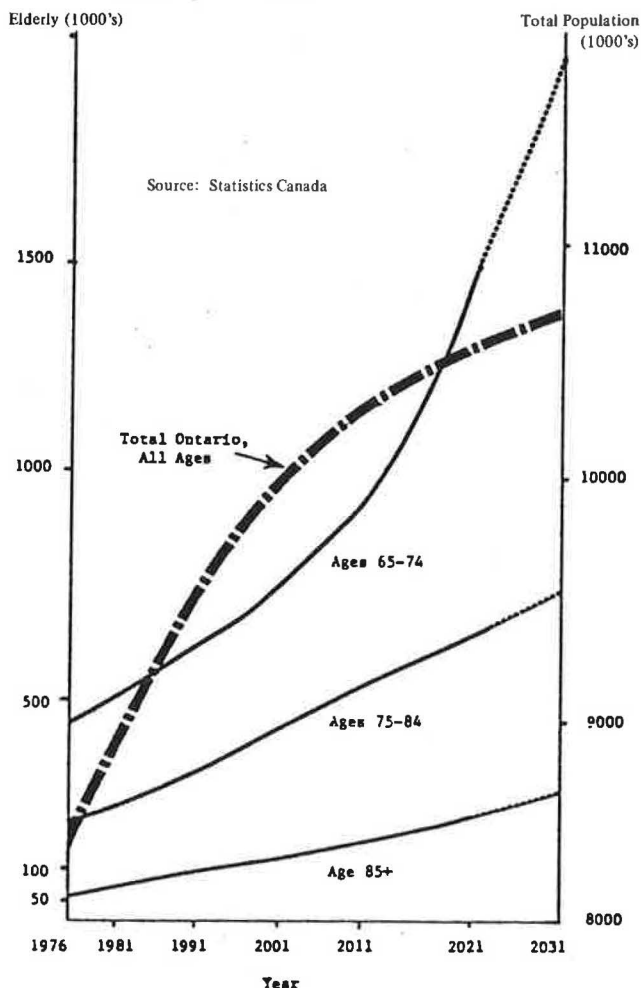
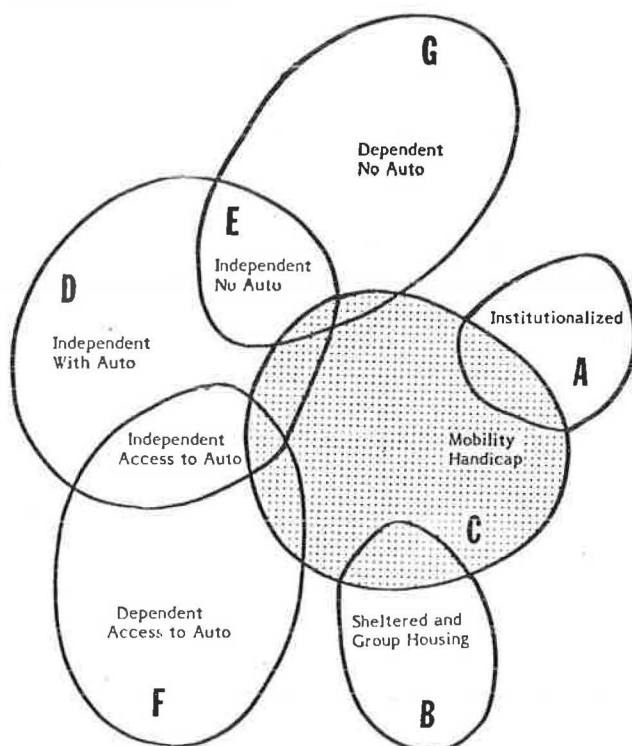


Figure 2. Life-style groups.



related and that they be invariant with time (the number of people within each group, though, will not necessarily be constant with time).

Figure 2 shows a typology of seven life-style groups:

1. Institutionalized, with severe mobility constraints;
2. Sheltered and group housing, with some degree of financial or physical dependence;
3. Handicapped, under any income level and living arrangement other than 1 or 2;
4. Independent, owns automobile, and has the financial means to drive it;
5. Independent, no automobile, but may have access to an automobile;
6. Dependent, access to automobile; and
7. Dependent, no automobile, or access to one.

