

reservation times, require users to negotiate short distances from the house or destination to the vehicle, and have pickup times selected by the user rather than at preset times. These attributes describe demand-responsive service and imply that, from the users' perspective, such service is of superior quality to fixed-route service. Route-deviation service would also rank higher than fixed-route service by the sample of users.

The analysis of attributes also indicates that high-quality services ensure that users can obtain clear information on how to use the service, that the telephone operators are courteous and friendly, and that all users have a guaranteed seat or location for a wheelchair.

This analysis implies that the provision of high-quality transportation services for the elderly and the handicapped is complex and involves careful management of a variety of service attributes. Much planning, organization, and control are needed to ensure that high-quality services result.

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## Inquiry of the Canadian Transport Commission into Intercity Bus Travel for Disabled Persons in Newfoundland

M.S. FLEMING AND D.B. SILVERSTONE

The objective of the paper is to (a) demonstrate how the Canadian government, acting through a regulatory body [the Canadian Transport Commission (CTC)], approached one particular issue under federal jurisdiction concerning transportation of the handicapped, and (b) present the results of its action. The issue discussed is the intercity bus service for disabled persons on the Island of Newfoundland, which is located off the eastern coast of the Canadian mainland. The Island has a population of approximately 536,000 and is the most densely populated part of the province. The intercity service currently is provided by CN Roadcruiser, a crown agency. The inquiry (the approach chosen to investigate the issue) is described, and the findings, along with the subsequent action taken by the CTC, are given. Terms of reference of the inquiry included consideration of the most efficient service for able-bodied and disabled persons alike. The primary finding was that the use of lift-equipped buses in the regular Roadcruiser service was not the appropriate course of action. Recommendations made in the report of the inquiry were adopted by the Motor Vehicle Transport Committee. In the Committee's decision, Roadcruiser was ordered to take specific courses of action that would lead to improvements for disabled travelers on the existing service, and it was recommended that the federal government finance a 3-year experiment to develop a new transportation service that would be an integrated service, but focused on the transportation requirements of disabled persons.

The accessibility of intercity bus service for disabled travelers appears to be an issue of higher profile in Canada than in the United States. The interest in Canada may be attributed, at least in part, to the interaction of two mutually exclusive events that have taken place or are taking place in the field of transportation in Canada.

The first event is the increasing reliance on bus service as a substitute for passenger train service for relatively short-distance intercity travel. In the province of Newfoundland, bus service replaced passenger train service in 1968.

The second event is an increasing effort on the part of the rail mode to accommodate nonambulatory persons and to encourage them to travel independently without an attendant. This effort commenced in earnest after a decision in March 1980 by the Railway Transport Committee (RTC), a modal committee of the Canadian Transport Commission (CTC). The

decision (1) ruled that, in effect, the railways had to accept the nonambulatory disabled person's judgment as to whether or not he was self-reliant and, therefore, whether or not he required an attendant. At the same time the RTC ordered manual lifting at all major stations across Canada and other measures to make rail travel more accessible. Thus this case set a precedent by the Canadian government to take an active part in removing physical barriers to travel by disabled persons.

The focus of this paper is on the intercity bus service for disabled persons on the Island of Newfoundland, which constitutes the most populated area of the province of Newfoundland. CN Roadcruiser, which is regulated by the CTC through its modal committee--the Motor Vehicle Transport Committee (MVTC)--provides a cross-Island intercity bus service. The procedure that the CTC chose to study the service was by inquiry; included in the paper is a description of the inquiry as well as its findings and recommendations (2).

#### PARLIAMENTARY COMMITTEE AND THE INVOLVEMENT OF THE CTC

The involvement by the CTC in the issue of accessible buses was activated by a report on disabled and handicapped persons produced by the Special Parliamentary Committee. The Committee was formed in 1980 and was made up of seven members of Parliament. They held hearings across Canada in order to "identify key obstacles faced by disabled persons in Canada, and to outline practical actions which will help overcome these obstacles."

In February 1981 the Parliamentary Committee's report "Obstacles" was issued (3). Their recommendations covered virtually all aspects of goods, services, and facilities provided to the public, and focused principally on matters falling within federal jurisdiction.

With regard to intercity bus services, the Parliamentary Committee addressed itself to the Roadcruiser service, in that it is the only service within federal jurisdiction. Insofar as the service is not accessible to disabled persons in wheelchairs, the Committee's Recommendation 86 was to the effect that, as a first objective, disabled persons in Newfoundland should be ensured access to at least one regularly scheduled bus each way, traveling both east and west. In their report the Committee requested that the CTC require CN Roadcruiser in Newfoundland to provide a mechanical facility or a service for lifting people in wheelchairs on and off the vehicles. It was also stated in the report that, "these recommendations, which apply specifically to Roadcruiser buses in Newfoundland, should also be applied to other inter-city buses travelling major routes across Canada, which fall under federal jurisdiction" (3).

