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Transportation

Planning for the Phase-In of Fixed-Route Accessible Buses

February 1982



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Planning for the Phase-In of Fixed-Route Accessible Buses

Final Report
February 1982

Prepared by
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Prepared for
Office of Planning Assistance
Urban Mass Transportation Administration
Washington, D.C. 20590

in cooperation with

Technology Sharing Program
Office of the Secretary of Transportation
Washington, D.C. 20590

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FOREWORD

Many transit systems are planning to introduce accessible buses into their fixed-route operation. To aid them, UMTA's Office of Planning Assistance initiated a study entitled "Planning for the Phase-In of Fixed-Route Accessible Buses." This report was prepared for use by transit systems and Metropolitan Planning Organizations in planning for these services so as to minimize service disruption and to maximize mobility benefits.

This document is the final report from the study. It provides guidance in seven key functional areas of the transit system that will be impacted by the phase-in of accessible buses. The seven areas are citizen participation; vehicle procurement and facility improvements; service planning and operations; maintenance; training; marketing; and monitoring and evaluation. The report offers a range of options which can be tailored to the particular system. We believe this guidance will be of value to operators and planners who are phasing accessible buses into their own transit systems.

Additional copies of this report are available from the National Technical Information Service (NTIS), Springfield, Virginia 22161. Please reference UMTA-IT-09-9010-82-1 on the request.



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ACKNOWLEDGMENTS

We wish to express our appreciation to all who have provided us with detailed information regarding the current status of their accessible bus operations and planning.

A special thanks is extended to Eileen Koc, Brian McCollom, and Irving Chambers in UMTA's Office of Planning Assistance, for their assistance in guiding the project, reviewing the draft reports, and making thoughtful suggestions for improving the report.

We would like to thank the members of the study review panel for their thoughtful comments on the study materials and contributions during panel meetings. The panel members were:

- Helena Barnes - American Public Transit Association, Washington, D.C.
- Natalio Diaz - Metropolitan Council of the Twin Cities Area, St. Paul, Minnesota
- Connie Garber - York County Community Action Corporation, Sanford, Maine
- Richard W. Hedding - Consumer, Washington Metropolitan Area Transit Authority, Washington, D.C.
- Linda King - Tacoma Transit System, Tacoma, Washington
- Thomas C. O'Brien - Massachusetts Bay Transportation Authority, Boston, Massachusetts
- William L. Volk - Champaign-Urbana Mass Transit District, Urbana, Illinois
- David Warren - T.H.E. Van, Salt Lake City, Utah

Finally, the cooperation and valuable input of the staffs at the two test site systems deserves recognition. We wish to thank Ed Colby, Sharon Dent, and Kathryn Heffernan at the Phoenix Public Transit Administration and Cliff Franklin, Jim Wiesehuegel, Gary Hufstedler, and John Haentfling of the Dallas Transit System. We also wish to acknowledge the assistance of numerous other individuals at both systems who participated in the planning for accessible service and provided us with their reactions to the contents of this report.

EXECUTIVE SUMMARY

Many transit systems across the country are planning to introduce fixed-route bus service which is accessible to handicapped persons. A number of transit systems have already started this service and are in the process of reviewing and expanding it. This report has been developed to assist the planning efforts of both categories of transit systems.

The report was prepared for use by transit systems and Metropolitan Planning Organizations (MPOs). It provides technical guidance in the functional areas that will be impacted by the introduction of accessible service. These areas include:

- Citizen participation;
- Vehicle procurement and facility improvements;
- Service planning and operations;
- Maintenance;
- Training;
- Marketing; and
- Monitoring and evaluation.

One chapter has been written on each of these areas. The chapters have been written so that they can stand independently. In this manner, various staff within the transit system and MPO are able to call on the report for quick-reference. The chapters are also cross-referenced in situations where one functional area is impacted by another functional area. Thus, for example, reference is made in the marketing chapter to the impact of service planning and operations.

The report is organized approximating the order in which the planning will occur. This flow of activities, the interrelationships among activities, and the approximate time frame for each activity is shown in Exhibit i. The time required for these activities will vary from one system to the next. The major determinant is the length of time required for vehicle procurement.

The objective of this report is to provide guidance which maximizes the benefits of fixed-route accessible service to handicapped persons with minimal disruption to existing service operations. The report guides transit systems and MPOs through their planning by offering a range of alternative approaches for each impact area.

EXHIBIT i PROGRESSION OF PHASING-IN ACTIVITIES

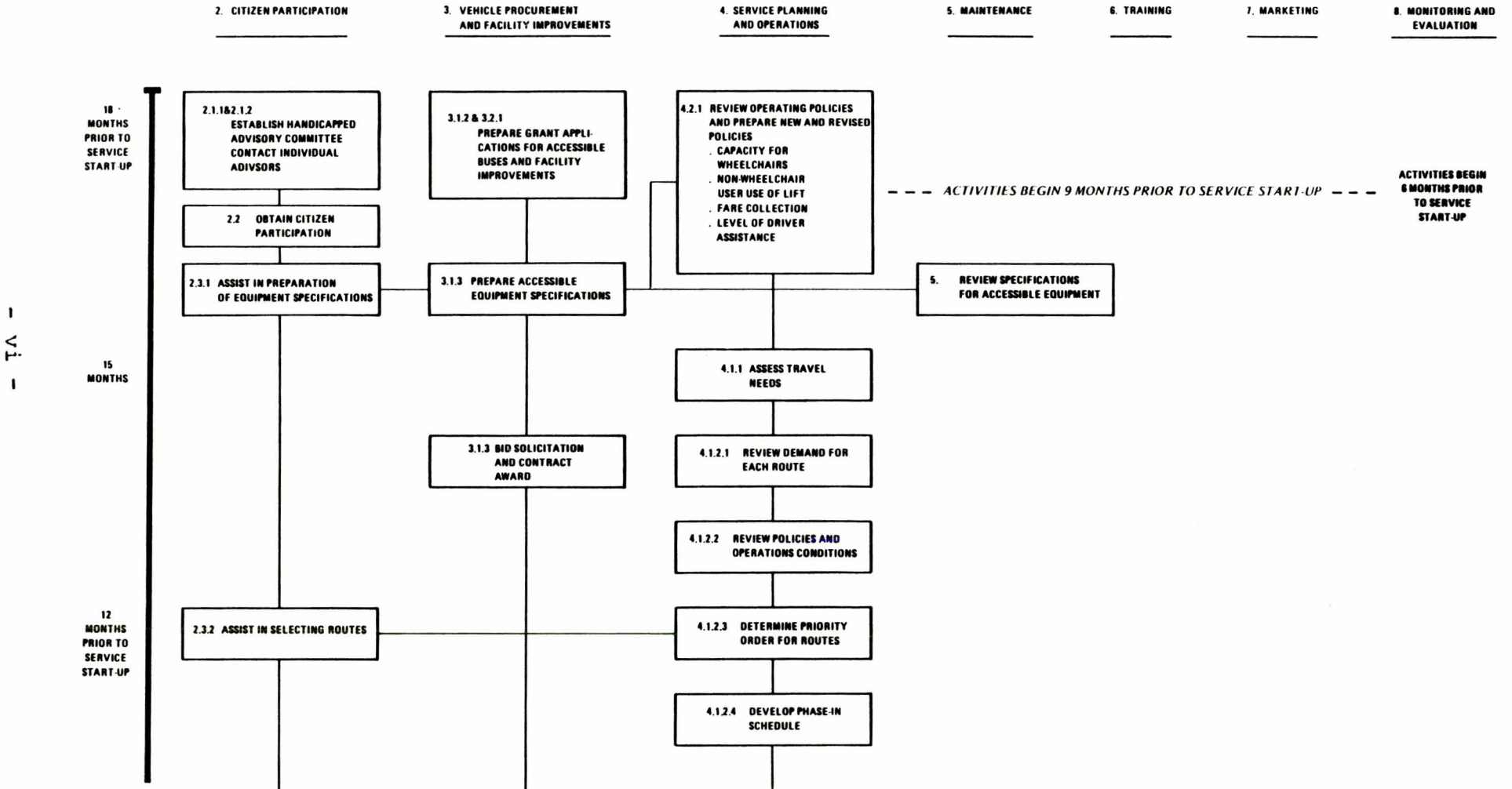
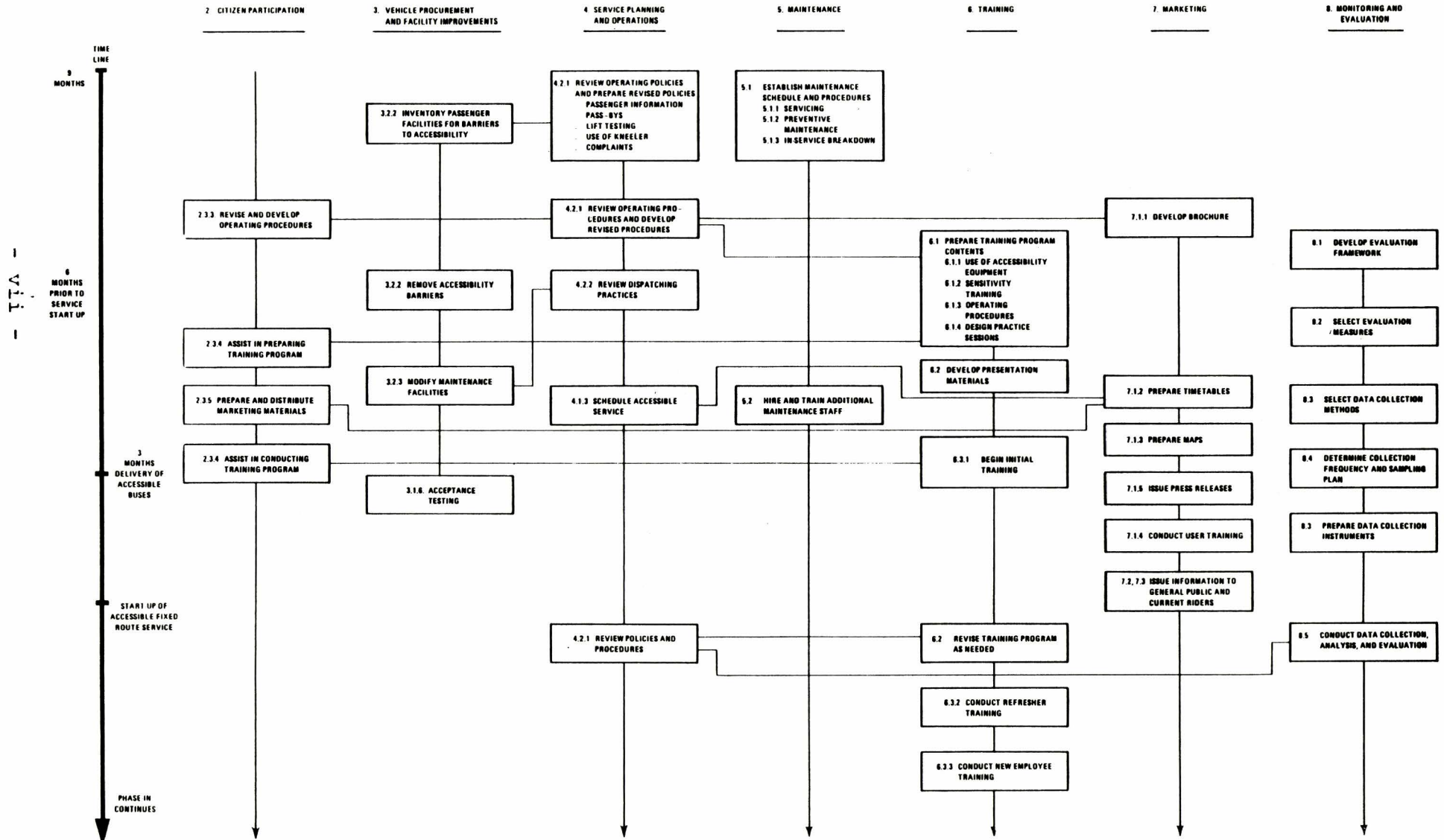


EXHIBIT I PROGRESSION OF PHASING-IN ACTIVITIES (CONTINUED)



The report does recommend some specific policies and practices which have been accepted by a number of transit systems and have been proven successful. These recommendations address operating problems that are faced by most transit systems now planning to introduce fixed-route accessible service. A brief summary of the options and recommendations is provided below for each impact area.

Citizen Participation

Citizen participation in the planning process is necessary to insure that accessible service is responsive to the needs of transportation handicapped persons. A number of techniques are recommended:

- Citizens Advisory Committee - A formal handicapped citizens advisory committee should be formed or reactivated. This committee should be used throughout the planning process both before and after service initiation.
- Local Experts - Individuals with specific technical expertise should be asked to serve as technical advisors to the transit system, the MPO, and the citizens advisory committee. Their guidance may not be continuous but rather should coincide with their areas of expertise.

The disabled citizen's role in planning service is multi-fold. Their involvement is recommended to enhance numerous areas including: preparing technical specifications; selecting routes; revising or developing operating procedures; developing and conducting training programs; and preparing and distributing marketing materials.

Vehicle Procurement and Facility Improvements

The procurement of accessible buses is generally one of the first steps leading to the removal of a transit system's physical barriers. Accessible buses are equipped with features such as the wheelchair lifts, wheelchair securement devices, kneeling mechanism and other rider aides. Transit systems can acquire accessible buses by either purchasing new buses or retrofitting their fleet. The majority of bids for new fixed-route vehicles will be for the Advanced Design Bus (ADB); it can be ordered with a lift and other accessible features as standard equipment. Other standard-size buses, high capacity articulated buses, and small/medium size buses can also be ordered with specifications for accessibility.

Although the basic steps of the procurement process are not significantly impacted by adding accessibility features, particular elements of the process require special consideration. The costs of lifts and other accessibility-related provisions must be included in the estimate of the purchase costs. In addition, the applicant's program narrative should describe the accessible features to be purchased and the benefits which will be derived from them.