The terminology used in these group definitions is as follows. The term institution is used to define any nursing home, hospital, or similar facility for residents who are not able to care for their own needs. Handicap is used to refer to physical mobility constraints caused by health problems or physical disability. Independent people are defined as those who are financially independent and do not require the aid of others in their living quarters. Therefore, independent people could be living alone or with a spouse, sibling, or friends by their own free choice. Those whose accommodation is determined by income constraints or require the financial aid of others are termed dependent.

The interdependence of these definitions is shown by the overlapping boundaries in Figure 2. Probably the greatest overlap occurs within the handicapped category, but in terms of transportation, independence, and automobile ownership this overlap is not that relevant, as the handicapped have special needs regardless of their living situation. Other potentially relevant characteristics, such as whether or

not the person works and whether he lives in a rural, urban, or suburban setting, can be used to define subgroups within the seven major groups, although such subgroups will not be examined here.

Most analysts expect there to be major life-style differences in the future for the elderly. For example, Wachs (3) indicates that the elderly in the future will be a more heterogeneous group than today. This does not mean that there will be more life-style groups, but rather that the proportions of the population will be more evenly distributed.

Other expectations concerning the future elderly population include the following.

1. The elderly will be more affluent because of a larger proportion of people in the work force than today. More people working today means that more people will collect pensions and the like in the future. (The future value of pension income is another issue, but this will not be considered here.)

2. The elderly will be healthier as a group. This assumption is based on historically observed increasing survival rates. Such a conclusion must be viewed with caution, however, as most medical people believe that there is an upper limit on the life span, although people may be healthier as they approach this limit.

3. The elderly will be more independent in their living arrangements. With trends toward fewer nuclear families today, the elderly of the future will depend less on their children and attempt to be more independent in their activities. Today's independent women can be expected to continue their independence as they grow older. High divorce rates today may lead to fewer married elderly. Finally, because many of today's couples do not have children, they will by definition have no one to depend on in their old age.

4. The elderly will be more educated and have broader interests. This will have significant implications for their work force participation desires.

5. The elderly will have higher automobile ownership levels. The hypothesis here is that people dependent on the automobile today will act the same later in life.

These points do not indicate that the life-style groups change, but rather that as the elderly population evolves, the groups will still be relevant. Given this assumption, the transportation needs of each group may be briefly summarized. This discussion is not meant to be exhaustive, and details may be found in a report by Wolfe and Miller (4).

Institutionalized

The institutionalized proportion of the elderly population is small and is not expected to change significantly with time. An argument may be made that institutionalized people have no significant transportation needs, but this is not so. Therapeutically, the benefit gained from an outside trip may be immense, and, if medically able, the person should be encouraged to make trips to shopping centers, relatives, friends, and so on. Issues associated with being able to make such trips include the following.

1. For nonwalking trips, vehicles are needed that accept wheelchairs and people with severe mobility problems.

2. Most locations in modern cities (particularly residential locations) are not accessible by the physically disabled. Thus, even if a trip could be

made, the person might not be able to gain physical access to the building or activity that is the object of the trip.

3. Perhaps most important, the ability to make short trips by walking or with aid in a wheelchair is required. The need here is for a pleasant, exciting, and barrier-free environment with destinations that may be of interest to elderly persons.

Sheltered and Group Housing

Common needs of the elderly living in sheltered and group housing include the following.

1. An interesting and safe walking environment of about 100- to 200-m radius would be of value to handicapped and mobile elderly persons. They should be able to reach shopping, recreational, medical, and service (e.g., post office) destinations without crossing major barriers. Barriers include high-speed roads, multiple-lane roads, railway tracks, extreme natural features (hills), or dangerous land uses. In general, throughout the walking environment, street orientation of facilities and street furniture appears to be important to this population group.

2. Public transportation services that may be used to travel to dispersed locations must be readily available with a route structure that accounts for the dispersed nature of travel. Paratransit is included here. Reduced or subsidized fares are essential to encourage tripmaking among economically disadvantaged persons.

3. Special services for physically disabled persons are needed for equal access.

Physically Disabled (not in sheltered or group housing)

The physically disabled elderly who live on their own or with family have special transportation needs. They are few in number and are fairly independent if they are able to live under such conditions. Hence it is expected that they are able to use transportation facilities available to the general physically disabled population.