#### THE CTC: ITS ROLE AND FUNCTIONS

The CTC came into existence in 1967 through the enactment of the National Transportation Act (4). It is an independent regulatory federal agency, and it shares with Transport Canada (the Canadian department of transportation) the regulation of all modes of transport under federal jurisdiction. The CTC operates through six modal committees: Railway Transport Committee (RTC), Air Transport Committee (ATC), MVTC, Water Transport Committee (WTC), Commodity Pipeline Transport Committee (CPTC), International Transport Policy Committee (ITPC), and a review committee. In 1980 the CTC also appointed a Special Advisory Panel on Transportation of the Handicapped.

In general, the focus of the modal committees is on economic regulation, such as rate regulation and service, on carriers under federal jurisdiction. Specifically, the RTC regulates safety, service, and rates on all interprovincial rail lines; the ATC regulates rates, service, and licensing on all air carriers (Transport Canada regulates safety); the MVTC regulates rates, service, and safety on the CN Roadcruiser bus service in Newfoundland (the provinces regulate service, rates, and safety on all other intercity bus services); and the WTC regulates service and safety on some inland vessels on certain inland waterways. As the name implies, the Special Advisory Panel focuses its attention on transportation service for the handicapped and the extent to which disabled persons might be better accommodated on the various modes under CTC jurisdiction within the principles set out in national transportation policy. As an advisory body, the Special Advisory Panel has multimodal jurisdiction and provides services to all committees. Its power is limited to carrying out investigations and submitting recommendations to the modal committees for action.

The CTC is a court of record with all the powers of a superior court with respect to the calling of witnesses, the production and inspection of documents, the enforcement of its orders, and the entry and inspection of property. It can act on complaint or on its own motion. Before ruling on a particular issue it may decide to hold (and in some cases must hold) a public hearing. Nevertheless, the Commission is not required to act only through the hearing process. The National Transportation Act provides for more informal channels for obtaining information. For example, the Commission may appoint inquiry officers to investigate any matter on which it has jurisdiction. This was the route chosen by the MVTC when faced with Recommendation 86 of the Parliamentary Committee report.

#### ENVIRONMENT OF NEWFOUNDLAND AND NATURE OF INTERCITY BUS SERVICE

Newfoundland is an island located at the mouth of the St. Lawrence River in the Atlantic Ocean off the eastern coast of the Canadian mainland. The province of Newfoundland includes the Island plus a portion on the mainland known as Labrador. The inquiry, however, was limited to the intercity bus service on the Island.

In 1981 the population of the Island was 536,363, nearly 45 percent of whom lived in the southeastern corner in the Avalon Peninsula. More than 60 percent of the population of the Avalon Peninsula, in turn, lived in the center or suburbs of the province's capital city, St. John's (population 154,820). The next city of any size is Cornerbrook (32,264), which is located on the west-central coast of the Island. The distribution pattern of the Island's population is shown in Figure 1, which relates specifically to the distribution pattern of disabled persons.

The terrain of the Island is picturesque but rugged. The coastline is hilly, and there are innumerable inlets along the 6,000 miles of coastline, with each inlet separated from its neighbor by a steep ravine. Much of the interior is barren with vast expanses of bogland intermixed with hard rock. The climate is unpredictable because of the Island's exposure to midlatitude storms moving across Canada and up the Atlantic seaboard. The south and southeastern portions of the Island experience periods of dense fog caused by the mixing of the cool air associated with the Labrador current and the warmer air of the Gulf Stream.

Characteristic of the settlement pattern is the location of a small independent fishing village or