The preparation of technical specifications requires special considerations, also. Depending on the type of equipment or buses to be purchased, the transit system is generally responsible for preparing specifications which detail the configuration and performance requirements for the proposed purchase. The transit system should be cognizant of the impact that design and performance specifications will have on developing operating policies and procedures. One of the most important specifications to be written is for wheelchair securement. The following are recommended for these specifications.

- Two securement areas should be provided on each bus;
- A padded bar or wheelclamp should be supplemented with a seatbelt to secure the wheelchair frame; and
- Forward facing securement devices located close to the lift will provide the safest ride.

Acceptance testing is the final area which requires consideration. The accessibility equipment should be subjected to the same rigorous level of testing as all other components. To demonstrate the contractor's compliance with the technical specifications, each lift and kneeler on every bus should be cycled to verify that the apparatus is operating correctly and smoothly. Visual inspections should also be conducted to verify that the components and subsystems appear and function as designed.

In addition to procuring new buses, preparing for accessible service may also entail modifications to the system's fixed facilities. These include facilities used by passengers such as bus stops, bus shelters, terminals, park-n-ride lots and information centers as well as facilities used by system personnel to maintain and store the buses. Prior to service initiation, passenger facilities along proposed accessible routes should be modified to be made accessible. Modifications to maintenance and storage facilities may also be required to facilitate lift maintenance and to segregate accessible buses from non-accessible ones in the vehicle storage areas.

Service Planning and Operation

There are a number of issues which must be addressed in service planning and operation. Determining the order in which routes are phased into accessible service is a critical issue. If the travel needs of handicapped persons can be met during the initial phase, the transit system can build a strong foundation for future accessible service. Service planning will be guided by a number of operating policy decisions. These decisions should be made early in the process to enable the system and its handicapped advisory committee to assign priorities to the routes and develop a schedule for each route's phase-in.

Scheduling accessible service is a major activity for transit systems. Before developing schedules for accessible service, several issues should be resolved. A major issue is running time. The introduction of accessible equipment could impact the amount of time required for passenger boarding and alighting which in turn could impact layover time requirements. As ridership and mechanical difficulties may occur on a sporadic basis, extra time should not be added to all routes during initial scheduling if there is adequate layover time. Instead, a "wait and see" policy is recommended wherein additional time is only added to the schedule for specific trips on specific routes where extra time is repeatedly required for regular passengers. Where feasible it is recommended that accessible service be operated at base period frequencies -- that is, operating only accessible buses in the base period and the same number of accessible buses during other times. To do this, accessible buses should be assigned to straight runs.

The implementation of accessible bus service impacts a wide range of operating policies. These operating policy areas include:

- . Driver assistance to passengers,
- . Order of boarding,
- . Restrictions on lift use,
- . Use of the kneeling feature,
- . Fare collection,
- . Aides and companions,
- . Priority seating,
- . Safety and emergency procedures,
- . Passenger pass-bys,
- . Lift testing, and
- . Passenger complaints.

There are a range of alternatives for each policy. The selection of appropriate ones should be based on individual system characteristics, technology, labor conditions, and existing policies and practices.

In addition to operating policies, a number of issues must also be considered in dispatching accessible buses. These include storing accessible buses, assigning buses to accessible runs, responding to vehicle shortages and determining the spare ratio. The transit system should also review and revise the responsibilities of street supervisors, since their role may be expanded with the implementation of accessible service.

Maintenance

Proper maintenance of accessible buses is a major determinant of their successful phase-in and continuous operation. The introduction of wheelchair lifts, kneeling features, securement devices, and other accessibility components into a bus fleet requires the development of new maintenance policies and procedures. To the maximum extent possible, maintenance of this equipment should be integrated into current servicing, scheduled maintenance and unscheduled maintenance activities. The manufacturer's recommendations regarding lift inspection and maintenance should be followed.

A policy for frequent testing of the lift should be implemented. It is recommended that lifts and kneelers be tested at least daily as an assurance of proper operation during revenue service. In addition, lift inspection and maintenance should be incorporated, if possible, into the existing inspection schedules. Lift manufacturers typically recommend a two-stage inspection program: a frequent minor inspection every week or 1,000 to 1,500 miles of service and a less frequent major inspection every month or 3,000 miles of service.

Maintenance and repair requires trained mechanics, parts, and space within the maintenance facility. At most transit systems, additional personnel may be required for accessible bus maintenance. The size of the increase depends on the number and types of lifts to be maintained, the operating climate and management policies.

Training

The implementation of fixed-route accessible service introduces new technology and changes procedures and policies. An effective training program is vital to ensure that all affected personnel become familiar with these changes and that they understand and become sensitive to the needs of handicapped passengers.

The training programs should be tailored for approximately five different categories of transit system personnel:

- . Drivers,
- . Street supervisors,
- . Mechanics,
- . Telephone information operators, and
- . Community relations staff.

The specifics of the training program may vary depending on policy decisions, bus and lift models, and local conditions. Four elements which should be common to all training programs are:

- . Use of the accessibility equipment,
- . Sensitivity,
- . Operating procedures, and
- . Practice sessions.

The last element is strongly recommended to guarantee "hands on" experience with the new equipment. Transit systems also should make provisions for on-going practice opportunities and establish refresher training sessions. The curriculum for new employee training should be revised to incorporate accessible service features, also.

Prior to service initiation, some of the drivers must be trained. At a minimum it is recommended that all drivers assigned to accessible runs as well as the extra board drivers be trained. While not all drivers should be trained initially, all other system personnel, such as street supervisors, mechanics, telephone information operators, and public relations staff, should be trained before service begins.

In addition to guidance on training program contents and schedules, this report provides a directory of selected training programs already developed by transit, federal, and social service agencies. In addition, it provides addresses for a number of disabled consumer groups who provide information that can be used in a training program.

Marketing

Information dissemination is especially important in marketing accessible services to disabled riders. These passengers have information needs similar to any new passenger. They should be given directions for reading timetables, transferring, paying their fares, and calling for information. In addition to these needs, however, prospective handicapped passengers must also have information on use of the accessibility features (such as lifts and securement devices).

Brochures containing a series of photographs of various stages of the lift cycle are useful in illustrating how the lift and securement device operate. Brochures announcing and explaining the new accessible service should be distributed at information centers, at terminals, on buses, and by mail. It is also essential that public timetables be modified to indicate which trips operate with accessible buses. This can be done by either indicating accessible trips in bold type, or by using a symbol or placing a letter next to the scheduled trip. A map of the first routes to be made accessible should be prepared and either inserted in the brochure or appended to the timetables.

The transit system should also make information available to current riders and the general public. Marketing staff should make presentations to potential users and the general public to orient them to the new equipment.

Monitoring and Evaluation

A transit system's monitoring and evaluation program should be modified to assess the impacts of accessible service on transit system performance. The monitoring and evaluation program should signal operational areas which require immediate attention and provide adequate information for fine-tuning or modifying existing service. The program should also document current experience to support the planning and implementation of additional accessible service.

Transit systems should select evaluation measures which provide information to support decisions concerning scheduling changes, vehicle assignments, spare vehicle ratio, personnel requirements, training needs, and inventory levels. Examples of measures which could be used in evaluating operating and maintenance performance are as follows:

Operations Evaluation

- . Ratio of on-time trips to total trips
- . Number of times the lifts are used
- . Number of and reasons for pass-bys
- . Passenger feedback
- . Number and types of accidents

Maintenance Evaluation

- . Ratio of missed trips to total trips
- . Number of service miles between accessibility component related road calls
- . Number and types of equipment malfunctions and repairs
- . Labor and materials consumed

Wherever feasible, data for developing these measures should be collected using the transit system's established data collection procedures. If additional data are warranted, their collection should be coordinated and integrated to the extent feasible with ongoing data collection activities such as trip sheets; road call reports; bus inspection and maintenance records; and repair time and parts reports. One additional form, a new lift repair record to be completed by the maintenance department, is suggested to provide a summary of all lift repair work. Ongoing data collection methods are suggested for collecting lift use and pass-by data and for all maintenance data. Periodic data collection methods can also be used. Two such methods are ride checks and point checks. Both rely on special data collection teams or street supervisors rather than drivers and maintenance personnel. These methods are useful in acquiring schedule adherence data.

Several data collection frequency and sampling options should be considered. Whenever feasible, data elements collected by ongoing methods should be continuously sampled. Periodic data collection efforts which require the use of a survey team are conducted less frequently. A procedure for selecting the appropriate sample size is discussed briefly in the report.

To be of use to decision-makers, the findings of the monitoring effort should be presented in a concise format which clearly conveys the desired information. Therefore, once the performance measures, data collection methodology and reporting frequencies are established, a final step in planning a monitoring and evaluation program should be the development of a summary report format. An example is presented in the report.

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CHAPTER 1 INTRODUCTION

The objective of this report is to provide transit systems and Metropolitan Planning Organizations (MPOs) with guidance for planning and implementing accessible fixed-route bus service. This report provides guidance in the areas which are impacted by the phase-in of accessible buses. The areas are citizen participation; vehicle procurement and facility improvements; service planning and operations; maintenance; training; marketing; and monitoring and evaluation.

It is not the intent of this report to present one correct means of phasing-in accessible service. Rather, a range of options are offered which can be tailored to the unique characteristics of the local transit system and its service area. These options have been developed with the desire to maximize the accessibility of fixed-route transit service to handicapped persons, while at the same time minimizing the disruption of existing service operations.

1.1 Study Approach

This document is a product of a research program sponsored by the Urban Mass Transportation Administration of the U.S. Department of Transportation. The emphasis of the study was to develop practical guidance which will be useful in the transit system's and MPO's day-to-day planning and implementation activities. To accomplish its research objectives, the conduct of this study was organized into four phases, which are described as follows:

- Phase I: A review of current experience in the planning and operation of fixed-route accessible services and the identification of all areas impacted by such phase-in activities.
- Phase II: The preparation of technical advice in the areas identified in Phase I. General categories include citizen participation; vehicle procurement and facility improvements; service planning and operations; maintenance, training; marketing; and monitoring and evaluation.

- Phase III: The preparation of a draft guidance report consisting of the findings and technical advice prepared on the basis of the previous two phases.
- Phase IV: Testing of the draft document in Phoenix and Dallas where accessible fixed-route buses are programmed.

In Phase I a review of current experiences in planning and operating fixed-route accessible services was conducted. Interim Report No. 1, entitled Review of Accessible Transit Services, documented the current status of planning practices related to the phase-in of this service.(1) A wide range of policies and procedures were identified and assessed in light of the operating environment found at six case study sites. The case studies provided the opportunity to evaluate new practices and to identify strengths and weaknesses during the early stages of the phase-in process. The case study analysis also assisted in identifying the major functional areas impacted by accessible service.

In Phase II technical guidance was prepared for each impact area. This material provided the basis for the development of a draft report. The draft report was then tested in Phoenix and Dallas -- systems preparing to initiate fixed-route accessible service. Their experience in applying the procedures and recommendations contained in the draft report are reflected in this revised version -- the final report.

To guide the overall study effort, a Review Panel consisting of nine experts was assembled. The panel met throughout the study and provided comments on study products.

1.2 How to Use this Document

Technical guidance is provided for each of the seven major functional areas which are impacted by the introduction of fixed-route accessible buses. Each area is discussed in a separate chapter. The points which are discussed in each are listed below.

Chapter 2: Citizen Participation

- How to establish or reactivate a citizens advisory committee;

- . What assistance local experts can provide when planning accessible service; and
- . What role citizens can play in planning and evaluating accessible service.

Chapter 3: Vehicle Procurement and Facility Improvements

- . What impacts accessibility components may have on the vehicle and equipment procurement process;
- . What the design and performance characteristics of accessibility-related equipment and features are;
- . How these characteristics will affect service planning and operating policies;
- . What the potential obstacles to accessibility at passenger facilities are and what the remedies are; and
- . What modifications may be required to the bus maintenance and storage facilities.

Chapter 4: Service Planning and Operation

- . How to assess the travel needs of the transportation handicapped community;
- . How to determine routes, headways and coverage areas;
- . How policy decisions concerning depot selection, geographic coverage and service frequency affect the priorities for route selection for accessible service;
- . What factors need to be considered before schedules can be finalized;
- . How operating policies and procedures are impacted and what revisions should be considered;
- . What issues need to be considered for developing dispatching procedures for accessible service; and
- . How the duties of street supervisors are affected.

Chapter 5: Maintenance

- . How to schedule lift testing and servicing;
- . How to integrate lift and other accessibility--related components into the current maintenance program; and
- . What the additional staffing requirements may be.

Chapter 6: Training

- . What topic areas should be addressed by the training program;
- . What methods should be used to present the training materials; and
- . When training should be scheduled.

Chapter 7: Marketing

- . How brochures, timetables, media and presentations can be used to disseminate information to the handicapped community; and
- . How information can be provided for current riders and the general public.

Chapter 8: Monitoring and Evaluation

- . How to establish objectives for evaluating service phase-in;
- . What data elements should be included in a monitoring and evaluation plan; and
- . How frequently and with what sampling rate these data should be collected.

It is suggested that the report be first read in its entirety. This will put the information in context and will convey the broad scope of policy areas and activities which are affected by the planning and operation of accessible service. It will also indicate the interrelationships among the impact areas and the need to coordinate decision making. Throughout the report, cross references are made to the implications one functional area may have on others.

The report can also be used as a reference source for particular impact areas. Guidance for each impact area is presented in a separate chapter. To further facilitate the document's use as a reference source, planning activities are presented in chronological order that approximates the sequence of planning steps that the transit system and MPO will undertake.

In many impact areas, specific techniques or policies are recommended as preferable to others. These recommendations were often made as a result of successful tests of these techniques by transit systems currently planning or operating accessible service. In other cases the recommendations simply reflect sound planning practices. However, in several impact areas a range of potentially sound planning options is discussed without specifically identifying one suggested approach. In these areas the most appropriate policy and practice should be chosen based on the local operating environment and current operating policies.