One problem is that some elderly people gradually become handicapped through arthritic or other ailments and have great difficulty adapting to their new situation. These people, if living independently, may have problems because of not knowing how to access special transportation services.

Physically disabled people who live with families or spouses need the same type of services that other handicapped people require. The problem here is often psychological, in that the spouse or family is not able to assist them adequately, and such assistance ultimately may become a severe burden. Thus members of this population may become captives by depending on others rather than on public transportation special services.

Independent, Owns Automobile

Independent elderly persons who own automobiles are fully capable of making nearly all of their trips by this mode, subject to several provisions.

1. The elderly must be able to afford to use the automobile. Currently, this is a constantly increasing cost, so some trips may not be made or may have to be made by other modes. In addition, the economic prospect of purchasing a new car today is difficult for most elderly persons. Thus, as the person and car age, members of this group may decide to use other modes.

2. The elderly may not all have the psychological or physiological stamina to endure heavy traffic or long stretches of highway travel, and hence some trips may be made on other modes.

3. Some automobile trips may not be possible because of medical problems such as night blindness.

Independent, No Automobile

The subgroup independent, no automobile must rely on nonautomobile modes to make trips of any nature. The problem of serving this group is exacerbated by their dispersion in space. That is, not all such people will be located near a public transit route. Those who do have normal bus access have the means to travel, providing the routes that are nearby actually serve their needs. For example, radial routes to a downtown area may not take the independent elderly to convenient shopping or medical locations. In addition, walking to bus stops in winter may be difficult even for healthy elderly persons, and waiting for buses in any weather can be onerous. Therefore, normal public transit modes are able to serve the needs of only some subset of this population and may not even be able to supply all of this subset's trip demands. Clearly, a fundamental need of this group is for some form of transportation that may serve their particular needs, which include access to dispersed trip origins and destinations, short walk trips to wait for the mode, short wait times, and reasonable cost.

Dependent, Automobile Access

The life-style group of dependent, automobile access leads an unusual existence when related to their transportation needs. They live with others and use their automobile or take rides with others when possible. Otherwise they depend on other transportation modes that may or may not supply their needs properly.

For those trips that are made by automobile, these people must rely on the schedules of others. If they wish to use the automobile themselves, it must be available, which may not be often. Typically, automobiles that are used for work are not available to those elderly persons for most of the day. Hence this population must either act like dependents with no automobile access or become captive to the limited automobile access that they have available.

If they desire to obtain rides with others, the other persons must be available along with the car--and be willing to drive the elderly person to a destination. This results in severe forms of dependency on the services of others.

Dependent, No Automobile

The group of dependent, no automobile forms a small proportion of the elderly population, but many of the group just discussed (dependent, automobile access) are often without automobile access. Those with no automobile access and dependent on others generally have financial constraints and hence become the most disadvantaged of all of the elderly. With no automobile access, they must depend on walking and transit for all tripmaking.

It is clear that walk trips may not supply all needs if this population is dispersed because not all origin locations are well located, close to destinations, or in a barrier-free environment. Similarly, transit is not ubiquitously available and can be costly for elderly persons with limited incomes. Taxis and similar expensive modes cannot be used for most trips. Hence portions of this group

Table 2. Trip purposes by the elderly.

Purpose	Percentage of All Trips		
	1979, Metro-politan Toronto	1978-1979, Durham Region	1977, Ottawa-Carleton
Home-based work	13.8	6.5	11.8
Home-based shopping	31.6	34.0	49.0
Home-based social, recreational, other	37.5	43.5	26.7
Non-home-based trips	11.6	10.5	12.2
School	5.6	5.5	0.4

Table 3. Modal choice by the elderly.

Mode	Percentage of All Trips		
	1979, Metro-politan Toronto	1978-1979, Durham Region	1977, Ottawa-Carleton
Driver	47.8	65.1	50.9
Passenger	15.9	25.3	18.7
Taxi	2.5	1.2	1.9
Transit	32.2	7.9	26.1
Walk (to work)	1.4	0	1.7
Other	0.3	0.5	0.8

become captive to the trips that they can make, not those that need to be made.

THE SUPPLY SYSTEM

Current Supply

Most Ontario cities with a population greater than 30,000 have some form of public transit service, even if it is of a limited nature. Of course, the major cities have extensive route networks and special services for the elderly and the handicapped, but the services are generally not specifically oriented for use by the elderly. Fixed-route public transit systems are typically radial in nature, bringing people from dispersed locations into city core locations. Special demand-responsive and other services almost all give priority treatment to people making work trips--something that is not always of benefit to elderly persons today.