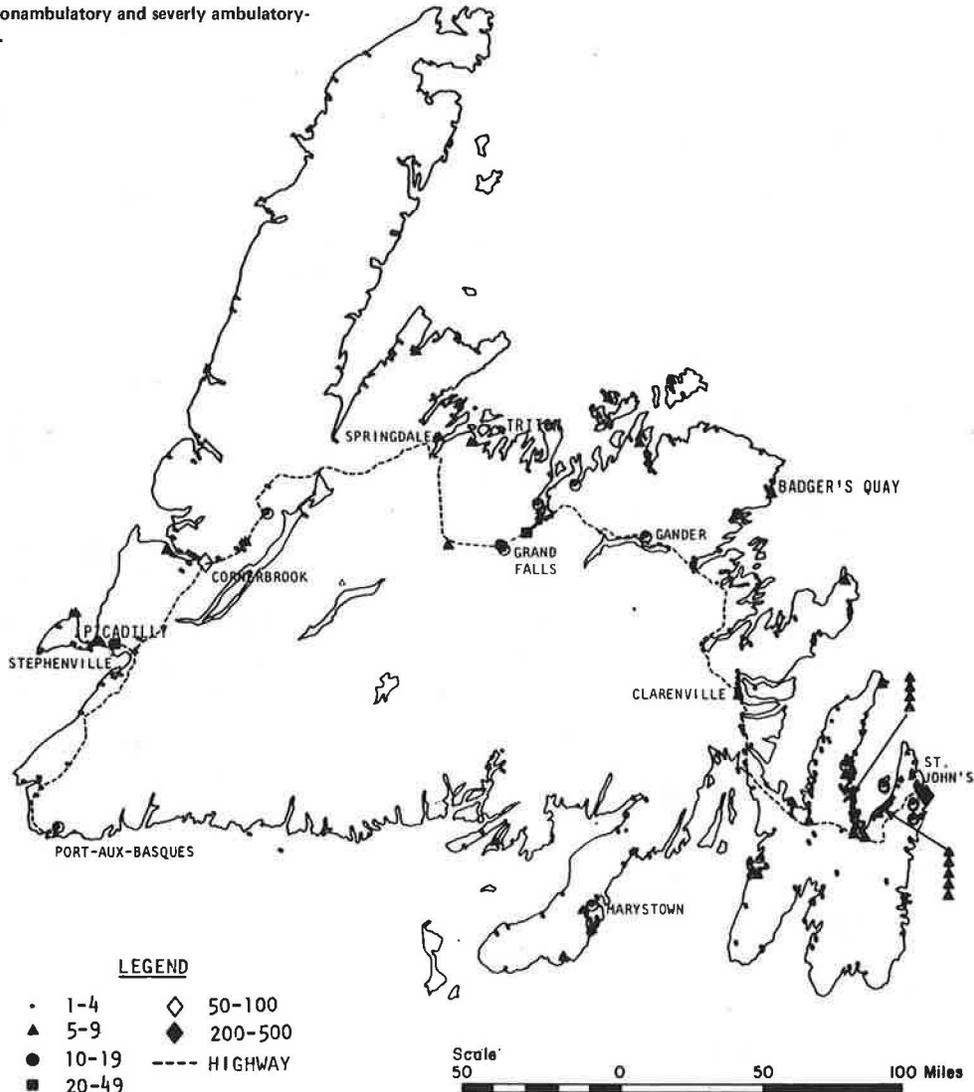
outport at the head of an inlet. Many of the roads that link these outports with other outports and with the Trans-Canada Highway are narrow and rough. The intercity bus service operates only on the Trans-Canada Highway, which crosses the center of the Island, extending from Port-aux-Basques in the southwest corner to St. John's in the Avalon Peninsula in the southeast. This intercity service is operated by Roadcruiser, a subdivision of Terratransport, which is a subsidiary of Canadian National Railways (CN), a crown agency.

The Roadcruiser service connects the major centers across the Island. An element of the bus operation, and indeed of most intercity bus travel, is the use of numerous drop-off locations (there are 34 stops on the trans-island route, two of which are meal stops of 30 min each, and the rest a maximum of 10 min). Many of these stops are without extensive facilities. In fact, most station stops do not belong to Terratransport; rather, they consist of small stores and restaurants. The service is run on several schedules, with slight deviations in some areas and on some routes. Keeping to the schedule is essential to Roadcruiser's operations, especially

the trans-island schedule, which already takes 15 hr. An important consideration is that the driver of the Roadcruiser is not permitted to make up for time lost at station stops by increasing the driving speed above the speed limit between stops. The time, including the time spent at station stops, is automatically recorded on a card that is submitted at the end of the trip.

The service in question is seen by many as a replacement for rail passenger service that, as mentioned previously, was ordered discontinued in 1968. Because of this, intercity bus operations in Newfoundland are often compared with intercity rail services. However, rail has certain advantages inherent in its operation that make it more adaptable to providing access to nonambulatory and severely ambulatory-impaired persons. Railway stations can be equipped with station-based lifts at many locations, something not feasible in many bus operations, given the nature of the drop-off points involved. Bus operations, however, have the flexibility inherent in their equipment to deviate from the route, and such flexibility increases with smaller buses.

Figure 1. Distribution pattern of nonambulatory and severely ambulatory-impaired persons in Newfoundland.



SOURCE - Children's Rehabilitation Centre, St. John's, Newfoundland, July, 1981.

## INQUIRY INTO INTERCITY BUS SERVICE IN NEWFOUNDLAND

There are no specific provisions in the National Transportation Act and other legislation that the CTC is authorized to administer respecting service to the handicapped. Under the National Transportation Act, however, the MVTC is responsible for regulating service on the Roadcruiser to the public. As such, the MVTC, as well as the Commission's Special Advisory Panel, was interested in Recommendation 86. Both the Committee and the Special Advisory Panel agreed in principle that disabled persons should have access to regular bus service, but it was believed that an investigation was required to examine the extent to which the installation of mechanical lifts on the Roadcruiser buses would serve the needs of disabled persons for intercity travel in Newfoundland. An in-depth examination of other, more appropriate types of services or viable options and the cost implications of implementing them was believed to be a prerequisite to the ordering or institution of any service.