1.3 Flow of Planning Activities

The planning activities for the implementation of fixed-route accessible service follow a logical flow of analysis and decision making. The planning activities associated with impact areas discussed in this manual are presented in the chronological sequence shown in Exhibit 1-1. For each impact area the interrelationships among different aspects of the phase-in process and the estimates of the lead time requirements for these activities prior to the start-up of accessible service are also shown. The time frame indicated is an approximation. The actual schedule for each step is dependent on circumstances such as local conditions, capital grant application processing requirements, and the bus manufacturer's delivery schedule. Each activity in the diagram is identified by the chapter and section number which corresponds to the report's organization.

EXHIBIT 1-1 PROGRESSION OF PHASING-IN ACTIVITIES

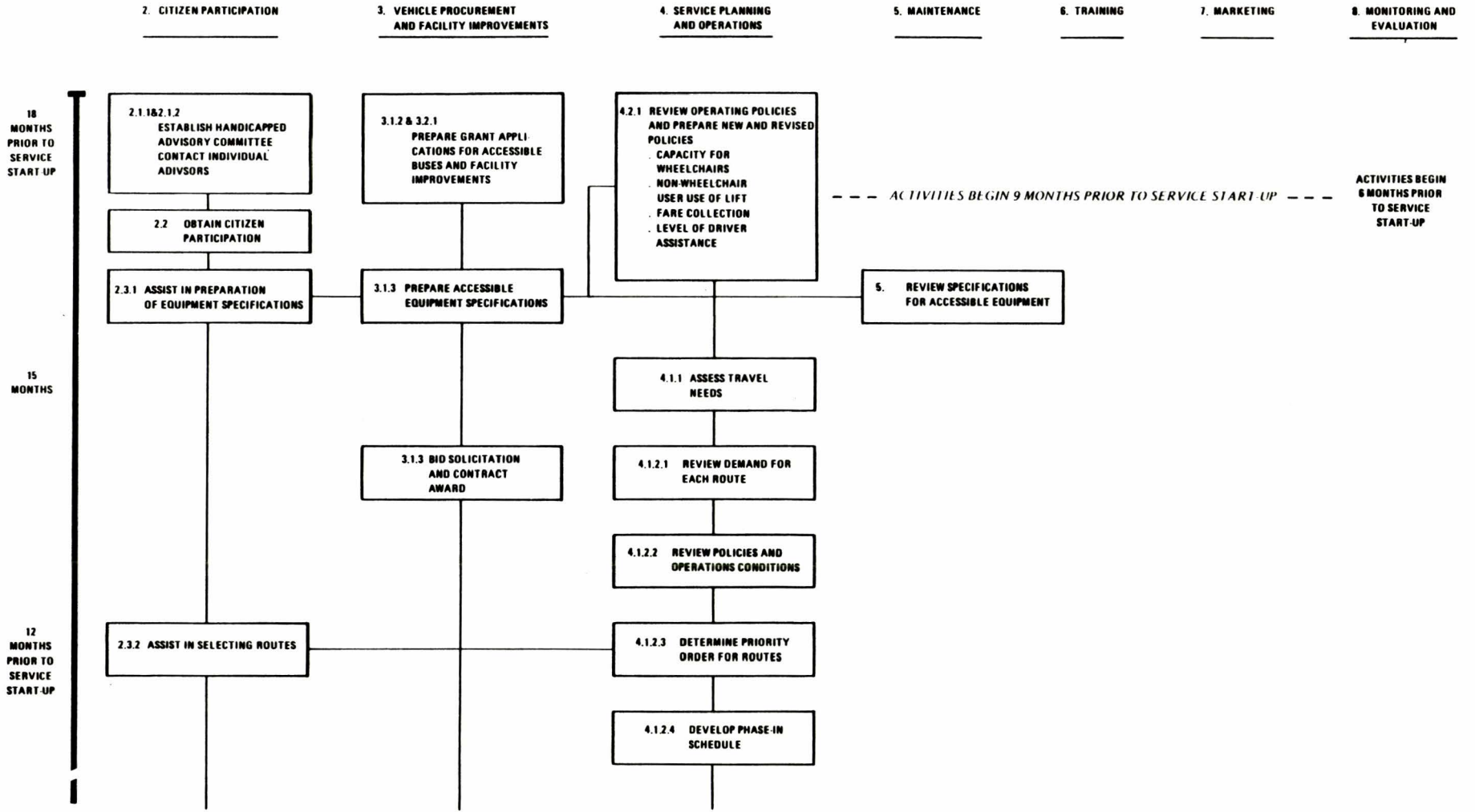
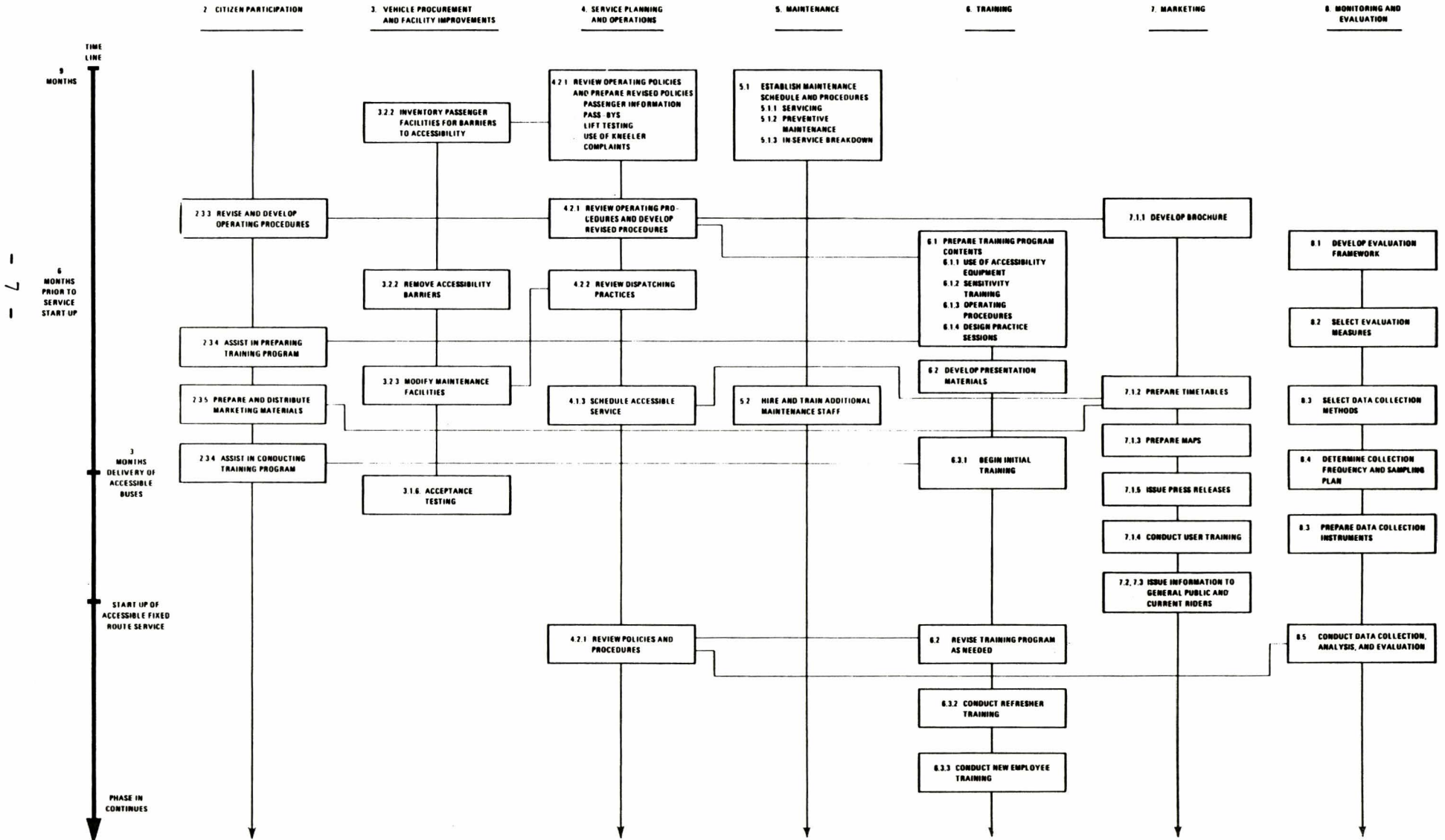


EXHIBIT 1-1 PROGRESSION OF PHASING-IN ACTIVITIES (CONTINUED)



FOOTNOTES: CHAPTER 1

- (1) Booz, Allen & Hamilton Inc. and Synergy Consulting Services, Planning for the Phase-In of Fixed-Route Accessible Buses, Interim Report No. 1: Review of Accessible Transit Services, (Washington, D.C., Urban Mass Transportation Administration), January, 1980.

CHAPTER 2 CITIZEN PARTICIPATION

Establishing a close working relationship between local citizens and planning agencies is necessary to ensure that plans and programs are responsive to the needs of the community. Citizen participation is particularly valuable in planning for accessible buses since the first-hand knowledge of citizens can be a helpful addition.

An umbrella-type citizens advisory group exists in most urbanized areas for planning. Also, some transit systems have established consumer panels to advise the board and general manager. Under the auspices of these groups, more specialized subcommittees are often formed to advise on a particular study or topic area. The advent of accessible service can be a catalyst toward the formation of such a committee to participate in the planning of fixed-route bus service for transportation handicapped persons. This committee should be comprised of independent members of the handicapped community, representatives from agencies and groups that deal with disabled persons, and transportation service providers.

This chapter details the procedures for establishing and working with an advisory committee. Other approaches for obtaining citizen input are also described. Steps in the planning process where the guidance of a committee and individuals could be sought are also listed along with the type of input that it might be possible to obtain.

2.1 Establish Citizen Participation

In most areas it is possible to work within the existing avenues of citizen participation. Existing committees of agencies and consumers formed for earlier planning efforts should be used for guidance in preparing for accessible service initiation. Advisory committees provide an ongoing group of interested citizens which can be continuously tapped as a resource. Whenever possible, it is recommended that an existing committee be used rather than establishing another committee.

In addition to establishing a formal advisory committee, the transit system and MPO should initiate contact with knowledgeable individuals. This might be staff at a local

rehabilitation or independent living center or professors at a nearby university. These individuals may not be able to serve on a committee because of time constraints. Nonetheless, they may be available for consultation on key technical issues.

These two procedures - - formal standing committees and individual advisors - - are discussed in more detail below. Both are recommended as effective methods for obtaining citizen input.

2.1.1 Formal Standing Committee - To help ensure significant participation by handicapped consumers, many transit systems and MPOs have created a formal citizens advisory committee with members drawn from disabled consumer organizations, advocacy groups, social service agencies, and transportation provider agencies. In this way, those individuals with a vested interest in accessible service and those with knowledge of existing services and problems are brought together. The involvement of both consumers and providers on one committee provides a rare but essential forum for them to work together.

2.1.1.1 Membership - In establishing a committee or reviewing the membership of an existing group, the system should attempt to include as many diverse interests as possible. At a minimum, this includes:

- . Handicapped persons,
- . Advocacy organizations of handicapped persons,
- . Public and private social service agencies,
- . Public and private operators of specialized transportation services, and
- . Public and private transit operators.

Committee members should represent a variety of disabilities (such as those who use wheelchairs and those who use walking aids) and be balanced in terms of geographic distribution. Local staff usually have had contact with agencies and transportation providers through previous planning activities. Most often, advocacy groups are missing from the membership roster. Some local advocacy groups can be located through their national and state parent organizations. Additionally, the committee should include unaffiliated handicapped persons who are not agency staff or organizational representatives.

2.1.1.2 Permanence - A formal standing committee, rather than an ad hoc group, is recommended. One advantage of the formal committee is that its members will have the time to become familiar with the planning process, the transit system's operating practices, and the technology

it is employing. The staff will not have to spend the time orienting a new committee if the individuals have been involved in earlier projects.

2.1.1.3 Sponsorship - When both the MPO and transit system have existing committees and one must be chosen over the other, it is recommended that the transit system's committee be used since it will have been involved in operational issues. This recommendation assumes that the MPO's committee deals primarily with regional policy issues. The focus of the accessible service committee should be more on day-to-day transit operations. Hence, the transit system committee is the more appropriate. Where only an MPO committee exists, the sponsorship should remain the same though the transit system staff should become active participants and, where feasible, co-sponsors.

2.1.2 Individual Advisors - If the region has a university which offers courses in therapy or rehabilitation, the professor who teaches them should be contacted. Individuals who conduct training for paratransit programs are another resource. Also, if there is a rehabilitation center or other types of transitional programs, such as independent living centers, the transit system should notify them of their intent to provide accessible service and ask for their help. Other professionals with expertise in dealing with handicapped persons should also be identified. Members of the advisory committee can guide the transit system in locating the experts.

These individual advisors should work within the committee framework. However, it is recognized that some professionals may not be able to commit themselves to regular involvement on a committee. Therefore, they can be asked to be technical advisors to the staff and committee.

The advice of technical advisors may not be needed or relevant to all steps in the planning process. However, some areas, such as preparing and conducting training programs, are significantly enhanced by professional advice.

2.2 Obtain Citizen Participation

Once the committee has been organized, the staff should schedule meetings and distribute material. This section suggests actions that can enhance the ability of the committee to participate effectively. Because of the special nature of accessibility problems and the mobility limitations of transportation handicapped persons, the system may have to develop

additional mechanisms for contacting committee members, providing them with information, and scheduling meetings. These same procedures should be followed when public meetings are held on phasing-in accessible service.

2.2.1 Communicating with the Committee - The current procedures used by the transit system and MPO to contact the community may not be adequate. If a general mailing goes out to committee members asking for their comments, the following extra actions may be necessary:

- . Members of the committee who are sight-impaired should be contacted and informed of the material. A summary of materials could be placed on tape or in large type for sight-impaired individuals.
- . Provisions for TTY service (one type of telecommunications device for the deaf, also called a TDD) may be necessary if there are hearing-impaired persons to be contacted by phone.