Use of these and other modes by the elderly population is not well documented. Limited surveys in the Toronto and Ottawa areas were collected in the late 1970s; the basic results are given in Tables 2 and 3. These data indicate that most trips are home-based shopping or social-recreational in nature. In large cities about half the trips are made as automobile drivers, with public transit an important second. The less-urbanized Durham region, which possesses far less transit services than either Toronto or Ottawa, is, not unexpectedly, more automobile oriented.

Results from other surveys indicate that

1. Important barriers perceived by the elderly are uneven slopes, street crossings, bad weather, climbing steps, no seats on buses, and not enough time to sit down on buses (similar results are found for the general handicapped public);

2. There is a general fear of subways because of stairs, walking in long corridors, and loss of general orientation to the street;

3. Walk trips are severely hampered if packages must be carried;

4. Elderly people fear crime at night and in poorly traveled areas;

5. Inflexible transit routes are blamed for low use among elderly people; and

6. Taxi use is limited because of cost.

In summary, it appears that the elderly are severely disadvantaged in terms of transportation because the systems currently available are not suited to their needs.

Future Transportation Innovations

The purpose of this section is to explore possible transportation innovations that might occur over the next 50 years and that might affect transportation services for the elderly. In considering this highly speculative topic, the following basic assumptions were made about the future:

1. Petroleum will still be available 50 years from now in sufficient supply and will still constitute a major fuel source for economic activity (including, possibly, transportation), although the price of petroleum will be considerably higher than it is currently in real dollar terms;

2. The economic and social order will be approximately the same as it is at present;

3. No radically new transport modes will emerge during the next 50 years;

4. The relative roles of the public and private sectors in the supply of transportation services could change; and

5. As the elderly population increases in size it will be vocal in its concerns and may be able to wield considerable power.

To assess the range and types of transportation innovations that are possible, a typology of the subject was developed. Five modes of transportation and three types of innovation were considered. The modes are

1. Private automobile, including any future technological derivations that might emerge;

2. Fixed-route public (conventional) transit, regardless of type of vehicle and right-of-way used;

3. Special transit, which consists of all public and private transit and paratransit services other than fixed-route public transit;

4. Walking; and

5. Cycling.

The types of innovation are technological, organizational, and service related. Pricing innovations were not considered, as this is inherently a political issue that involves the role of transportation as a public good and the redistribution of wealth in society.

The possibilities to be considered exclude certain cases a priori. For example, it was believed that no organizational changes are possible that could affect the walking mode. Given this typology, each possibility was examined in detail. The findings are too lengthy to report here, but they are summarized in Table 4. Although the data in the table only outline a few innovations, details of more possibilities are given by Wolfe and Miller (4). Reported here are those innovations that appear to be most promising and feasible in their potential impacts on the elderly population. In order to elaborate on the table, each mode will be dealt with separately.

Table 4. Summary of promising innovations by type and mode.

Mode	Innovation		
	Technological	Organizational	Service Related
Automobile	Incremental improvements or new power plants Urban car	Elderly community rental fleets	NA
Fixed-route public transit	Vehicle improvements Customer information systems Improved security systems	NA	Well-lit, enclosed stop shelters Information displays at stops Coordination and integration with land uses and buildings
Special transit	Improved control systems Improved vehicles	Transportation brokerage systems Elderly transportation organizations	Range of paratransit service options
Walking	Limited applications of moving sidewalks, enclosed sidewalks, and so on	NA	Micro-design options for sidewalks and walkways Separation and protection of pedestrians from automobiles
Bicycle	Adult-sized mopeds Enclosed bikeways	NA	Open-air bikeways

Note: NA = not applicable.

Automobile

It is expected that changes to the automobile will occur during the next 50 years, regardless of the needs of the elderly population. Smaller cars are expected, possibly two-seater urban cars. Because a greater proportion of today's adults are drivers, tomorrow's elderly persons, particularly women, will be used to being able to use and drive automobiles. Only the price of the vehicle and fuel will be the strong controlling factor.

One interesting organizational innovation may be community car fleets, where the capital cost of a fleet of cars may be shared across many users, and individuals will pay for their use on some measured basis. This is a particularly good option for older persons living in group housing.