The MVTC and the Special Advisory Panel also agreed that the investigation should be carried out in an informal manner through public and private meetings as opposed to the more formal course of public hearings.

Accordingly, on the recommendation of the MVTC, the president of the CTC duly appointed on March 31, 1981, two inquiry officers, pursuant to Section 81 of the National Transportation Act. The terms of reference stated, *inter alia*, that the inquiry officers were to inquire into and report "on the relative merits of the various options available which would have the effect of rendering the Roadcruiser bus service in Newfoundland accessible to disabled travellers, with a view towards finding the service best suited to their needs, while taking into account the cost implications of all of the options under investigation."

Although the scope of Recommendation 86 was limited to persons in wheelchairs (i.e., nonambulatory persons), the inquiry included in its terms of reference persons who were able to walk but had some mobility problems, such that it was difficult, if not impossible, to board an intercity bus without assistance. The principal focus of the inquiry, therefore, was aimed at two groups: nonambulatory and severely ambulatory-impaired persons.

The inquiry also addressed the needs of ambulatory-disabled persons, including the deaf and the blind. These persons could board the bus with difficulty, but did not require the use of a lift.

### Nature and Format of Inquiry

As previously noted, the inquiry was conducted on an informal basis as possible, keeping in mind the methodology set out in the terms of reference that the inquiry would be conducted by discussions and meetings in order to solicit the views and obtain the facts from the appropriate persons, agencies, and governments concerned.

The largest part of the inquiry centered around public and private meetings with disabled persons in Newfoundland. Eight of the nine public meetings were held in major centers along the Roadcruiser route, and one public meeting was held off the route in the Burin Peninsula. The locations of the nine centers are shown in Figure 1; they include St. John's, Marystown (in the Burin Peninsula), Clarenville, Gander, Grand Falls, Sprindale Junction, Stephenville, Cornerbrook, and Port-aux-Basques.

Persons attending the public meetings included private individuals, groups and organizations repre-

sented disabled persons [such as the Consumer Organization of the Disabled People of Newfoundland (COD); the HUB, an organization of handicapped persons providing services; the Canadian Paraplegic Association (CPA); Group of Seven, and staff of the provincial Department of Social Services], and representatives from the Roadcruiser service. In addition, there was representation from ambulatory-disabled persons, including the deaf and the blind.

The private meetings were held in the homes of disabled persons. Persons visited there were so severely disabled that they were unable to attend the public meetings. The smaller communities where home visits were made included Badger's Quay, Triton, and Picadilly (see Figure 1 for their location).

Information obtained from the public and private meetings in Newfoundland was supplemented with information gained from the results of a questionnaire prepared within the CTC (see Figure 2). The questionnaire was distributed at the meetings and subsequently by the regional directors of the Newfoundland Department of Social Services on behalf of the CTC. Information from the questionnaire was the primary source for estimating the users and potential users of an intercity bus service for the disabled. Finally, to obtain as full an understanding as possible of how disabled persons viewed intercity bus travel, meetings were held with disabled persons living outside Newfoundland, some of whom had had experience riding on an intercity bus.

### Summary of Views Expressed at Public Meetings by Organizations or Groups Representing Disabled Persons

Basically, the same position was put forth by the organizations and groups representing disabled persons at each of the public meetings that they attended. The essential points brought forward are summarized as follows.

1. The lift-equipped bus was seen as a concrete embodiment of the principle of integration and equality. Segregation by means of a special system was seen as a regressive step, even assuming the special system provided a superior service to that provided for able-bodied persons. The principle of integration was more important than the numbers of handicapped who would use the service. In fact, the question of numbers was seen by the groups representing disabled persons as irrelevant. The issue was not how many would use the service, but that disabled persons would have the same option as able-bodied persons to mass transportation. This was seen as the right of disabled persons.

2. The lift-equipped bus and the integration of disabled with able-bodied persons was seen as therapy for disabled persons. A comment was made to the effect that "handicapped people who were kept separate were kept handicapped."

3. It was believed that the lift-equipped bus could have special benefits for other groups, such as the aged, pregnant women, and the temporarily handicapped. The cost, therefore, would be offset by the number of people who would be helped.

4. The issue of costs, however, was seen as irrelevant by the groups in question. If the technology existed to adapt the intercity bus with a lift, it should be done regardless of costs.

5. A separate system was seen as a duplication of services, expensive, and "pie-in-the-sky".

6. Manual lifting was seen as a kindness rather than a responsibility and, in the opinion of the groups representing disabled persons, a manual lifting program did not make the bus accessible. The

point was made that manual lifting was unrealistic and dangerous and, moreover, it was degrading to the disabled person.

7. The issue of the accessibility of the feeder systems was seen as being irrelevant to the inquiry. It was pointed out that disabled persons had the same problem as able-bodied persons in getting to the terminal.

