

# B.M.R. COMMENT



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Suite 406, 4 Richmond St. E., Toronto 1, phone 363-9265

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## PUBLIC TRANSPORTATION PLANNING -- MAKING IT EASIER FOR THE ELDERLY

Public transportation is an essential urban service and a highly expensive one. Its success depends upon volume use at low cost. Yet improvements needed to attract rides can be costly and easily self-defeating. In an effort to maximize the number using the system while holding costs down, transportation planning has tended to cater strongly to the majority. This means, at least in the large metropolis, emphasizing commuter services and planning new facilities for corridors of highest trip volume. These are sound goals -- but should they be the exclusive goals of a public transportation system?

To improve transportation planning, planners must, we suggest, move away from virtually exclusive preoccupation with trip volume. Trip volume can be a useful indicator, but as an exclusive indicator of travel demand, it has at least two major fallacies: 1) It imposes present travel habits on future populations, and 2) It neglects total unmet travel demand, which the public authority should seek to discover and provide for.<sup>1</sup>

To maximize the number of people using transportation, more attention must be paid to creating systems with maximum accessibility and to discovering how to meet presently unmet travel demands. When little or no attention is paid to these goals, a number of population groups which are actually subsidizing transportation through taxes are discouraged from, or even prevented from, using this public good. Such groups include the elderly and the handicapped. Furthermore, many of the groups discouraged from using public transit by the difficulties they encounter when trying to use it are unable to use private transport -- the automobile, -- and must manage as best they can -- (mainly as pedestrians.) In addition to the elderly, these groups include people on low incomes or

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For a fuller critique of the trip volume approach to transportation planning, see Bureau of Municipal Research, Transportation: Who plans? Who pays?, Civic Affairs, Autumn 1970, p.8 and pp. 17-19.

people who for other reasons are non-drivers.

Transportation planning must begin to take these special groups into account and attempt to maximize their access to transport. For it is possible that, as Victor Papanek says, "If we then 'lump together' all the seemingly little minorities..., if we combine all these 'special' needs, we find that we have designed for the majority after all."<sup>2</sup> Most of the time, Papanek contends, industrial designers -- and this would include designers of public transit vehicles -- design for a very small part of the population indeed:

The ideal consumer is between eighteen and twenty-five, male, white, middle-income, and if we look at ergonomic data published by designers themselves, exactly 6 feet tall, weighing exactly 185 pounds.<sup>3</sup>

What steps must be taken by transport planners who want to create maximally accessible systems? This COMMENT will concentrate on what should be done for one of the groups which is at present discouraged in a number of ways from using public transit yet which is dependent on it -- the elderly. It will focus therefore upon public transit planning rather than upon total transportation planning.

#### Summary of Activities Needed

To find out what needs are unmet or what changes are required the following things should be done: a) types and directions of trips taken by the elderly should be studied, b) deficiencies in existing services should be examined and c) the elderly should themselves be included within the planning team.

It is a wise policy to install only new systems that fully accommodate special groups; it is far more costly to make changes after systems are built. Nevertheless, modifications should be made to older systems whenever possible.

#### Transportation Needs of the Elderly

As compared with the rest of the population, the elderly have less energy, thus less motivation to make any given trip;

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Victor Papanek, Design for the Real World (New York: Pantheon, 1971), p. 57.

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Ibid., p. 100

their frustration level is lower.<sup>4</sup> There are several reasons for this lower frustration level. Increased age often brings a progressive slowing-down in sensory faculties of sight and hearing and a slowing-down of motory skills and reaction-time. For the elderly, adaptation to unpredictable situations means paying a higher price through stress. Thus, on the whole, increasing age is accompanied by decreased trip-taking. Decreased trip-taking with increased age is in fact a finding of a study by Stephen Golant based on 1964 Metropolitan Toronto and Region Transportation Study (MTARTS) data.<sup>5</sup> This phenomenon, then, has been shown to take place in Toronto.