Fixed-Route Public Transit

Through technology, fixed-route transit vehicles may be slightly modified to be more accessible by the elderly. In addition, different vehicle sizes may be more appropriate for certain demand levels. Of major importance is the possibility of digital communication systems so that the elderly (and others) may be able to minimize their waiting time. Psychologically, this could increase transit access for the elderly.

In terms of service-related innovations, shelters, lighting, and proper snow removal are necessary. Information displays and access to information are important. A critical point is the integration of transit facilities with land use design. A great deal could be said here, but it may be sufficient to provide a statement that coordination of service and building design is important.

Special Transit

Through technology, control systems and vehicles could be changed and modified to aid the transportation needs of the elderly; for example, mini-buses could have lower floors and fewer steps.

Organizationally, brokerage systems and systems run by the elderly have the greatest possibilities of providing cost-effective service. The types of service are many, but they might revolve about a jitney-style service that runs in small loops to and from traffic generators and attractors.

Walking

Technologically, few improvements are possible, but enclosed and weather-protected walkways are possible. Proper snow removal is also critical. In terms of service, separation of traffic and pedestrians may be an appropriate goal.

Cycling

Vehicles suited to elderly persons may be designed that are both powered and nonpowered. Open-air and enclosed bikeways are also possible.

Summary

Although these innovations are only briefly described, how they might affect the various subgroups of elderly persons can be summarized. Figure 3 shows that special transit options have the strongest impact on the most groups, with automobile innovations a close second. In the next section how these impacts relate to the number of people in each group is described.

FUTURE SCENARIOS

The life-style groups that have been developed in this paper are designed to be invariant in time with respect to their definitions, although the proportion of the elderly in each category does indeed change. Therefore, the future transportation needs of any single life-style group remain exactly as earlier described, except that their relative importance changes as the general demographics of population evolve through time.

Referring to Figure 1, the 1981 ratio of elderly persons to total population is about 0.10. In the year 2021 it is forecasted to be 0.26. This means that an increasingly large proportion of society will have specialized needs, as previously described. To assess the magnitude of these needs, a set of scenarios was developed judgmentally to analyze how society might evolve, and then how transportation innovations would be required to service the future elderly population. A summary of these scenarios, and the percentage of each life-style group relative to the entire Ontario population, is given in Table 5.

The base scenario describes what would happen if

Figure 3. Distribution of innovation impacts.

GROUP	Automobile		Fixed-Route Public Transit		Special Transit			Walk		Bicycle	
	T	O	T	SR	T	O	SR	T	SR	T	SR
A. Institutional											
B. Group & Sheltered Housing											
C. Physically Disabled											
D. Independent with auto											
E. Independent without auto											
F. Dependent with access to auto											
G. Dependent without access to auto											

Legend





	High Impacts	T - Transportation Innovation
	Medium Impacts	O - Organizational Innovation
	Low Impacts	SR - Service-Related Innovation
	No Impacts	

Table 5. Relative proportion of each life-style group for different scenarios.

Elderly Groups	1981	Percentage of Total Ontario Population in the Future		
		Base	Pessimistic Economy	Public Intervention
Institutionalized	1	3.9	3.9	5.2
Sheltered and group housing	1	5.2	10.4	11.7
Handicapped	0.5	1.3	1.3	1.3
Independent, with automobile	2	9.1	2.6	2.6
Independent, no automobile	1	1.3	2.6	1.3
Dependent, automobile access	4	3.9	2.6	2.6
Dependent, no automobile	0.5	1.3	2.6	1.3

all current trends were to continue unchecked and if no major economic changes were to occur in society. Given these assumptions, the data in Table 5 indicate that the elderly will make up a much larger proportion of society, that many of the elderly will be independent in terms of living arrangements, and that a large number of independent older persons will be automobile owners.

Under this scenario the transportation needs of the elderly will not actually change, as those who need nonautomobile transportation will constitute a proportion of society similar to current levels. The only difference that might occur is a gradual increase in the number of people in group housing. This implies the need for local transportation in the environment near the homes, and the need for

easy access to distant destinations for work and other trip purposes.