8. Incidental to equipping buses with lifts was the necessity to make terminals accessible.

Summary of Views Expressed by Disabled Persons at Public Meetings or Privately in Their Homes

The most striking aspect of the meetings with disabled persons, who expressed their individual concerns, was the diversity of disabilities and the obvious effects this would have on a person's choice

of transport and on the operation of the service itself.

In some instances the severity of the disability was so great that it was evident that the person could never travel on a lift-equipped bus or otherwise. In other instances the needs of disabled persons were obviously different from the needs of able-bodied persons, inter alia, the need to stop more frequently because of tiring or to use toilet facilities and the requirement for a longer meal stop. At the same time some disabled persons could use the scheduled Roadcruiser service, requiring assistance only at the beginning and end of the trip. On the question of whether a lift or some manual assistance (apart from actual manual lifting) was necessary, there was a divergence of views. Some persons, even those in wheelchairs, could get on the bus by the stairs with some assistance and therefore

Figure 2. Questionnaire sent to disabled persons about the accessibility of the Roadcruiser service.



Commission canadienne  
des transports  
Ottawa, Ontario  
K1A 0N9

Canadian Transport  
Commission

Questionnaire on the Accessibility of  
the Roadcruiser Service to the Disabled

The purpose of this survey is to gather information about the transportation requirements of the disabled who have difficulty getting on and off the Roadcruiser.

PLEASE MARK THE APPROPRIATE BOX WITH AN

NAME: \_\_\_\_\_  
(optional)  
ADDRESS: \_\_\_\_\_  
\_\_\_\_\_

1. Which of the following mobility aids do you use?
  - Wheelchair
  - Crutches
  - Other (please specify) \_\_\_\_\_
  - None
2. Do you own or have access to a car?
  - Yes
  - No
3. If the answer to question 2 is yes, do you drive the car yourself?
  - Yes
  - No
4. How far do you live from a Roadcruiser Bus Terminal?
  - Less than a mile
  - 1 - 5 miles
  - 5 - 10 miles
  - More than 10 miles
5. Do you use the current Roadcruiser Service?
  - Yes
  - No
6. If the answer to question 5 is yes, how much difficulty do you encounter getting on and off the bus?
  - None
  - Slight
  - Moderate
  - Need Assistance
  - Need Manual Lifting
7. If the answer to question 5 is no, please indicate the reasons by checking one or more of the following:
  - Do not travel
  - Have alternative means of transportation
  - Bus journeys are too long
  - Bathroom facilities are not accessible
  - No transportation to terminal
  - Inadequate facilities at terminal
  - Other (please specify) \_\_\_\_\_

did not need the lift, but some of the persons preferred, or were required, to sit in their wheelchair while on board. In other cases parents preferred to carry their children on board. This diversity of disability is further emphasized by the answers received in many of the questionnaires.

The issue of integration appeared relatively unimportant when talking to disabled persons on an individual basis. Those individuals who were thoroughly integrated into the life of the community did not appear to have a need on a psychological level for an integrated transportation service; also they did not consider it a matter of principle. For them, access to a car was seen as being more impor-

tant than access to the Roadcruiser. Where a car was available, many individuals pointed out that they would not use the Roadcruiser at all, with or without a lift. Nevertheless, others said that, even though they drove a car, they would prefer to use the Roadcruiser in winter when driving conditions were bad.

In many cases disabled persons preferred not to travel at all and, when they did, it was for medical trips only. Nevertheless, in one instance the wife of a person in a wheelchair believed it would be good therapy for her husband to travel, at least for short distances, on the Roadcruiser, although she pointed out that her husband was embarrassed by his

Figure 2. Continued. 8.

Accessible Roadcruiser:

a roadcruiser bus (or buses) would have a lift installed presumably with wheelchair space and tie down available, as well as modifications to the arm rests.

Please indicate your usage of the current Roadcruiser service together with your anticipated usage of each of the suggested alternative services.

		Type of Bus Service	
		Current Roadcruiser	Accessible Roadcruiser
Do you use or would you use these bus services?	Yes	<input type="checkbox"/>	<input type="checkbox"/>
	No	<input type="checkbox"/>	<input type="checkbox"/>
If yes; how frequently?			
	Once a week	<input type="checkbox"/>	<input type="checkbox"/>
	More than once a week	<input type="checkbox"/>	<input type="checkbox"/>
	Once a month	<input type="checkbox"/>	<input type="checkbox"/>
	More than once a month	<input type="checkbox"/>	<input type="checkbox"/>
	Once a year	<input type="checkbox"/>	<input type="checkbox"/>
	More than once a year	<input type="checkbox"/>	<input type="checkbox"/>
when?			
	During the week	<input type="checkbox"/>	<input type="checkbox"/>
	On weekends	<input type="checkbox"/>	<input type="checkbox"/>
	Both	<input type="checkbox"/>	<input type="checkbox"/>
where to?			
	St. Johns	<input type="checkbox"/>	<input type="checkbox"/>
	Marystown	<input type="checkbox"/>	<input type="checkbox"/>
	Clareville	<input type="checkbox"/>	<input type="checkbox"/>
	Gander	<input type="checkbox"/>	<input type="checkbox"/>
	Grand Falls	<input type="checkbox"/>	<input type="checkbox"/>
	Springdale Jct.	<input type="checkbox"/>	<input type="checkbox"/>
	Cornerbrooke	<input type="checkbox"/>	<input type="checkbox"/>
	Stephenville	<input type="checkbox"/>	<input type="checkbox"/>
	Port-aux-Basques	<input type="checkbox"/>	<input type="checkbox"/>
	Elsewhere	<input type="checkbox"/>	<input type="checkbox"/>
Which type of service would you prefer?	None <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	or	<input type="checkbox"/>	<input type="checkbox"/>