These procedures offer the maximum opportunity for committee members to be fully informed and be active participants in the planning process.

2.2.2 Transportation to Meetings - Adequate transportation to committee meetings may present a problem for some members. Where possible, meetings should be held within the service area of accessible service providers. Parking spaces should be reserved near the entrance for disabled persons who drive.

2.2.3 Scheduling and Conducting Meetings - All meetings should be held in locations which are accessible in terms of barrier-free design and transportation availability. Meetings should be held at a time that is convenient to the members. Initially, the staff should poll them to determine days and times that are acceptable. If there are conflicts, a schedule could be developed which rotates meeting times. Night meetings should be considered for committee members who cannot leave their jobs to attend day meetings. For any hearing-impaired persons, a sign language interpreter should be obtained. Sources for locating an interpreter include local non-profit or state-funded organizations for deaf persons. Meeting notices should include statements regarding building access, transportation availability, and sign language interpreter availability.

Only essential meetings should be held. In some cases, conference calls or telephone polling can minimize the need for meetings.

2.3 Areas for Citizen Input

The insights and opinions of disabled persons and knowledgeable professionals are beneficial to those planning accessible fixed-route service. An advisory committee and individual advisors can provide valuable resource information throughout the planning process, particularly at the following steps:

- . Preparing technical specifications,
- . Assessing facility accessibility,
- . Selecting routes,
- . Revising or developing operating procedures,
- . Developing and conducting training programs, and
- . Preparing and distributing marketing materials.

The type of information that should be sought in each of these steps is discussed in separate subsections.

While seeking citizen input, it is important that staff and citizens be reminded of their advisory roles. Information provided to the staff should be considered as suggestions. The staff, and ultimately the system's policy board, should use this information as they deem appropriate to shape their final decisions.

2.3.1 Preparing Technical Specifications - Within the transit system's staff are individuals who have technical expertise to develop specifications. Often, their expertise is focused on the performance capabilities of equipment and on the architectural design of facilities. Committee members can provide these experts with specific information on its usability. For vehicle procurement or retrofit, they can be particularly helpful in determining lift features (slope, handrails, and clearance); the location and number of securement devices; and additional components such as seat belts, bell cords, and stanchions. For fixed facilities, their input is beneficial for selecting ramp designs, type of doors to be installed, parking provisions at the system's buildings, as well as standards for installing bus shelters so that they are accessible.

2.3.2 Selecting Routes - A knowledge of origins and destinations for potential handicapped passengers is vital for effective service planning. Handicapped members of the committee who are in the mainstream of society are familiar with the generators that are frequented by themselves, as well as by other members of the handicapped community and can thus provide important travel needs information.

2.3.3 Revising or Developing Operating Procedures - The committee members and technical advisors can assist the transit system to revise its current operating procedures or to develop new ones. They can take part in trial runs prior to service initiation. Testing may point up certain problems which could be solved through a change in specifications or operating policies. The tests may include examining the following:

- . the safety of the lift for standees;
- . their preferences for forward-facing or backward-facing wheelchairs during boarding;
- . the adequacy of the securement device; and
- . their need for assistance in boarding.

If the committee members reflect a cross-section of the handicapped community, the tests can provide results for different types of disabilities.

Prior to service initiation, the committee members can also assist in identifying boarding barriers along a particular route. These would result, for example, from too high a roadway crown; obstructions from benches, newspaper racks or trees; or limited space for access. By taking a bus and a committee member on a test run, it is possible to determine which stops can be used for accessible service. This information can then be provided by the transit system to potential handicapped passengers.

A by-product of this effort is a list of priority locations for bus stop improvements. Committee members may be able to assure that these locations are given a high priority by the appropriate local agencies and the improvements are in fact made. Street testing also provides information on how to raise or lower a disabled passenger over a curb (if system policy permits this) when an obstacle makes it necessary to stop the bus away from the curb.

The transit system may also want to ask the committee to advise them on potential operating policies such as dealing with boarding and alighting from crowded buses, pass-bys, types of assistance, and fare collection. When asking for their advice, the transit system and the committee members should be reminded that their input is advisory and that the final policy will be developed by the staff and transit system board. This advice should be sought both before and after accessible service starts since some policies may be left undetermined until information on actual operating conditions can be collected.

The committee should review these conditions and suggest ways to revise procedures as necessary.

2.3.4 Developing and Conducting Training Programs - This is one area where the advice of committee members and local professionals is particularly beneficial. The training programs may include instructions for drivers in using the equipment and aiding disabled passengers; sensitivity to the needs of disabled passengers for drivers, telephone information operators, street supervisors, and other transit system personnel; and practice sessions to train future passengers in the use of the lift and securement device. In all of these areas, committee members and technical advisors can provide background information, assist the staff in the development of the training programs and review the program once it is developed.

Once the programs are developed, the committee members and technical advisors should be asked if they would assist in relevant portions. Most sensitivity programs rely on films and lectures to teach awareness. Actual one-on-one involvement with a disabled person can reinforce these principles. If a driver is required to work closely with a disabled person during the training program, the personal contact can serve to dispel many of the driver's misconceptions and apprehensions regarding handicapped persons.

Committee members can also assist in arranging and conducting demonstrations for users. The presence of handicapped persons at a user training session can reduce someone's fear of trying the lift through positive peer group pressure. Committee members and technical advisors are also instrumental in identifying sponsors for the demonstrations as well as in encouraging members of the disabled community to participate. If it is not possible for the committee members and advisors to attend the training sessions, their advice should be sought as to how to conduct them.

2.3.5 Preparing and Distributing Marketing Materials - The brochures and timetables for the accessible service should be prepared well in advance of service initiation. The handicapped advisory committee can assist by reviewing the materials to determine whether the information conveyed is understandable by and sensitive to the general handicapped population.

The committee can serve as a vehicle for the distribution of information and materials. Their assistance in disseminating information can occur in three major ways:

- . Providing the marketing department with a mailing list of individuals to whom literature could be sent;
- . Preparing articles or having the system's press release printed in newsletters that will reach the target market; and
- . Scheduling and sponsoring user training programs for the members of their organization to become familiar with transit equipment and services.

This illustrates the variety of resources that the committee members can offer the transit system and MPO.

* * * * *

This chapter discussed the framework and areas of participation by the handicapped community in planning for accessible fixed-route service. A committee representing diverse interests can provide insight and personal reactions throughout the planning process. Local professionals who are unable to serve on the committee should be asked to serve as technical advisors. Specifically, assistance from citizens is recommended for preparing technical specifications; selecting the order for phasing-in routes; revising operating procedures; developing and conducting training programs; and preparing and distributing marketing materials.

CHAPTER 3
VEHICLE PROCUREMENT AND FACILITY IMPROVEMENTS

Preparation for phasing-in accessible bus service involves purchasing accessible buses and undertaking fixed facility improvements. This chapter identifies equipment and facility related improvements which enhance the accessibility of fixed route bus service to transportation handicapped individuals. Specifically, impacts on the procurement process, characteristics of accessibility-related components, and potential modifications to facilities are the major topic areas discussed in this chapter.

3.1 Vehicle Procurement

The purchase of accessible buses is one of the first steps leading to the removal of a transit system's barriers. Accessible buses are equipped with features and devices making them accessible to transportation handicapped persons who use steps as well as to those who use wheelchairs. Accessibility equipment includes:

- Level change devices such as lifts or ramps,
- Wheelchair securement devices,
- Kneeling mechanism, and
- Other aides such as a public address system and passenger assists.

Transit systems can acquire accessible buses by either purchasing new buses or by retrofitting buses that are currently a part of their fleet.

3.1.1 Procurement Process - The majority of bids for new fixed-route vehicles are for the Advanced Design Bus (ADB), as the domestic manufacturers of full size transit buses (General Motors Truck and Coach Division, the Grumman/Flexible Corporation and Neoplan-USA) currently manufacture only this type of bus. A lift can be ordered as standard equipment on the ADB. In addition to ADBs, other standard transit buses - - either 35 or 40 foot designs - - are available from several manufacturers, including General Motors of Canada and Flyer Industries, also of Canada. Other bus options for fixed-route service include the

55 or 60 foot articulated bus and 25 or 30 foot buses. Standard size, articulated and small/medium buses can be ordered with specifications for accessibility-related equipment.

Although new bus purchases have and will continue to be the primary means of obtaining accessible buses, an alternate approach is to install wheelchair lifts and related accessible features in currently owned buses. Retrofitting buses may be undertaken either as an element of an overall bus rehabilitation program or as a separate vehicle improvement program. The issues relating to retrofitting will be discussed in more detail later in this chapter.

Regardless of the means by which accessible buses are acquired, several aspects of the procurement process for both new and retrofitted accessible buses require careful consideration. The procurement process for most capital purchases involving federal assistance consists of four basic steps. These are:

1. Preparation of Capital Grant Application,
2. Preparation of Equipment Specifications,
3. Solicitation of Bids and Awarding of Contract, and
4. Testing Buses for Acceptance.

3.1.1.1 ADB Procurement - The procurement procedures for the ADB have been codified by the publication of the standard procurement bid package.⁽¹⁾ This guideline document, commonly known as the 'White Book' was developed to streamline and standardize solicitation; offer and award documents; technical specifications; quality assurance provisions; and warranty provisions for ADB purchases. The objective of these procedural improvements is to shorten the processing period and accelerate the delivery of buses. Though UMTA has announced its intent to end the mandatory use of the White Book effective October 1, 1982,⁽²⁾ it nonetheless remains a valuable source for ADB specifications.

3.1.1.2 Other Procurements - For purchases of other buses, including standard size, articulated, and small/medium buses, the four step procurement process, with a few modifications related to accessibility components, is similarly followed. The most significant changes concern the preparation of technical specifications and the testing and acceptance of equipment. Specification packages should be reviewed for the inclusion of accessibility features, such as the location of passenger assists, the placement of exit signals, and the visibility of signs. Because lifts, securement devices, public address systems, and kneeling

features may not be standard equipment on these buses, additional specifications for these features should be prepared for inclusion in the bid package. Similarly, acceptance testing procedures for these items should also be developed.

3.1.1.3 Retrofit Procurements - For a retrofit program, similar procurement steps are followed for the purchase and installation of lifts and associated accessibility equipment. Transit systems must prepare a capital grant application; prepare equipment and installation specifications; solicit bids and award contracts for both the purchase of lifts and related accessibility equipment and the installation of such equipment; and test and accept the retrofitted buses.

Although the basic procurement process is not significantly impacted by provisions for accessibility features, particular elements of the process require special consideration. In undertaking a procurement program, whether for new accessible buses or for retrofit equipment and installation, the transit system should be cognizant of several policy issues related to equipment acquisition and the subsequent operation of the equipment. These issues, together with suggestions for procurement policies and procedures are discussed below. The discussion focuses on the impacts accessible equipment may have on the procurement process and the functional role of the accessibility-related equipment.

3.1.2 Capital Grant Application for Accessible Buses - Applications for capital grants are often prepared and submitted in two stages, a pre-application and final application. A pre-application is not mandatory, but serves to quickly ascertain the probable eligibility of the applicant for funding and the availability of funds. The final application presents sufficient planning, engineering, financial and legal data to permit UMTA to decide if the project is eligible for funding.

Although the procedures for completing most sections of the pre-application and final application are not impacted, the estimated project budget and the narrative statement are two parts which require special attention. In the budget for new bus purchases or for a retrofit program the applicant must include the costs of lifts and spare parts, securement devices, and other associated accessibility features in the estimate of project cost. In the program narrative several elements are affected by the accessibility program and by recent initiatives by UMTA to reduce the paperwork burden on applicants.⁽³⁾ The following discussion highlights the major changes:

- Project Description (Exhibit A of the application). UMTA instructs procuring systems to provide as much detail as available for the equipment being purchased. For new bus purchases, this detail should include the size of the vehicle, passenger capacity, engine type and any special or optional equipment. The standard White Book ADB specifications cover most equipment, including most of the accessibility aids, and can be used as a guide. For either ADBs or other buses, the applicant should make mention of the wheelchair lift option to be included in the procurement offer. For a retrofit project, this detail should include descriptions of all proposed accessibility-related improvements, including the wheelchair lift, securement devices and other accessibility aids.
- Public Transportation System (Exhibit B of the application). If an updated description of the current system is on file, the applicant need not submit this exhibit with the application.
- Project Justification (Exhibit C of the application). Usually devoted to describing the benefits the general population would receive as a result of the new bus purchase or other capital improvement program, this exhibit should also describe any mobility benefits the transportation handicapped population would likely receive. The exhibit should identify proposed changes in service levels effectuated by additions to the accessible fleet; efforts to promote increased ridership by transportation handicapped users; and associated mobility impacts on this target group. Reference should also be made to the system's certification of special efforts, filed in accordance with the Department of Transportation's Interim Final Rule.

3.1.3 Accessible Equipment Specifications - The transit system is responsible for preparing specifications detailing the configuration and performance requirements for the proposed purchase.

3.1.3.1 ADB Specifications - For new ADBs, the White Book provides most of the technical specifications for accessibility-related features. There are three ADB manufacturers; two offer only a front door lift and one only

a rear door lift. A transit system using federal funds is not permitted to specify front or rear door lift because by doing so the bidding would no longer be competitive. Furthermore, the system must accept the low bid even if the lift location or other accessibility components are not to their liking if they intend to use federal funding.

3.1.3.2 Non-ADB Specifications - If a bus other than the ADB is selected for purchase, such as the "New Look" bus or an articulated bus, the system has more flexibility and responsibility for developing the specifications. For example, the location of the lift and the specific type of lift device must be determined. The purchase decision between ADBs or other full size coaches, however, is a major one. For other coaches, transit systems can specify accessibility components that conform to equipment currently in or planned for the accessible fleet. By doing so, accessibility equipment can also be selected which may be more suitable to operating and maintenance policies of the particular system. The bid package must include specifications for the lift, passenger assists, seating configuration, and securement devices.