It may be questioned whether it is really important to seek to counter this slow-down in trip-taking. In response, gerontological theories indicate that the elderly may progressively give up contacts with the outside world and live rather empty, death-oriented lives unless otherwise encouraged. The general transportation need of the elderly, then, is for transportation systems made accessible to them by reductions in frustrations inherent in the systems. In Toronto, public transit should be made attractive to the elderly, since they are in large part a captive public transit user group. In 1964, only 23.7% of the 65+ population had drivers' licenses.<sup>6</sup>

Most studies show dramatic increases in trip-taking among the elderly when travel barriers such as price or inconvenience are removed. Closeness to bus-stops, for example, is accompanied by more frequent trip-taking.<sup>7</sup> Reduced fares for the elderly were initiated in January 1970. Unfortunately, no data indicating the effect of this change on the use of the system by the elderly are available.

Golant's study shows the types of trips needed by the elderly. Types of trips taken were, in the following order: shopping, social, personal business and recreational. The car was more important for the social and recreational trips (the elderly were probably driven by others on visits); and public transit was more important for shopping and personal business.<sup>8</sup> Since Golant also mentions that closeness to a small grocery store is an important factor in the residential location of the elderly, it is

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Stephen M. Golant, The Residential Location and Spatial Behaviour of the Elderly: A Canadian Example, University of Chicago Geography Department. Research Paper No. 143, (Chicago: University of Chicago Press, 1972), p. 134.

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Ibid., p. 196.

6

Ibid., p. 155.

7

Ibid., pp. 135-136 and p. 140.

8

Ibid., p. 162.

likely that the main types of trips taken on public transit by the elderly are major shopping and personal business trips.

Surprisingly, Golant's study does not mention the category of medical trips, which are of course quite important. Medical trips can be made by car or by public transit; but the type of travel mode most suitable for medical trips may be another type of transportation -- a dial-a-bus or van vehicle.

#### Transportation Problems or Travel Barriers

Besides a general need for transportation differing from that of the rest of the population and needs for specific types of trips, problems with the present transit system -- barriers to its full use -- may be gauged for the elderly.

A major, if not the major problem for the elderly is non-adherence to the transit system's schedule. About 60% of the elderly's trips are taken between 9 a.m. and 4 p.m., that is, outside the rush hours. At such times the schedules are the least reliable. Often long, tiring waits at bus-stops or even subway stations must be endured. Another major system problem is a lack of easily available information on schedules, fares, transfer procedures.

Other problems can be categorized as strict design problems or as subjective problems for which solutions may be found in design terms.

1) Design barriers. Most of these barriers are omissions of desirable features; for instance a lack of desirable alternatives to long flights of stairs. Not all subway stations have escalators. The optimal solution (especially for maximum accessibility to the handicapped) would be elevators at each subway station, or powered lifts -- platforms or chairs -- attached to the outside of escalators. With buses, there is a similar problem with high steps, although there is some evidence that the bus is more usable by the handicapped than the subway.<sup>9</sup> Bus steps can be made smaller and collapsible, to convert into platforms for wheelchairs. Or platforms level with the bus floor could be built at bus-stops. Otherwise, the bus could be re-designed so that its floor level would be lowered to curb level.<sup>10</sup>

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Abt Associates, Transportation Needs of the Handicapped: Travel Barriers, for the U.S. Department of Transportation (Washington, D.C., U.S. Department of Commerce Clearinghouse, August 1969), p. 95.

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Many of these and following suggestions were taken from the Abt Report. Although the elderly and the handicapped may subjectively experience slightly different problems with transit systems, most of their problems have common, design solutions, (See pp. 166-173 of the Abt Report).

For the elderly narrow aisles and doors should be widened. Doors which shut too fast or require pushing to open should be re-designed. Stanchions and hand grips should be available wherever it is necessary to stand up or sit down. Toilet facilities, some of which should be designed for wheelchair users, should be available at all transit depots. Benches should be built at each bus-stop.