10. If you use or would use one of the above types of service please indicate, by checking one or more of the following, the primary purposes of your trips:

- Access to employment
- Medical visits
- Attendance at school
- Shopping
- Recreation
- Other (please specify) \_\_\_\_\_

12. Please indicate any further comments, or make any suggestions as to other types of service, which you feel may assist the Inquiry Officers in their consideration of transportation needs for the disabled in Newfoundland.

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disability. Then again, one mother in Port-aux-Basques said that she believed it would be beneficial for her 12-year-old child to take the bus to Grand Falls. The person in question could board the bus without assistance.

#### Summary of Views Expressed by Users of an Intercity Charter Bus

Meetings with disabled individuals in Newfoundland did not provide much information on actual users of intercity bus; this is understandable in view of the inaccessibility of the service at the time. Nevertheless, it was considered important to talk to persons who had taken an intercity bus journey in a wheelchair and hear from them their capability to travel long distances in this manner, and any difficulties that may be encountered.

Accordingly, meetings were arranged with users of intercity charter buses in Windsor and Chatham in the province of Ontario. In Chatham the inquiry officers interviewed people who indicated the same diversity of disability as was found in Newfoundland. The diversity in disability gives rise to differences in capacity to endure long-distance travel. One woman with multiple sclerosis said that she could endure no more than 1.5 hr of travel. Nevertheless, what was seen as more important than the length of the journey was the ability of the bus driver to stop when he believed it was necessary, and his capability to judge when to make such stops. This involved, on the part of the operator, flexibility of schedule and, on the part of the driver, a thorough knowledge of, and sensitivity to, the disabilities of the individuals being transported.

The views expressed in Chatham were also borne out by representatives at Leboeuf Ltée., an operator of an intercity charter service exclusively for disabled persons between Montréal and Québec (a distance of 120 miles) and between Montréal and Rivière du Loup (a distance of about 290 miles). All three cities are located in the province of Québec. Leboeuf Ltée. has adapted an intercity bus especially for wheelchair use. There are six spaces for wheelchair tiedowns, an accessible toilet, and a Collins model lift in the back. The experience gained from the Leboeuf operation was that the driver's judgment on when to stop, rather than the number of stops, based on his knowledge of the disability of his clients, was a key factor in the operation of long-distance travel involving disabled persons. It was also pointed out by the driver of the Leboeuf charter bus that the bus had to be stopped every time someone had to use the accessible washroom because of the danger, not to mention the difficulty involved, in manipulating an unrestrained wheelchair on a moving bus.

#### CONCLUSIONS OF THE INQUIRY

In the first instance it was concluded that, inasmuch as the Roadcruiser service in Newfoundland was an intercity bus service for the general public, and inasmuch as disabled persons form part of the public, there was a duty on the part of Roadcruiser to accommodate disabled persons as far as it was practical to do so. Nevertheless, at the same time it was evident from the information gathered that the demand by disabled persons for travel on a lift-equipped Roadcruiser service would not be large. Although it was estimated that the number of nonambulatory and semiambulatory persons in Newfoundland might be as high as 7,500, this figure did not represent the number of users or potential users of the service. The distribution pattern of nonambulatory and severely ambulatory-impaired persons in

Newfoundland is shown in Figure 1. Note from this map that many of the estimated 7,500 live in communities that are not on the Roadcruiser route and would depend on a feeder service, none of which are accessible nor do they conveniently coincide with the Roadcruiser schedule. Many others live in communities that had a local bus service or taxi-van service that was more convenient for both able-bodied and disabled persons. Again, many disabled persons would not use the Roadcruiser because of the nature of their disabilities; many preferred, or were required, to use a car, taxi, or other vehicle.

Given the physical and social environment peculiar to Newfoundland, it was concluded that a lift-equipped bus on the regular Roadcruiser service was not the most appropriate form of intercity transportation service for the disabled. This conclusion went against Recommendation 86 in the report of the Parliamentary Committee. The reasons given in support of this conclusion were as follows.