3.1.3.2 Retrofit Specifications - If planning to undertake a retrofit program, the transit system must prepare technical specifications for lifts, securement devices and passenger assists to be installed. This requires an awareness of the characteristics, requirements and limitations of currently available technology. For instance, not all lifts can be accommodated by all models of buses. One determining factor is whether or not the bus has power steering. A recent study sponsored by the National Cooperative Highway Research Program provides detailed information about lift and securement devices and is a helpful reference.⁽⁴⁾ However, as models frequently change, it is also advisable to contact the manufacturers directly. A partial list of current lift manufacturers and installers, their addresses and telephone numbers is presented as Exhibit 3-1.

In addition to the particular equipment selected, two lift installation factors must be considered before undertaking a retrofit program. First, some lifts and associated components are designed to be integrated within the vehicle structure. Thus, retrofitting may require that hydraulic and electrical lines be rerouted through vulnerable areas of the bus when the lifts are installed. Occasionally, the location of other subsystems such as door mechanisms and power steering reservoirs may also need to be moved. Certain structural members may have to be notched or removed.

EXHIBIT 3-1
LIFT MANUFACTURERS AND INSTALLERS (a)

Lift Manufacturer

TRANSPORTATION DESIGN AND TECHNOLOGY (TDT)
9345 Cabot Drive
San Diego, California 92126
(714) 566-8940

LIFT -U-INC.
5th Floor
Third and Lenora Building
Seattle, Washington 98121
(206) 624-5556

VAPOR CORPORATION
Transportation Systems Division
6420 West Howard Street
Chicago, Illinois 60648
(312) 631-9200

GM TRUCK AND COACH
660 South Boulevard East
Pontiac, Michigan 48053
(313) 857-4054

TRANSILIFT EQUIPMENT, LTD.
No. 5
4826 11 Street, N.E.
Calgary, Alberta T2E 2W7 Canada
(403) 276-7818

ENVIRONMENTAL EQUIPMENT CORPORATION
310 Preda Street
San Leandro, California 94577
(415) 568-1422

Lift Installers

ATLANTIC RESEARCH CORP.
Mobile Systems Department
5390 Cherokee Avenue
Alexandria, VA 22314
(703) 642-4389

BLITZ BUS AND TRUCK
4525 W. 26th Street
Chicago, IL 60623
(312) 762-7600

MIDWEST BUS REBUILDERS
1940 W. Stewart Street
Owosso, MI 48867
(517) 723-5241

NIMCO
Bus Division
252 Doremus Avenue
P.O. Box 5305
Newark, NJ 07105
(201) 589-9265

(a) This is a partial listing of lift manufactures and installers

Second, the doorway may not be wide enough to permit entry and/or turning of a wheelchair. Widening this area may require considerable structural work. These factors not only increase the cost of the lift over one installed at the factory, but may also adversely affect subsequent maintenance.

3.1.4 Accessible Equipment Performance - Whether ordering ADBs, "New Looks," articulated buses, small/medium buses, or retrofitting, it is important to know the physical and operating characteristics of wheelchair lifts and other accessibility features. The design and performance of the accessibility-related components impacts the operating policies for accessible service (discussed in Chapter 4). These impacts should be considered during the preparation of equipment specifications. Information from the manufacturer should be requested when policy decisions are made. This information might include:

- . Type of securement device,
- . Inclusion of seatbelts,
- . Direction that securement areas face, and
- . Lift platform dimensions.

Unless this information is obtained during the procurement phase, some policy decisions cannot be made until after the buses have been delivered. This delay could constrain the phase-in process. Relying on the White Book alone may not be adequate since it defines only baseline specifications.

As a guide to preparing specifications for accessible equipment, this section describes how the various equipment components of an accessible bus perform. Detailed explanations of wheelchair lifts, securement devices, and other accessibility features are provided in three separate subsections.

3.1.4.1 Wheelchair Lifts - A level change device is the primary component of accessibility. Two potential technological options are a lift and ramp. To date, no standard size bus is available with a ramp. Although this technology may be developed in the future, the lift is currently the predominant means of boarding passengers who cannot use steps. Available lifts are commonly categorized as either "passive" or "active".

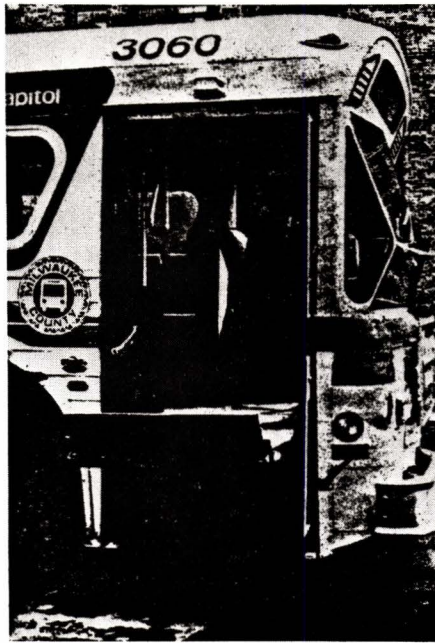
- . Passive Lifts are designed to be mounted in an existing doorway. When it is not being used as a lift (passive state), it does not impede the use of steps in the same doorway, as shown in Exhibit 3-2. A passive lift typically consists of

EXHIBIT 3-2

OPERATION OF A PASSIVE LIFT



1. - STEPS UNFOLD AS LIFT IS ACTIVATED.



2. - PLATFORM IS READY FOR ALIGHTING AND LOWERING.



3. - LIFT IS FULLY DEPLOYED. SAFETY FLAP IS LOWERED; AND PLATFORM IS READY FOR ALIGHTING OR BOARDING.



4. - ONCE PASSENGER IS POSITIONED ON PLATFORM, SAFETY FLAP IS RAISED.



5. - PLATFORM IS RISING TO FLOOR HEIGHT.



6. - LIFT IS FULLY RAISED AND PASSENGER PROCEEDS TO SECUREMENT STATION. LIFT IS STOWED TO COMPLETE CYCLE.

a set of hinged steps that extend outward and flatten into a platform which moves up and down. A safety flap at the outer edge prevents the chair from rolling off the platforms. Passive lifts are used on full size and articulated transit buses and have also been adapted to smaller 25 foot buses.

Several lifts, including the Transportation Design and Technology (TDT), Transi-lift, General Motors, and Vapor lifts, are "elevator" types; once the steps have flattened the platform moves up and down within the existing stepwell. By being fully contained within the bus, the elevator types provide users with a feeling of security. But to facilitate boarding, the bus must be fairly close to the curb or passenger-loading area. Other lifts, including those produced by Lift-U Inc. and Environmental Equipment Corporation (EEC), extend further out from the vehicle and move in an arc pattern while lifting passengers into the bus. While properly positioning the bus for boarding may be easier to execute, the arc movement may pose limitations on the use of the lift for standing passengers due to its motion and limited head clearance of about 66 inches.

- . Active Lifts consist of a vertically stowed platform which folds down and is then lowered into position. Some portion of the lift must unfold to expose or form stairs whenever the bus doors open. These types of lifts are not as suitable for fixed-route transit buses as they block the doorway in which they are installed and must be activated each time any passenger desires to use the door.

Wheelchair lifts can be ordered as standard equipment on ADBs by simply selecting the lift or elevator alternative in the configuration alternatives specification sheet as shown in Exhibit 3-3.

A particular lift manufacturer, model, or loading location is not specified in ADB bid documents. Rather, the ADB manufacturer selects the lift equipment to meet design and performance requirements delineated in the ADB standard specifications.

EXHIBIT 3-3
LIST OF AVAILABLE CONFIGURATION ALTERNATIVES
ON ADVANCED DESIGN BUSES

The following list indicates by check marks the basic configuration alternatives selected by the Procuring Agency.

SECTION NO.	CONFIGURATION	STANDARD	ALTERNATE
1.5.1	Dimensions	<input checked="" type="checkbox"/> 102" Width	<input type="checkbox"/> 96" Width
		<input type="checkbox"/> 40' Length	<input type="checkbox"/> 35' Length
2.1.6.2	Steps	<input type="checkbox"/> White Step Edge	<input checked="" type="checkbox"/> Yellow Step Edge
2.1.1.8	Advertising	<input type="checkbox"/> No Exterior Frames	<input type="checkbox"/> Exterior Frames
2.2.1	Rear Doors	<input type="checkbox"/> Driver-controlled	<input type="checkbox"/> Passenger-controlled
2.3.2.1	Seating Arrangements	<input type="checkbox"/> Transverse	<input type="checkbox"/> Perimeter
2.3.2.3	Drivers Seat	<input type="checkbox"/> Standard Seat	<input type="checkbox"/> Air Cushioned Seat
2.3.2.4	Seating	<input type="checkbox"/> Hard	<input type="checkbox"/> Padded
			<input type="checkbox"/> Cushioned
2.6.6	Wheelchair Loading Device	<input type="checkbox"/> No Elevator	<input checked="" type="checkbox"/> Provide Elevator
3.1.1	Power	<input type="checkbox"/> Performance equivalent to Detroit Diesel 8V-71	<input type="checkbox"/> Performance equivalent to Detroit Diesel 6V-71

Note: *Emphasis Added.*

Source: Department of Transportation, Urban Mass Transportation Administration
Baseline Advanced Design Coach Specifications, November 1978.

If the system is not procuring ADBs, the lift to be installed in New Look or articulated buses should be open to competitive bidding. In the case of non-ADB procurements or retrofits, design and performance specifications should be detailed enough to ensure the procurement of the desired equipment characteristics, yet flexible enough to invite competitive bidding from several manufacturers.

Specific provisions and requirements for wheelchair lift equipment specifications are discussed below.

- . Lift Location: The location and lift is determined by the bus manufacturer. For example, GMC currently installs its own lift in the rear doorway of the ADB; Grumman/Flxible installs the Environmental Equipment Corporation's (EEC) lift in the front doorway of its ADB. There are advantages and disadvantages to both locations. The advantages of a front door lift include the following:
 - the driver has good visibility and enough maneuvering space for bringing the front of the bus close to the passenger loading area;
 - the driver has full view of the passenger during the loading process;
 - the driver can usually operate the lift without leaving the driver's seat; and
 - The driver is not required to assist in fare collection since the fare box is located at the front of the bus.

The major disadvantage is that the front right corner of a bus is vulnerable and highly susceptible to impact; therefore, a lift installed in the front door may require frequent maintenance and repair. Another disadvantage is the amount of maneuvering required on the part of the wheelchair user. Because securement accommodations are generally located at the first set of forward facing seats, the wheelchair user must negotiate the narrow aisle between the doorway and the securement area.

On the other hand, a lift installed in the rear door is protected from damage and components can be mounted high inside the vehicle. Moreover, the wheelchair securement position can be placed directly across the aisle from the doorway for ease in maneuvering. Another benefit is that this area of the bus may be less crowded than the front of the bus. Two major disadvantages must be considered:

- the bus driver must leave his or her seat to go to the doorway to operate the lift; and
- the bus driver often may not be able to get the rear door close enough for the lift to reach the sidewalk.

The first consideration will slow the loading and unloading process. The second consideration could reduce the accessibility of transit service. Another potential problem is fare collection. Since lift users will board in the rear doorway and wheelchair maneuverability is limited, alternate provisions must be made for collecting fares.

- Wheelchair Loading Platform Area: Although an area of no less than 34 inches wide is specified in the White Book, the loading platform and aisle should have at least 32 inches of clear space between any handrails to allow wheelchairs to board. A study by the California Department of Transportation (Caltrans) also concluded that the usable length of the platform should optimally be 53 inches to comfortably accommodate all wheelchairs; a minimum of 45.5 inches was advised. (5) Several currently available lifts provide only 40 to 48 inches between the front of the lift and the safety flap.
- Safety Devices: Lifts come equipped with various safety features to prevent injury to users. Most prominent is a raised security gate or safety flap. This gate drops to sidewalk or street level once the lift is lowered and forms a sloped edge from the passenger boarding area to the lift platform. Once the user is on the lift, the security gate folds up to provide a vertical barrier for keeping the wheelchair from rolling off the street-side edge of the lift. Security gates should, at a minimum, be seven inches in height.

Other safety features which should be specified include :

- Front partition - prevents the wheelchair from rolling forward into the unprotected opening between the lift and the body of the bus;
 - Self-leveling device - maintains a level platform regardless of the sidewalk slope or road crown;
 - Sensing device - deactivates the stow control as long as there is any weight on the platform; in this way the lift platform cannot fold into steps while someone is on the lift;
 - Handrails or raised rims - provide protection from rolling or falling off the platform; they should be placed on any portion of the lift which operates outside of the bus stairwell; and
 - Non-skid textured surface - provides added traction for maneuvering wheelchairs, particularly in inclement weather.
- . Handrails: In preparing specifications, specific handrail types and location should be identified. Lift devices can be equipped with handrails to assist wheelchair users and non-wheelchair users. Handrails support and stabilize passengers during the operation of the lift. Handrails attached to the lift platform directly provide passengers a more stable ride than handrails or vertical assist poles located adjacent to the lift. Ideally they should extend along both sides of the lift so that they may be reached from the front and back ends of the lift.
- . Walk-on Provisions: Many transit systems may want to extend the use of the lift to non-wheelchair passengers. Potential standing users include the semi-ambulatory and persons traveling with passengers using wheelchairs. The design of the lift - - its performance, width, head clearance and support provisions - - to a large degree determines standee user policy.