Presently there are either no shelters or inadequate shelters at bus-stops. A completely adequate shelter, according to the Abt Associates Report on Travel Barriers, would include infra-red heat, over-head lighting, a splash guard, a ticket machine, room for wheelchairs and a indication of next departure time.<sup>11</sup>

2) Subjective barriers. Such barriers might fall into five main categories:

a) Crowds. Elderly people have little tolerance for moving in crowds and being propelled along by them. They find it difficult to stand on a crowded vehicle. Some design approaches to this problem are: 1. priority seating for the elderly, handicapped, mothers.etc., 2. more doors on transit vehicles, with some clearly marked for exit, some for entrance, 3. special walklanes and queuing systems, 4. platform marks for stopping vehicles at exact boarding spots.

b) Jerkiness and movement problems. This category covers the problem of maintaining balance during acceleration and deceleration and of moving towards vehicle doors while the vehicle itself is moving. Some design approaches are: 1. warning mechanisms attached to brake and steering systems which flash whenever jerky movements occur, 2. handgrips, 3. use of bus lanes to cut down unexpected traffic maneuvers, 4. padded surfaces, 5. improved suspension, 6. arrangement of seats and doors so that little walking must be done from the seat to the door while the vehicle is moving.

c) Walking long distances. Some design approaches are: 1. people conveyor belts, 2. internal station vehicles (mini-trains) on marked travelling lanes parallel to pedestrian traffic.

d) Confusion over schedules and directions to platforms, etc.  
1. illuminated boards, tv's for departure, platform information,  
2. audible sounds -- beeps or pulses, not loudspeakers -- with frequencies which guide people down correct corridors, 3. tactile, floor texture patterns as guides, 4. public transit aides.

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Ibid. p. 135.

e) Need to hurry. This problem, as the Abt Report points out, is related to the need to maintain transit schedules. It could be lessened by 1. eliminating bottlenecks at fare collection spots by the use of passes, electronic meters to count people passing onto the vehicle, dispersing fare collection to points of the trip other than entry or disembarking, credit cards, ticket machines, etc., 2. making complete information available on departure times and pedestrian direction.

Most of these problems, faced by the elderly, have been uncovered by extensive surveys and studies. It should be noted that no such survey has been carried out in Toronto. Only one limited survey is available to date -- the Soundings One Hundred Persons Conference for senior citizens and people involved in senior citizen services.<sup>12</sup> It resulted in thirty-seven separate comments on desired modifications to transit services.

The Abt Report suggests excellent guidelines for maximally accessible transport, but if there is any reason to believe that the Toronto situation differs significantly from the Boston situation, on which the Abt Report was based, an extensive sample survey should be carried out. It could be done by asking for unstructured comments and then categorizing them; by running films simulating trips and asking about problems at each stage (as did the Abt Report); or by asking for total trip problems, with total trip broken down by stages (home to station, mounting vehicle, riding in vehicle, disembarking, vehicle to destination.)

Such a survey could be usefully incorporated into the work of the Metropolitan Toronto Transportation Plan Review, which is performing a broad survey of transit desires and needs in the area. Other "captive" groups could be similarly surveyed. Or it could be carried out by the new Mayor's Task Force Re.Disabled and Elderly, chaired by Mr. Gerald F. Clarke, President of the Ontario Federation of the Physically Handicapped and co-chaired by Alderman Anne Johnston.

#### What Are The Feasible Solutions?

Now that the range of problems and needs for transit of the elderly has been briefly surveyed, it remains to be seen which of the many modifications are feasible and/or suitable. If the approach is taken that there is a budget ceiling on transit spending, it will be advisable to set up priorities for change in the system.

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Co-sponsored by the Social Planning Council, the Ontario Welfare Council Section on Aging and Community Care Services (Metro Toronto) Incorporated. Copies available at the Social Planning Council. For a Social Planning Council Report of the general situation of the aging (including sections on housing, income and services), see The Aging, A Special Report in the Trends Series 1972-73 (Toronto, March 1973)

The Abt Report offers "A Locally Applicable Technique for Guideline Selection," which helps to determine what modification combinations will be most effective helps in reducing or eliminating transit barriers. The premise is that barriers occur in groups, not singly. Eliminating one barrier might have absolutely no effect at all unless a number of other barriers are eliminated at the same time. Reproduced in an Appendix are Abt's grids of effective barrier removals for bus and subway transit.

Again, there may be some problem deciding whether a special separate transportation system for the elderly and handicapped such as a Dial-a-bus type of system or a van mode may not be preferable to changing the general public transit system. (This approach seems to be favoured by the T.T.C. although there is no firm T.T.C. policy statement on this). If this other mode were developed with no changes made to the public transit system, the result could be a further isolation of the elderly and handicapped. It would probably be better to do both: to develop a separate mode and to improve public transit. Since this Comment has dealt with primary public transportation, it has concentrated on the latter. The evidence has shown that another mode could be quite useful for social/recreational trips, while public transit would continue to be used for major shopping and personal business trips.<sup>13</sup> Such a special service would also be useful for medical trips of those unable to use any other transit mode.