1. A lift-equipped bus(s) in the Roadcruiser service meant fixed-route accessibility; as the name implies, this means that the service lacks flexibility--an essential ingredient in developing a service for disabled persons. The lack of flexibility relates to schedules, routes, and types of vehicles. This flexibility is needed to determine the travel patterns of disabled persons and the location and possible development of the market. Experiences in the United States with urban mass transit systems were studied in this respect (5-7). Although there are important operational differences between intercity bus and urban systems, there were sufficient similarities to enable the inquiry to gain from the American experiences.

2. The most appropriate means of servicing the principle of integration would be to start with the disabled segment of the population; while developing a service in response to their requirements as to the type of vehicle, scheduling, and route, a service could be built at the same time that would include able-bodied persons.

3. Fixed-route accessibility ignores the wide diversity of disabilities and will not, therefore, provide mobility to a significant portion of the persons for whom the service is intended to benefit.

4. Maximum use of fixed-route accessibility depends, in part, on feeder services that are equally accessible; this is not the case in Newfoundland. Smaller buses with flexible routes and schedules can partly alleviate the problem of inaccessible feeder services. The experiences in the United States with regard to urban transit services supported this finding.

5. The need for intercity travel by disabled persons is more for short distances as opposed to trans-island service.

6. There is no regular-sized intercity bus currently manufactured that has a built-in lift. The installation of a lift on these buses is possible, but it would appear that other vehicles, which are suitable for intercity travel, are more suited to lift installations.

7. Both the smaller coach and the van-type bus appear to be a more appropriate vehicle for developing a service to meet the travel requirements of disabled persons. Both types of buses are suitable for use by able-bodied and disabled persons.

#### RECOMMENDATIONS OF THE INQUIRY AND CURRENT STATUS OF THEIR IMPLEMENTATION

The inquiry report was submitted to the MVTC in September 1981, and in December 1981 the MVTC issued

**Table 1. Cost estimate for the introduction of a new service designed to meet the needs of disabled persons for public transportation.**

Item	Cost (\$)
Capital and operating cost of buses	
Capital	
1 medium-sized intercity bus (such as the Orion) at \$160,000	160,000
3 van-type diesel buses (such as the Transette) at \$30,000	90,000
Plus 11 percent provincial sales tax	<u>27,500</u>
Total	277,500
Incremental operating costs	
1 medium-sized intercity bus (such as the Orion)	78,980
3 van-type diesel buses (such as the Transette)	<u>234,920</u>
Total	313,900
Less revenue	
1 medium-sized intercity bus (such as the Orion)	44,000
3 van-type diesel buses (such as the Transette)	<u>58,800</u>
Total	102,800
Net cost of operating the buses	211,100
Net cost of air services <sup>a</sup>	21,800
Annual cost of experiment (less capital cost)	232,900
Total cost of operating experiment for 3 yr [i.e., 3 x 232,900 plus 277,500 (capital cost)]	976,200

Notes: Table gives 1982 cost figures. Data from Eastern Provincial Airways tariff, September 1981; Roadcruiser tariff 1981 (bus costs provided by Roadcruiser).

<sup>a</sup> Calculated on the basis of the regular air fare minus the Roadcruiser fare and 400 trans-island trips per year.

a decision that supported the inquiry recommendations (8).

As a first step, it was recommended that an advisory committee be formed that was made up of representatives from a number of groups, in particular disabled persons (who were potential users of the service), and personnel from CN Roadcruiser. Initially, this committee would investigate the potential for making improvements to the existing Roadcruiser bus, which would make it more accessible to many persons without the installation of a lift. This committee has been formed and is currently considering such modifications as the use of an extra mechanically operated step or a superimposed step to decrease the height of the steps; extra handrails that would be colored; removable armrests on some seats; and finally, for the deaf and visually impaired, flashing lights and mechanically operated rolling signs to clearly indicate and identify stops.

The report pointed out that a service that would appear to meet the terms of Section 3 of the National Transportation Act, which speaks generally of an "economic, efficient, and adequate transportation system making the best use of all available modes of transportation," was the combined use of the air and taxi modes. This service would be available to those persons who are unable, because of their disability, to use the Roadcruiser with manual lifting. Nevertheless, a major drawback to this option was that it did not seek out or develop the market or provide maximum mobility to disabled persons. It was estimated that the maximum cost for this type of operation would be less than \$179,000 annually.

Therefore, an alternative recommendation was made that was endorsed by the MVTC. The recommendation was that there be a 3-year experiment to establish and develop the market with respect to disabled travelers through the use of an Orion bus and three smaller lift-equipped vehicles; for cross-island trips, the air mode would be used. Although this recommendation has approval in principle from the federal government, financial assistance is required from the government, and funds have not yet been

provided. The capital cost for the experiment was estimated at \$277,500, with an annual operating cost of \$232,900. A breakdown of the cost estimates is given in Table 1.