Some lifts may pose safety hazards to standees. These occur because of the configuration of the door in terms of head clearance and/or the lift's path of movement. Currently, the elevator type lift in which the standing lift user is raised to bus floor level inside the bus provides adequate headroom for all standing users. The arc design lift however carries standing passengers past the door frame at the end of the rise. The standee who is taller than the door frame (approximately 66 inches on some models) would be required to duck to enter the bus. Given this height limitation, a policy of allowing walk-on users is hazardous unless a fold-down seat is provided. For any type of lift, a fold-down seat attached to the handrail can provide additional safety and comfort to semi-ambulatory passengers. If a fold-down seat is not provided, the lift platform should be marked to designate the safe standing areas. A sign saying, "watch your head" should be installed. Additionally, padding over the door opening can help prevent injuries to standees.

3.1.4.2 Wheelchair Securement - Whether purchasing new buses or retrofitting currently owned buses, wheelchair securement devices are an integral part of accessibility. The number of wheelchairs to be accommodated, the type of securement device, and the number of additional fold-up seats should be identified. Additionally, layout drawings for entry, maneuvering, parking and exiting of wheelchair passengers should be prepared. These provisions are discussed below.

- . Number of Wheelchair Stations: Two wheelchair securement stations are recommended. The preference for the two spaces is based on the desire to accommodate handicapped persons traveling together as well as independent travelers whose trips overlap. It also appears that two securement provisions can provide adequate wheelchair capacity without causing maneuvering difficulties which may occur with three or more positions.

- . Fold-Up Seats: Wheelchair securement stations should be fitted with fold-up seats to avoid a reduction in seating capacity when there are no wheelchairs on board. Securement devices are installed underneath the fold-up seats. These seats have to be

released and raised manually. This may pose a problem for handicapped riders with limited manual dexterity and strength. Assistance may be needed from the driver or another passenger.

A decal or sign should be prominently displayed on the seat itself, side wall, or window, stating that seated passengers may have to vacate these seats for wheelchair users. Sample wordings that have been used by various systems include:

- As a courtesy, please take another seat when this area is needed for wheelchair securement.
- Priority to wheelchair handicapped.
- Please yield these seats to handicapped or elderly when needed. Thank you.
- This seat folds up to provide space for wheelchair passengers.

- . Securement Device: Currently, there is no securement device available that can fit all wheelchairs, clamp them securely in place, and be easily operated by any wheelchair user regardless of disability. The two most commonly used types of securement devices for fixed-route service are the wheel clamp and padded bar.

The wheel clamp is a spring-loaded device which clamps around the large rear wheel of a wheelchair. It is activated by backing into it sharply. This device is released by pushing a lever or rod. The lever or rod generally can be operated by a large number of disabled people. The clamp also can be latched around the vertical frame of wheelchairs having small rear wheels which the clamp could not otherwise engage. However, the standard clamp is not large enough to fit around the "mag" wheels of one particular model power wheelchair. Also, the location of some power add-on units prevents the clamp from engaging the wheelchair frame.

Because wheelchairs come in various widths, spacing between pairs of clamps must be adjusted for each wheelchair. For this reason, the typical configuration is to use only one clamp for one rear wheel. This allows considerable motion of the chair. These clamps tend to spring open in a vehicle crash situation. For this reason, if a single clamp is used, it is generally accompanied by a seatbelt long enough to go around the chair itself (rather than just around the individual).

Another common type of securement involves a padded bar that swings out from under a fold-up aisle-facing seat. The bar is adjustable vertically and pivots back and forth at the wall mount. This device must be "set-up", generally, by the driver before the wheelchair user can move into place. It will provide a stop for a forward motion of the wheelchair, but provides no side-to-side securement. Also, in power wheelchairs with control boxes mounted on the armrests, this bar may damage the control in even a moderately sudden stop. If the wheelchair does not have armrests, the bar will not stop the chair from moving forward until it impacts the occupant.

Due to the safety limitations of the wheelchair clamp or padded bar, agencies should specify that seatbelts be installed at each securement location to provide added security. The safest system consists of three seatbelts attached to three points on the wheelchair frame. The transit system should be aware, however, that the three seatbelt system requires considerable driver assistance. A single seatbelt attached to the floor and looped around parts of the wheelchair near the axles of the rear wheels and passed over the hip area of the user provides a reasonably safe securement. Belts attached to the floor and looped around the waist of a person in a wheelchair are extremely dangerous and can cause internal injuries in a crash or sudden stop situation.

- Securement Location: A key consideration in the location of the securement devices should be maneuverability through the vehicle interior. The typical location in a front door lift-equipped vehicle is past the first aisle facing seats and wheelhousings. For rear door lift-equipped vehicles, securement devices are usually located directly opposite the door and lift.

The preferred configuration from a safety and comfort standpoint is to position the handicapped passenger facing forward. Caltrans' tests have shown that side-facing wheelchairs pose a danger to their occupants in a collision or an emergency.⁽⁶⁾ Rear-facing positions, if equipped with high, padded seatbacks, are the safest in crashes but are the most uncomfortable to users.

3.1.4.3 Other Accessibility Features - In addition to providing wheelchair access, other features can enhance the accessibility of bus service to transportation handicapped users. These are described below.

- Public Address System: The availability of a public address system can improve the accessibility of a transit vehicle for several categories of transportation handicapped passengers. For example, a sight-impaired passenger can be given route and stop information; a wheelchair user can be given instructions for using the lift; and able-bodied passengers can be instructed to wait for the lift to be stowed before boarding. For these reasons, specifications for a public address system should be included in bid packages for all new bus acquisitions and for accessibility retrofit programs.

A public address system option for ADBs can be specified on the Special Requirement Attachment Form contained in the White Book. If the option is selected, the White Book contains standard specifications for a public address system, including the provision of at least one external speaker which

would be used to inform sight-impaired persons of the route of the arriving bus or to inform potential wheelchair passengers that the vehicle is full or that there is an available securement position.

- . Width Options: Another feature which improves accessibility for wheelchair users is the 102-inch wide bus. Although a 96-inch wide bus can and has been adequately equipped to provide full accessibility, the wider bus provides more maneuverability for wheelchair users. This is particularly true in front door loading designs where there is limited space for movement between the doorway, farebox, handrails and driver's platform. Although the 102-inch wide bus is desirable from an accessibility standpoint, the option may not be feasible for all transit systems. In some cases, local and state regulations restrict vehicle widths for reasons of safety. This will preclude the selection of a 102-inch wide bus. Local conditions should be evaluated in making this decision.
- . Signing: To ensure legibility, technical specifications in the White Book provide for a message 12 inches high and 70 inches wide on the front destination sign. In instances where long signs are necessitated, displays should be designed to identify the number and destination of the route. In all cases, the system is encouraged to design highly visible and recognizable signing motifs.

Decals of the International Accessibility Symbol are usually placed on the front, back, and curb side of an accessible bus. Since every lift-equipped bus may not always operate on an accessible run, it is recommended that the system consider installing a removable accessibility symbol. This way, the driver of a designated accessible run can display the sign to designate an accessible, in-service bus. This approach will lead to less on-street confusion for handicapped passengers.

- . Fareboxes: Specifications for installing fareboxes should ensure that the farebox does not restrict wheelchair movement.
- . Kneeling Feature: A kneeling feature lowers the front end of the bus to make the first step closer to the curb or street. This assists handicapped passengers who have some difficulty in climbing steps. The kneeling feature is standard equipment in ADBs. For non-ADB, it should be specified in the bid package. Buses already in the fleet can also be retrofitted for kneeling with the addition of controls, piping, and valves to the front right air bag.
- . Passenger Assists: Handrails and vertical stanchions should be provided to assist standing and seated passengers. These should be placed so that they do not interfere with the movement of wheelchairs to the securement positions. Handrails should be located in the front and rear doorway to assist passengers as they board and alight the bus. These should be on the doors or immediately inside the stairwell in order to be easily grasped by passengers at street level.

A horizontal passenger assist should be located across the front of the bus to steady passengers as they pay their fare. The assists should be arranged to permit passengers to easily reach from one assist to the next as they pass through the doors into the vestibule and through the bus. Assists include overhead handrails, vertical assists, handrails mounted on seats and doors. Technical specifications contained in ADB White Book provide dimensions and minimum performance standards.

- . Exit Signals: Pull cords, push buttons or tape switches should be convenient to all passengers. To ensure that wheelchair passengers can signal their exit, if manually able, a signal no higher than four feet from the bus floor should be located adjacent to the securement areas.

3.1.5 Bid Solicitation and Contract Award - Standard UMTA procedures for bid solicitation, manufacturer offer, and contract award are applicable without revision for the procurement of fully accessible buses or the installation of accessibility equipment into an existing fleet. For procuring new buses, the invitation to bid should include wording such as "advanced design transit coaches equipped with wheelchair lifts."

3.1.6 Acceptance Testing - Testing requirements demonstrate the contractor's compliance with the technical specifications. Acceptance tests include pre-delivery inspections and testing by the contractor and post-delivery inspections and testing by the system.

Pre-delivery tests include visual and measured inspections, as well as operation testing. Guidelines for inspecting ADBs are included in the White Book. A transit system can augment the tests and inspections to ensure that the manufactured buses or equipment have attained the desired quality and have met the requirements of the technical specifications.

At least one vehicle per order, usually the first one off the assembly line, is extensively inspected and a configuration audit is completed. A configuration audit verifies that all equipment and features are located in the correct position and are of the specified dimensions. Inspection instructions are listed in the White Book for all of the technical specifications listed and described in the previous section. Most of the suggested inspection procedures are sufficient for guaranteeing configuration conformity with the specifications. Some optional measurements are suggested in Exhibit 3-4 to further assure proper configuration of the lift equipment and wheelchair accommodations.

Visual and measured inspections are conducted on every vehicle while it is standing still to verify that the components and subsystems appear and function as they were designed. Therefore, each lift should be cycled completely (raised, lowered, raised, and stowed) to verify that the apparatus is operating correctly and smoothly. Specific functions and items to check include:

- . Control box signals are the indicating proper message;
- . Securement devices operate properly;
- . Contact pad on lift is operational;
- . Wheelchair lift safety features are operational;

EXHIBIT 3-4
PREDELIVERY CONFIGURATION AUDIT

<u>Item: Requirements</u>	<u>Acceptance Test</u>
Alternative Wheelchair Loading System (Technical Specification 2.6.6.2. (1):	
<ul style="list-style-type: none">. When system is not in use the steps and passageway appear normal	Verify by visual inspection. Pass or Fail.
<ul style="list-style-type: none">. A passenger on the lift shall be able to obtain support during the entire loading and unloading operation by grasping the passenger assists located on doors or other conveniently placed handrails.	Verify presences and accessibility of handrails. Pass or Fail.
<ul style="list-style-type: none">. The loading platform shall be covered with replaceable or renewable non-skid material.	Verify by visual inspection. Pass or Fail.
<ul style="list-style-type: none">. The platform shall be fitted with devices to prevent the wheelchair from rolling off the ends or sides during loading or unloading.	Verify the presence of a safety device, such as an outward flap that is raised after loading to prevent the wheelchair from rolling off. Pass or Fail.
<ul style="list-style-type: none">. Passenger assists shall be located at specified locations	Verify by visual inspection. Pass or Fail.
Wheelchair Accommodations (Technical Specification 2.5.6.3):	
<ul style="list-style-type: none">. Specified number of securement positions.	Count the number of positions. Pass or Fail.
<ul style="list-style-type: none">. Configuration of foldup seats and securement devices.	Visual inspection. Pass or Fail.
<ul style="list-style-type: none">. Specified type of securement devices.	Visual inspection. Pass or Fail.
<ul style="list-style-type: none">. Exit signal no higher than 4 feet above floor in this area.	Measure distance from floor to exit signal.
<ul style="list-style-type: none">. Adequate space to maneuver wheel chair from loading device to designated parking area and back out. Also a minimum vertical 12 inch clearance is required for foot rest clearance.	Measure aisles and securement area. No width dimension should be less than 34 inches, areas requiring 90 ^o turns no less than 45 inches, and requiring 180 ^o turns space should be clear in a full 60 inch diameter circle. Maneuver a wheelchair in the bus to test.

Source: Department of Transportation, Urban Mass Transportation Administration
Baseline Advanced Design Coach Specifications, November 1978.

- . Brake interlock system while lift is in use is functional; and
- . A leveling mechanism, if used, is performing properly.

The lift should be cycled again after the above listed checks have been completed and clocked. Several procuring transit systems are requiring that a complete cycling take a maximum of 30 seconds.

The kneeling feature should also be tested. Lowering and raising times should be verified and the operation of indicator interlocks inspected. According to White Book specifications, the bus should kneel in less than 1.5 seconds and raise to an operable height within 2.0 seconds.

Post-delivery acceptance tests on each delivered bus may also be conducted. The post-delivery acceptance tests include visual inspection and vehicle operation testing very similar to the pre-delivery ones. Any visual delivery damage is identified and recorded during the inspection.

3.2 Facility Improvements

Capital programs to enable a transit system to provide accessible service include modifications to the system's fixed facilities. These include facilities used by passengers to access transit services and facilities used by system personnel to maintain the vehicles. These modifications are necessitated by the special needs of handicapped passengers as well as the addition of new components to the vehicles.

If federal funding participation is sought for facility improvement programs, the transit system must prepare a capital grant application. In the following discussion, impacts of accessibility-related improvements on the grant application procedure are identified. The remainder of the chapter describes the passenger and maintenance facilities which are impacted by the phase-in of accessible bus service. For each facility, potential accessibility barriers are identified and remedial actions are suggested.

3.2.1 Capital Grant Application for Fixed Facilities - Standard UMTA capital grant application procedures should be used to obtain federal funding for accessibility-related improvements. Section 3.1.1 of this chapter discussed the standard elements of the capital grant application. In general,

funding requests for modifications to a transit system's fixed facilities should be made in conjunction with its ongoing grant application activities. Two sections of the application which should be given additional consideration are the narrative statement and the project budget.

For improvements which are necessitated by the special needs of transportation handicapped passengers, the application narrative should include the following items:

- . A description of the facilities or configuration modifications designed to provide transportation handicapped individuals access to transportation services;
- . A discussion of how these improvements will enhance accessibility; and
- . A description of the benefits the improvements will provide.