In the pessimistic economic scenario, petroleum will become a scarce resource and automobile use (in any form) will be largely curtailed. Referring to the data in Table 5, nearly 11 percent of the total Ontario population will be elderly and living in group or sheltered housing under this scenario (this housing might be provided by the nonprofit and private sectors). It should be noted that this represents more than the entire proportion of all the elderly in 1981.

The significance of this change is that there will be large groups of healthy elderly persons living in areas that will require satisfactory transportation access and service. This change implies that land use planning will become as important as transport planning because the location of facilities and services will be critical. Another issue here is the spatial distribution of the population, specifically the problems of the population in the suburbs without automobiles. The proportion of the population in this situation could be as much as 25 percent of all elderly and 6 percent or more of the total population.

The changes in society that take place under the public-intervention scenario are expected to cause an arrangement of population similar to the pessimistic scenario, except that 65 percent of the elderly population will be in institutions or in sheltered or group housing. The implications of this are obvious in that needs will have to be supplied through a different form of service than exists today. Land use planning will become of overwhelming importance to ensure efficiency of movement. The other difference here is that a larger proportion of society will be employed,

thereby creating the need for special services for these people.

Referring to Figure 3, it becomes apparent that special transit innovations should be able to affect the greatest number of people in each scenario. For example, high impacts from special transit could affect 13, 19.5, and 18.2 percent of the entire population in Ontario in each of the scenarios, respectively. The probable number of people in sheltered and group housing could make community automobile fleets possible, and walking and cycling innovations will have widespread effects.

In a policymaking context these conclusions have the implication that considerable investment in modes other than fixed-route transit is required if no brokerage or other concepts develop. This is not in the Ontario government's current concept of the future, and authorities are only beginning to consider the implications of this conclusion.

SUMMARY AND FURTHER WORK

The major conclusion that can be drawn from this work is that the life-style group scenario approach appears to be a promising manner of looking to the future. If further work is to be done, quantification of the groups and projections could add firmer

evidence to the conclusions. This work will be done in the future when detailed results from the 1981 national census of Canada are released.

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Transportation of the Elderly and the Handicapped in Rural Areas: The Manitoba Experience

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A transportation service for the elderly and the handicapped in small towns and rural municipalities is described. This service is supported by grants from the province of Manitoba and is administered at the community level. Actual operations are usually undertaken by a local organization that deals with the handicapped. Available ridership and cost data are discussed. Problems encountered in attempting to estimate the number of potential users are examined along with possible conflicts with local taxi and ambulance services. The advantages and disadvantages of working through local governments are outlined. It is concluded that it is possible to provide a satisfactory level of service at reasonable cost in areas where it is traditionally considered difficult, if not impossible, to provide such services.

A key element in bringing the elderly and the handicapped into the mainstream of community life is the provision of adequate transportation services. In recent years there have been a number of advances in this field, but they have been largely confined to urban areas or heavily populated rural areas, and little has been done in small towns and rural municipalities. Although the need for transportation of the elderly and the handicapped in urban areas in the province of Manitoba has not been neglected, steps have been taken to provide service to those in lightly populated rural areas as well.

In its early years Manitoba was an agricultural province, with a majority of the population living on farms or in small rural towns. Since the turn of the century there has been a shift to urban living, until today about 70 percent of the population lives in a few large urban centers and the remainder on farms or in small communities. Outside the city of Winnipeg, which has more than half the province's

population (578,000) and a few other small cities such as Brandon (34,901), Portage la Prairie (12,555), and Thompson (17,291), there are few public transportation facilities, and even local taxis are rare. Under such circumstances the elderly and the handicapped who cannot drive or do not own an automobile are dependent on friends and relatives or become virtual shut-ins.

At first glance the problems of providing an organized and effective transportation service for a small user group spread over a wide area appeared almost insurmountable. The initial impetus to do something came from handicapped persons. Their perseverance, coupled with the help of service clubs and other community-minded citizens, municipal governments, and the Department of Highways and Transportation, has resulted in a program designed to meet the unique needs of rural Manitoba.

BACKGROUND

The first organized attempts to provide transportation for the elderly and the handicapped in rural Manitoba came in the mid-1970s when a number of local programs were started with federal funding under Canada Works grants. These projects demonstrated the need for service tailored to the needs of the elderly and the handicapped and delivered through broad community involvement, in a financial and administrative sense. When Canada Works funding was terminated, the local municipalities and various charitable and service organizations that had par-