#### OBSERVATIONS

The inquiry attempted to evaluate the option of fixed-route accessibility along with other options in the light of not only the civil rights aspect but also taking into account applicable Canadian legislation and transportation policy as well as the experiences of other countries. In this perspective, fixed-route accessibility was not seen as the most appropriate solution to the situation faced by the population in Newfoundland. Nevertheless, the concept was not discounted as a viable option in other contexts. In other parts of Canada or in other countries, depending on the population distribution, transportation service characteristics, and geographical features of the topography, fixed-route accessibility or some combination or permutation involving fixed-route accessibility may prove to be the more appropriate solution.

The recommendation in the inquiry report about the appointment of an advisory committee to monitor the implementation of the recommendations in the report (i.e., the improvements to the current Roadcruiser service and the experimental service) is seen as a particularly significant aspect of the report on the inquiry and crucial to the success of any service that would be adopted. The adoption of this recommendation and the spirit of cooperation and goodwill present in the meetings that have occurred to date can be considered as a positive step toward the advancement of better transportation service for disabled travelers.

Finally, the inquiry and the report, and its adoption by the MVTC, indicate that the CTC, while acting properly within its functions as a judicial and regulatory body, can play a significant role in the development of policy concerning transportation service for the handicapped.

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# Canadian Overview of Technological and Systems Research and Development on Transportation for Disabled Persons

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A general view of existing and planned innovations in technology and systems in Canada relating to the transportation of citizens with motor, hearing, sight, speech, or cognitive impairment is presented. Treatment of urban transportation highlights various advances in technology relevant to parallel modes. For example, the award-winning design of a wheelchair-securement/passenger-restraint system is described. Developments related to interurban systems are shown to be comprehensive because they cover problems experienced by special-needs travelers within air, rail, and surface modes, both at terminals and in transit. Canada's less-extensive applications in rural settings are also discussed.

Among the many recommendations made in 1981 by a Special Parliamentary Committee on the Disabled (1), those related to transportation were seen as key factors in guaranteeing the 1 million disabled citizens in Canada the right to independence and life satisfaction. Nevertheless, few people comprehend the enormous difficulties involved in conceptualizing, designing, developing, testing, and implementing the technological and systems innovations required to accomplish the objectives for transportation-disadvantaged persons. Numerous relevant projects had been undertaken before 1981, with the Transportation Development Centre (TDC) of Transport Canada spearheading the effort. Still, the Special Committee's announcements have alerted various government bodies and others concerned with transportation research and development to the need for greater activity in areas that affect the disabled. Hence funds for these purposes have been freed up to some extent, and the move toward new and creative technological and systems approaches to problems of transportation-disadvantaged persons has gained in momentum and coordination.

An overview of the state of the art of transportation for disabled persons in Canada is presented in this paper along with the technological and systems innovations that have already been accomplished and those planned or now in progress. An overall schema of urban, interurban, and rural transportation systems is adopted, and then the various types of subsystems and relevant technological developments are discussed within these three major contexts.

## URBAN SYSTEMS

### Public Transit

Only one Canadian city, Victoria in British Columbia, has attempted the adaptation of public transit for use by wheelchair occupants. In spring 1979

British Columbia Transit, working with the Capital Regional District, installed wheelchair lifts in four transit buses operating on a fixed route that served an area populated by elderly people (2). Manufactured by Transi-Lift Equipment in Calgary, the lift included several features that provided safety against operator error. Nevertheless, field evaluations, conducted during an 18-month period, were disappointing: equipment breakdowns were frequent after start-up but more importantly initial heavy use of the system eventually declined to zero because of the difficulty wheelchair users experienced in reaching bus stops. As a result, Victoria removed the lifts from the buses and shifted its effort to paratransit modes. This negative experience was scarcely an encouragement to other Canadian cities that were considering integrative transport for the disabled.

Modifications that would render public transport accessible to cognitively impaired persons, ambulatory elderly, and certain other special-need groups are somewhat less formidable than are those necessary to accommodate wheelchair passengers. For example, in the case of cognitive- or speech-impaired individuals, the barrier is largely one of communication and thus can be overcome with technical aid. Cooperating with the National Research Council, TDC is addressing part of the problem in a project that deals with the design and evaluation of remedial technology for cognitively impaired persons.

Apropos of the elderly, it is well known that declining strength impedes efforts of these citizens to mount the high first step on public transit vehicles, to get in and out of seats, to stand when no seat is available, or to ambulate when the vehicle is in motion. A recent report (3) indicates that the Toronto Transit Commission has been active in installing entrance grab bars and extra stanchions on certain seats in their vehicles, and communication with transit commission representatives in Montreal, Calgary, Edmonton, and Vancouver confirms that these major Canadian cities have followed suit. Nevertheless, lowering the first step to a point of easy access by the elderly is associated with engineering difficulties, not only because the suspension is not readily accommodated under the floor of the vehicle, but also because heavy snowfalls so common in Canadian winters interfere with clearance.

Flyer Industries has informed TDC that Toronto has obtained 10 air-conditioned buses with the