For modifications necessitated by the addition of new components to the vehicles, the application narrative should include a description of the facilities and/or equipment needed to maintain and service accessible buses.

In the budget, the applicant should include the costs of all accessibility-related facility modifications which will be used by handicapped passengers and system personnel.

3.2.2 Passenger Facilities - A schedule for accessible service phase-in should include a provision for necessary facility modifications. Several elements and features common to most passenger facilities should be assessed for the accessibility provided to transportation handicapped riders. These include:

- . Wheelchair clearances,
- . Obstructions to ambulatory and semi-ambulatory passengers,
- . Ramp and walkway slopes,
- . Ground and floor surfaces and level changes,
- . Handrails and other assists,
- . Tactile and audible signals,
- . Signing,
- . Illumination, and
- . Elevators.

Guidelines for developing detailed specifications for passenger facilities to ensure accessibility to and use by transportation handicapped individuals have been prepared by the Architectural and Transportation Barriers Compliance Board (A&TBCB) and the American National Standards Institute (ANSI). (7)(8) These sources should be consulted for guidance in the design, construction and alteration of passenger facilities.

3.2.2.1 Bus Stops: Prior to service initiation, bus stops along a proposed accessible route should be examined to determine their accessibility to transportation handicapped individuals. Each stop should be evaluated against a checklist of potential transportation barriers. These barriers include:

- . Blocked access to bus loading area;
- . Lack of ramps or curb cuts;
- . Obstructions such as benches, newspaper racks or trees;
- . Limited space on, or access to, medians used for passenger loading;
- . Gravel, rock, or sand in bus loading area;
- . Lack of access to grade-separated facilities such as at freeway stops;
- . Roadway with a high crown; and
- . Other physical conditions judged to be beyond the mechanical limitations of the lift.

Most of the listed items pertain to barriers affecting the use of the lift mechanism. The on-site evaluation can be performed by transit system staff, along with volunteers from the handicapped advisory committee or public.

If the system has awarded the contract for buses with rear door lifts, the assessment of bus stops should also include a review of pull-in space. In some cases, bus stops may need to be lengthened in order to facilitate pulling the rear door into the curb so that the lift can be deployed. Alternatively, the feasibility of shifting a near-side stop to the far-side of the intersection could be considered.

Bus stops that are free of physical barriers should be designated as accessible. These stops should be identified by a blue international accessibility symbol affixed to the bus stop sign or pole.

There are many types of obstacles which could be present at any given stop. By using the checklist approach, the transit system can compile a profile of each stop and prescribe the improvements needed to remedy the situation. Upon completion of the survey, a list of accessible stops should be developed for each route for distribution to telephone information operators, consumers, and interfacing transit systems. A list of bus stops in need of improvements should be prepared and sent to the appropriate agency. For example, one list might be prepared for a city street department to request priority treatment for curb cuts. Another list might be prepared for the transit system identifying bus stops where relocation is the best remedy. In many cases, these barriers are beyond the direct control of a transit system and should be approached in a cooperative, coordinated manner with the appropriate authority. It should be recognized that these improvements may require capital funds from sources other than UMTA such as the Federal Highway Administration or U.S. Department of Housing and Urban Development.

3.2.2.2 Bus Shelters: Bus shelters can be made through proper design and installation. An accessible shelter design should include adequate depth for a person in a wheelchair. This might mean shortening the benches or widening the shelter to provide enough overhang protection. When a shelter is installed, it should be set back from the curb with enough space to enable a handicapped person to wheel in and out of it. Ideally, access should be from any side so that no excessive distance must be traveled to get from the shelter to the stopped bus. To ensure the accessibility of bus shelters, the guidelines and requirements for dimensional standards prepared by the A&TBCB should be consulted.

3.2.2.3 Park-n-Ride Lots and Terminals: There are a number of barriers to accessibility at park-and-ride lots and terminals. These include:

- . A lack of curb cuts from parking areas to bus waiting areas;
- . An inaccessible bus shelter or waiting area;

- . The lack of designated parking spaces for handicapped passengers;
- . A lack of benches for waiting passengers; and
- . A lack of tactile pathways and schedule information for visually impaired passengers.

Transit systems should modify facilities prior to the initiation of accessible service on the routes which serve the specific facility. For detailed specifications for many of the modifications to mitigate access barriers, the transit system should consult A&TBCB and ANSI guidelines.

3.2.2.4 Information Centers: Transit systems may need to program modifications to their information centers to accommodate transportation handicapped passengers. All passengers should be able to enter an information center or ticket sales office to obtain service information and purchase tickets or passes. Modifications, such as ramps, wider doorways, door handles replacing door knobs or electronic doors, and lower counters and schedule racks should be made prior to the start of accessible service so the new passenger who uses a wheelchair can obtain brochures, timetables and maps for accessible routes.

3.2.3 Maintenance Facilities - Two major areas within the garage compound are impacted by the arrival of accessible buses. The first is the work area. If most work is done in pits rather than on lifts, it may be necessary to modify the pit so that the wheelchair lift can be worked on from below. Typically, the pit area measures 4 feet by 40 feet. A sidecut of 2 additional feet at the location of the lift is sufficient for proper lift maintenance and repair activities. If lifts are in the same doorway in all buses of an accessible fleet, the pit should be extended at the appropriate location. If, however, lifts are located in the front doorway of some buses, but in the rear doorway of other buses, the pits should be modified at both lift locations. Removable grating should cover the extended sidecut to permit the bus to drive onto the pit work area while allowing easy access to the lift componentry from below. Adequate space should also be created for parts storage for the accessibility components. These modifications should be identified promptly and remedied before the vehicles are delivered.

The second area is the yard or bus storage area. In order to assure that accessible buses are assigned to accessible runs and accessible spares can be dispatched to replace an inoperable accessible bus, it may be necessary to modify the storage system

so that accessible buses are isolated from non-accessible ones. This is discussed further in the next chapter. Accessible buses should be stored in a manner which makes them readily available and identifiable for dispatching.

The storage location should include enough space for the driver to cycle the lift before pull-out; alternatively, a location could be designated in the yard for lift cycling. The former may require restriping the yard to provide wider lanes.

Modifications in the vehicle storage area, therefore, will generally consist of a reorganization of the storage area and visible designation of accessible or non-accessible storage bays, tracks, or slots. Ideally, lift-equipped buses would be stored indoors to protect the hydraulic system of the lift from weather damage. However, if these facilities do not currently exist, it is not necessary to undertake such a large capital investment solely for storing accessible buses.

* * * * *

The basic procurement process is not significantly impacted by the introduction of accessible equipment. This chapter described new additions to the specifications to enable effective use of the lift, kneeler, and securement devices. A number of recommendations regarding local options for securement devices were made. Most notable of these include the following:

- Two securement areas should be provided on each bus;
- A padded bar or wheelclamp should be supplemented with a seatbelt to secure the wheelchair frame as the adequate type of securement device; and
- Forward-facing securement devices will provide a safe, comfortable ride.

Accessibility modifications to transit system facilities should also be programmed to coordinate with the service phase-in. These include passenger facilities, such as bus stops, shelters, park-n-ride lots, and information centers, as well as maintenance facilities. Modifications to the passenger facilities should be completed before service begins; modifications to maintenance facilities should be completed before the first bus is delivered.

FOOTNOTES: CHAPTER 3

- (1) U.S. Department of Transportation, Urban Mass Transportation Administration, Baseline Advanced Design Transit Coach Specifications, November 1978.
- (2) Notice of Proposal Rulemaking, published in Federal Register, Volume 46, Pages 49,038-49,040, October 5, 1981.
- (3) U.S. Department of Transportation, Urban Mass Transportation Administration, "Reducing the Paperwork Burden on Transportation Operators," Amendment to UMTA External Operating Manual, published in Federal Register, Vol. 45, No. 53, March 17, 1980, p. 17117.
- (4) Rosenbloom S., "Bus Transit Accessibility for the Handicapped in Urbanized Areas," draft synthesis for the National Cooperative Highway Research Program, NCHRP Project 20-5, Topic 11-13, 1981.
- (5) United Cerebral Palsy Association, Bus Lift Demonstration Project, Side by Side Demonstration Test Results, Draft, February, 1980.
- (6) Stewart, Carl F. and Herbert G. Reinl, California Department of Transportation, Wheelchair Securement On Bus and Para-transit Vehicles, Interim Report No. 1, prepared for the Urban Mass Transportation Administration, April 1981.
- (7) Architectural and Transportation Barriers Compliance Board, Final Rule, Title 36 Code of Federal Regulations, Part 1190, published in Federal Register, Vol. 46, No. 11, January 16, 1981, pp. 4270-4304.
- (8) American National Standards Institute, "American National Standard Specifications for Making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped," A117.1, 1980.

CHAPTER 4
SERVICE PLANNING AND OPERATION

Several activities must be conducted to properly plan for the phase-in of accessible buses. First, the transit system must decide where the need for accessible service is the greatest. Second, routes and headways should be determined. These decisions should consider existing service policies as well as the potential for coordination with other accessible service. Third, operating policies should be reviewed and modified to accommodate accessible service. And fourth, responsibilities should be developed for dispatchers and street supervisors to assure that the designated level of accessible service will be provided. This chapter discusses each of these activities.

4.1 Service Planning

There are four steps to planning accessible bus service. These are:

- . Assess the travel needs of potential users,
- . Select routes to be assigned accessible buses,
- . Schedule the routes, and
- . Coordinate with other accessible services.

When completed, the transit system will have determined when and where the service will operate. A schedule for phasing-in accessible service will have been prepared, also. The system will then be able to consider the operating policies needed to implement the service.

4.1.1. Needs Assessment - Information about the travel needs of transportation handicapped persons is needed to plan for accessible service, both in the selection of routes and the assignment of their priorities for implementation. Specific data items about transportation handicapped persons which are of value include:

- . Geographic location and concentrations,
- . Common destinations,
- . Frequency of travel,
- . Preferred time of travel,
- . Availability of other modes, and
- . Potential for using fixed-route transit.

These data should be collected with statistically valid techniques to assure that they are usable for service planning purposes. There are several problems in developing an accurate and reliable data base. A recent study⁽¹⁾ identified the following problems:

- . The relatively low incidence of transportation handicapped people in the general population,
- . The difficulty of accurately distinguishing transportation handicapped people,
- . The difficulty of determining the latent demand for transportation, and
- . The limited state-of-the-art of transportation planning for elderly and handicapped people.

The low incidence of transportation handicapped people makes it difficult to obtain a statistically valid sample. Sample sizes often are not large enough to precisely identify locations where transportation handicapped individuals live and to where they would travel. There is also some difficulty in defining who in the community is transportation handicapped so that people can be counted accurately. Models for determining the incidence of a particular disability or for predicting the latent demand for accessible fixed-route service have not been developed that produce results that are suitable for service planning.

Less costly tools for gathering information include using secondary data that have already been collected, collecting a limited amount of original or primary data, and using self-identification techniques. These methods are briefly discussed below:

- . Secondary data includes that which has already been collected by a city or regional planning agency, transit system, public or private agencies, and other organizations. Sources that may be particularly useful include:
 - Registration files for reduced fare programs and other special transportation services and programs;
 - Previous local studies, surveys, and records on transportation needs;

- Social service agencies and other public and private agencies, organizations, and institutions that represent or serve segments of the transportation handicapped population; and
- Other accessible transit systems which could provide information on major transportation generators.

Primary data collection involves gathering information directly from elderly and handicapped persons. Suggested methods for collecting primary data include the following:

- Mail questionnaires to a target group of elderly and handicapped persons. Mailing lists can usually be developed from addresses provided by the sources considered to be secondary sources of data.
 - Use citizens advisory committees. They can often assist in designating major transit generators and areas where ridership is likely to be high. The advisory committee may also be helpful in assigning priorities to the routes.
 - Conduct small telephone surveys to screen households for handicapped persons. The screening of a randomly selected sample determines the local incidence rate. It also identifies individuals who can answer more detailed questions on their travel needs.
- Self-identification techniques involve asking transportation handicapped individuals to identify themselves and report their transportation needs to the planning agency or transit system. Techniques for accomplishing this include:
- Wide distribution of self-administered questionnaires in general circulation newspapers, in organization newsletters, through social service agencies, or with utility bills. The questionnaires are completed by elderly and handicapped persons and mailed back to the transit system.

- Arranging a meeting between transportation handicapped persons and representatives of the transit system.
- Registration files of elderly and handicapped persons for reduced-fare or special transportation services.

The second phase of the previously cited study⁽²⁾ tested a data collection method to locate handicapped people and obtain information about their transportation needs. The results showed that telephone screening and interviewing can be a practical and effective way of obtaining a representative sample of transportation handicapped people. The process consists of two steps:

- . conduct an areawide telephone survey to prescreen all households to identify transportation handicapped persons, and
- . interview the transportation handicapped persons located through prescreening.

The sample of individuals interviewed represent the overall non-institutional transportation handicapped population. An important by-product of the survey are statistically reliable incidence rates and trip making rates. These can be used to adjust 1980 Census data on people with physical, mental, or other health conditions that limit or prevent them from using public transportation. Areawide rates should not be applied to small areas without some adjustment.

The test results also showed that a minority of transportation handicapped persons are clients of social service agencies and related organizations. Data from these agencies should not be used as the sole information source. However, it can be an effective tool for locating certain kinds of transportation handicapped people, such as wheelchair users and mentally disabled persons. Because of their low incidence rate, the limited areawide telephone survey recommended by this study would not locate enough of them to provide the level of information needed for planning efforts.

Any information gathered in this step should be as closely related to transit service as possible; i.e., route, corridor, and time of day-specific. The findings will serve as a foundation for the next step - - identifying the routes to receive accessible equipment.

4.1.2 Route Selection - The next step in the planning process is determining the order in which routes are phased into accessible service. Routes which are made accessible in the first phase will form a skeleton system for the transportation handicapped. By successfully meeting their travel needs during this phase, the transit system can build a strong foundation for later expansion of accessible service and for coordinating with other providers.