Finally, exercises in modification tradeoffs should be carried out only if the premise that there is a budgetary limit to what can be done is accepted. With provincial and federal governments increasingly willing to play an active part in financing, this seems to be less and less the case. The Bureau emphasizes that all public transit is a subsidy to users, not just transit with facilities for special needs groups. It is rare that public transit pays for itself. Secondly, the Bureau recommends that the goal of maximum accessibility to public transit be recognized on a continuing basis. Since this may not come about spontaneously, the Bureau suggests that special needs groups might band together to present a common brief in favour of maximum accessibility. And lastly, the Bureau reminds the reader that solving the transit problem does not solve the entire problem for the special needs groups. For, as Louis Gelwicks says

Very little is really accomplished by widening the door...at...a downtown restaurant...if the...person cannot negotiate the steps in his own apartment, has no means of getting downtown, cannot negotiate curbs, or is afraid to cross a street because the pedestrian's right of way time is so short.<sup>14</sup>

<sup>13</sup> Golant, Residential Location and Spatial Behavior, p.162.

<sup>14</sup> Louis Gelwicks, "The Older Person's Relation with His Environment", Transportation and Aging, pp.159-161.

APPENDIX

MAXIMIZING THE EFFECTIVENESS OF BARRIER REMOVAL

If some but not all barriers are to be removed, an effort must be made to remove barriers which are the most burdensome. Practically speaking, this means removing combinations of barriers rather than individual barriers. People are always faced with several obstacles rather than with just one. For example, people unable to use stairs may also be unable to walk long distances.

The Abt Report on Travel Barriers,<sup>1</sup> basing its grids on information from a sample of 212 aging and handicapped persons in Boston, offers these grids to show the effect of removing combinations of travel barriers. On the subway grid, for instance, it is indicated that removing sudden movements, adding grips in addition to overhead grips, removing the need for rapid self-locomotion, long stairs and the need for movement in crowds barriers will make the system accessible to about 37% of the handicapped population; adding the removal of the quick rise from seats barrier makes it accessible to 45%. Using grids such as these makes transportation planning for special needs groups more efficient.

Subway Barriers

EFFECTIVENESS INDEX	Sudden Movement	Overhead Grip	Rapid Self Locomotion	Long Stairs	Movement in Crowds	Rise from Seat	Escalator	Turnstile	Short Stops	Long Walking Distances
E										
97	x	x	x	x	x	x	x	x	x	x
84	x	x	x	x	x	x	x	x	x	
78	x	x	x	x	x	x	x	x		x
71	x	x	x	x	x	x	x	x		
71	x	x	x	x	x	x		x	x	x
64	x	x	x	x	x	x		x	x	
58	x	x	x	x	x	x		x		
58	x	x	x	x	x			x	x	x
51	x	x	x	x	x	x			x	
49	x	x	x	x	x			x		
45	x	x	x	x	x	x				
37	x	x	x	x	x					

<sup>1</sup> Abt Associates, Transportation Needs of the Handicapped: Travel Barriers, for U.S. Department of Transportation (Washington, D.C.: U.S. Department of Commerce Clearinghouse, August 1969). Grids from p.159 and p.160.



Bus and Trolley Barriers

EFFECTIVENESS INDEX	Sudden Movement	Ride Standing	Rapid Self Locomotion	Movement in Crowds	Wait Standing	Short Steps	Rise from Seat	Aisle Width	Long Walking Distances
99	x	x	x	x	x	x	x	x	x
94	x	x	x	x	x	x	x	x	x
80	x	x	x	x	x	x	x	x	x
77	x	x	x	x	x	x	x	x	x
67	x	x	x	x	x	x	x	x	x
61	x	x	x	x	x	x	x	x	x
60	x	x	x	x	x	x	x	x	x
55	x	x	x	x	x	x	x	x	x
51	x	x	x	x	x	x	x	x	x
48	x	x	x	x	x	x	x	x	x
42	x	x	x	x	x	x	x	x	x
35	x	x	x	x	x	x	x	x	x