This section covers three topics including the review of demand for each route and the development of a preliminary list, the review of operating conditions that affect specific route assignments, and the development of a final list of routes to be selected and their order of implementation.

4.1.2.1 Review Demand for Each Route - Every route in the system should be a potential candidate for accessible service. The key determination at this point will be which routes receive service first and what the order is for phasing-in other remaining routes. At the start of the service planning process, a preliminary list of routes to be considered for accessibility should be prepared. This initial list should include routes which meet the following criteria:

- . Serve major generators such as employment centers, shopping centers, central business district, schools, hospitals, theaters, and sports arenas;
- . Serve special generators identified in the needs assessment and by members of the handicapped community;
- . Provide for transfer opportunities with other accessible routes, accessible modes, and accessible feeder service operators; and
- . Complete the structure of the initial skeleton system so that it is usable and covers enough of the service area.

The process of developing the initial list should be based on the knowledge of the system, the findings from the preceding needs assessment, and the input of members of the disabled community who are likely to use the fixed-route service.

4.1.2.2 Review Policies and Operating Conditions - Before the list of routes can be finalized and placed in priority order, a number of operating decisions should be made. These are discussed below:

- . Garage Assignment: In systems operating out of more than one garage, a decision must be made regarding how the first accessible buses will be allocated. Assigning accessible buses to only a few garages has the advantage of limiting the number of drivers and mechanics who must be trained and the number of facilities that may have to be modified. Moreover, spare parts inventories can be kept to a minimum. However, use of only a few garages may limit the selection of routes and service area coverage. This may be especially important during the early stages of implementation or in a partially accessible system.

Maintenance capabilities at each garage play an important role in deciding which will receive the first accessible buses. The availability of tools and spare parts inventory should be considered along with the need to train and possibly hire additional mechanics to provide lift maintenance. A more detailed discussion of maintenance issues is provided in Chapter 5 of this report.

For the garage selection decision, the issues are twofold: first, whether or not all garages will have accessible buses; and second, how much maintenance those garages assigned the buses will perform. The options can be grouped as follows:

- If all garages are assigned accessible buses
 - . All garages perform all lift-related maintenance; or
 - . All garages perform minor repairs; major repairs are done at a central facility.

- If some garages are assigned accessible buses
 - . Each garage is responsible for all lift repairs; or
 - . Each garage is responsible for minor repairs; major repairs are done at a central facility.

The factors impacting the decision of where to assign the buses and where to maintain them include:

- Inventory costs;
- Training costs;
- Response time to road calls;
- Geographic coverage of service; and
- Fleet uniformity within each garage.

Factors vary from one transit system to the next. Because of these local conditions, there can be no one recommended universal depot assignment policy.

- . Geographic Coverage: How the service is distributed throughout the service area is another operating decision affecting route selection. Routes assigned a high priority for accessible service, when viewed together, should form a route network which provides coverage throughout the service area.

Jurisdictions - A system with a multi-jurisdictional service area may wish to allocate accessible service so that each jurisdiction receives at least some service for its transportation handicapped residents. This decision might require different routes to be considered for the initial phase of implementation. Even service areas which encompass few political boundaries may be comprised of a combination of urban, suburban, and rural areas. A policy decision may be needed which weighs the trade-offs between providing full geographic coverage and serving high demand routes.

Equity - Underlying the decision on geographic coverage is the need to satisfy the requirements of Title VI (of the Civil Rights Act of 1964, as amended) and demonstrate the equitability of transportation service within the service area. One standard by which equitability is measured is a review of bus assignments according to service type (local or express) and service area (minority or non-minority). The accessible buses will be the newest buses in the fleet, unless the system has opted to retrofit some of its existing buses. Service with these buses, then, should be distributed throughout the service area in a non-discriminatory manner. However, a unique characteristic of these buses is their accessibility. How these buses can best serve handicapped consumers should be a major consideration in assigning them, particularly in the initial phase of accessible service. Any apparent discrepancies which might result should be documented in the system's Title VI submission.

Distribution - Also included in the geographic coverage decision is an examination of service distribution. Service distribution is concerned with the configuration of the accessible transit network. Alternatives include:

- Providing service in the major corridors in the system in a radial pattern;
- Providing service in the major corridors in the system in a grid pattern; and
- Concentrating service in a particular sector of the service area.

The last alternative provides for a higher level of service. However, the trade-off occurs with limited origins and destinations being served. The other two alternatives provide more coverage of the service area though the distance between routes is greater.

- Frequency: To guide schedule makers in the later stages of service planning, it is essential that a policy regarding the level of accessible service be adopted. The range of options follows along a continuum. At one end is the option of operating a small number of routes with only accessible buses. The opposite of this is to operate at least one accessible bus on as many routes as possible. The middle ground is to establish a policy headway for accessible service (perhaps 30 or 60 minutes depending on the system's characteristics) or to provide base period headways at all times. Essentially, the frequency policy is a tradeoff between:

- Many routes selected, each with a low frequency of service; or
- Fewer routes selected, each with a higher frequency of service.

If it is desired to make service available on as many routes as possible, high frequency service may have to be sacrificed. More origins and destinations can be served by this alternative, and vehicles can be distributed throughout more of the service area. The handicapped passenger, though, may perceive these headways to be excessive, particularly when a designated accessible run cannot be met or a crowded bus cannot be boarded. If this alternative is selected, the schedule adherence should be emphasized for these accessible trips so as to avoid any unnecessary hardships on waiting passengers. Additionally, special consideration should be given to coordinating the schedules of these routes to ease the handicapped passenger's possible transfer from one accessible route to another.

With the latter alternative, fewer origins and destinations are served and a smaller number of disabled people are offered service. However, those that can use the routes are provided with a service frequency that approximates service levels

provided for able-bodied passengers. Missing an accessible run, though still a major problem, does not have as severe an impact as it would with lower frequencies. Transferring to or from another accessible mode is more convenient to the user and more easily accommodated with high frequencies.

Many transit systems have opted for a limited but high frequency policy similar to the latter alternative and provide base period frequency on accessible service. This means that all buses operating on a designated route in the base period are accessible. This same frequency carries over to the peak period resulting in about every other bus being accessible. (This of course varies with the peaking characteristics of each route.) This frequency policy has been implemented successfully by several transit systems operating only fixed-route accessible buses (and not a paratransit feeder service). It is recommended as a good compromise between the desire to make either all buses on a route or all routes in a system accessible. It provides a high enough level of service to make service attractive to potential handicapped passengers while at the same time affords the opportunity to extend a high level of accessible service to a large number of routes.

These considerations were applied while testing the report in Phoenix. A list of 12 evaluation criteria, illustrated in Exhibit 4-1, was developed. The data gathered in response to these criteria are summarized for three selected routes in Exhibit 4-2. This table provided a good reference for subsequent route evaluation and selection.

4.1.2.3 Determine Priority Order for Routes - Travel demand data and policy decisions concerning garage selection, geographic coverage and service frequency provide the framework for establishing priority routes for accessible service. In this step, routes are ranked according to the criteria developed. At a minimum, these include:

EXHIBIT 4-1
PHOENIX TRANSIT
ROUTE EVALUATION CRITERIA

1. Bus Requirements

- The number of lift-equipped buses required to maintain the schedule on the selected routes must not exceed the number of accessible buses available. (A maximum of 12 for the first route(s) selected.)

2. Service Hours

- The selected routes should operate throughout the entire day. Saturday service would be a plus.

3. Frequency

- Service frequency during peak and off-peak hours should be at least hourly on the selected routes.

4. Ridership

- The routes selected should be ones with good ridership. However, routes with existing capacity problems should be considered less desirable.

5. Maintenance

- To facilitate lift maintenance, the selected routes should be ones that operate out of the North Maintenance Facility, or that could be operated out of that facility with the addition of a minimum number of deadhead miles.

6. Interlining

- The routes selected should be ones that can be removed from interlining with a minimum of problems.

7. Transfers

- The selected routes should intersect with other potential accessible routes to provide opportunities for transfers in the future.

8. Paratransit Coordination

- The selected routes should have the capability of interfacing with paratransit feeder service.

EXHIBIT 4-1
PHOENIX TRANSIT
ROUTE EVALUATION CRITERIA
(Continued)

9. Equity

- In order to provide equitable service to all citizens, it would be desirable if the selected routes served one or more minority areas.

10. Major Generators Served

- A variety of potential destinations should be available near the selected routes.
 - ... Employment centers
 - ... Shopping areas
 - ... Social service agencies
 - ... Schools
 - ... Recreational facilities such as parks, museums, libraries, and theaters
 - ... Medical facilities such as hospitals, clinics, offices, and pharmacies
 - ... Churches
 - ... Other important destinations such as banks, government offices, etc.

11. Residential Areas Served

- The selected routes should traverse a mixture of commercial and residential areas. Residential areas should be considered on the basis of:
 - ... Housing type and density
 - ... Population
 - ... Proportion of disabled residents

12. Multiple Jurisdictions

- Routes that serve more than one Valley city area desirable.

EXHIBIT 4-2
EVALUATION OF SELECTED PHOENIX TRANSIT ROUTES

Evaluation Criteria	R o u t e s		
	8 North 19th Avenue	16 South Central	27 East Roosevelt
1. Bus Requirement			
AM Peak	8 (1 articulated)	2 + 1 helper	3
Middy	5 (1 articulated)	1	2
PM Peak	8 + 1 helper	1	3
2. Service Hours			
Weekday	5:35 a.m. - 8:50 p.m.	5:54 a.m. - 6:47 p.m.	5:45 a.m. - 7:18 p.m.
Saturday	5:45 a.m. - 7:22 p.m.	6:17 a.m. - 6:00 p.m.	6:45 a.m. - 7:10 p.m.
3. Frequency			
Weekday Peak	15 minutes (average)	60 minutes	30 minutes
Weekday Off-Peak	30 minutes	60 minutes	60 minutes
Saturday	30 minutes (average)	60 minutes	60 minutes
4. Ridership			
Total Daily Ridership	2,471	776	1,226
Peak Hour Load Factor	.83	.66	.11
5. Maintenance			
Number of trips that pull out or return to the North or South Garages.	North 8	North 0	North 0
	South 10	South 6	South 11
Change in deadhead miles if buses pull out of North Garage only.	+80	+61.5	+88
6. Interlining			
Number of routes that would be affected by removing route under consideration from interlining system.	18 Many trips interline with Routes 1, 9, and 41.	5 Several trips are turn-arounds.	14 A few trips interline with Routes 12, 13, or 28.

EXHIBIT 4-2
EVALUATION OF SELECTED PHOENIX TRANSIT ROUTES
(Continued)

Evaluation Criteria	R o u t e s		
	8 North 19th Avenue	16 South Central	27 East Roosevelt
7. Future Transfer Capability			
Routes that intersect route under consideration.	1, 3, 5, 6, 22, 29, 30, 34, 41, 48, 54, and 58.	Downtown Terminal, 13, 14, 15, and 17.	18, 21, 7, 31, 9, 1, 3, 48, and 58.
8. Paratransit Coordination			
Potential feeder paratransit systems.	HRD; Moon Valley Dial-a-Ride; Maricopa County/Red Cross.	HRD; Maricopa County Red Cross.	HRD; Maricopa County Red Cross.
9. Equity			
Ridership ethnic composition.	White 63.4 Mexican/ American 12.1 Black 8.0 American/ Indian 3.6 Oriental 1.5	White 34.1 Mexican/ American 25.0 Black 33.0 American/ Indian 2.3 Oriental 0.2	White 45.5 Mexican/ American 26.7 Black 13.3 American/ Indian 4.6 Oriental 0.2
10. Major Generators Served			
Employment	Rainbo Baking Co. Phoenix Cement Co. Digital Equip. Corp. Honeywell Info System Crystal Ice & Cold Storage Deninno Ice Co., Inc. Smith Pipe & Steel Co.	Union Rock & Mineral Corp., South Central area	APS Camelback Corporate Center Tishman Biltmore Office Park
Shopping	Christown	South Phoenix area: Broadway & Central	Biltmore Plaza K-Mart — 16th St. & Roosevelt

EXHIBIT 4-2
EVALUATION OF SELECTED PHOENIX TRANSIT ROUTES
(Continued)

Evaluation Criteria	R o u t e s		
	8 North 19th Avenue	16 South Central	27 East Roosevelt
10. Major Generators Served <i>(cont.)</i>			
Medical	Phoenix General Hosp. Baptist Hospital		Maricopa County Health Department St. Lukes Hospital Phoenix Center for the Blind County Hospital
Schools	Moon Valley High School Phoenix Christian H.S. Thunderbird H.S. Washington H.S. AZ College of Dental Careers, Western In- ternational University		Camelback High Schoo Garfield Elementary Edison Elementary
Social Services	Phoenix Jewish Com- munity Center		Acacia Convalescent Center Los Olivos Sr. Center Phoenix Indian Out- reach Center Easter Seals Society Center for the Blind
Government and Other Services	Downtown AZ Driver's License Bureau A DOT DPS Vital Statistics Office Downtown	Downtown	Arcadia Post Office County Health Department Downtown Greyhound Trailways Edison Park

EXHIBIT 4-2
 EVALUATION OF SELECTED PHOENIX TRANSIT ROUTES
 (Continued)

Evaluation Criteria	R o u t e s		
	8 North 19th Avenue	16 South Central	27 East Roosevelt
11. Service Area Observations	Good origins and destinations, employment, service area residential/commercial mix.	Some industry along Mohave; main point of interest is Sky Harbor.	Largely residential; a variety of socioeconomic areas; a mix of apartments, single-family homes; some employment opportunity; lots of shopping 'plazas.'
12. Jurisdictions	Phoenix	Phoenix	Phoenix

- Generators served,
- Garage locations,
- Service area of each route, and
- Frequency of service.

This ranked list should be prepared in consultation with the handicapped advisory committee. The list should include every route in the system as each is a potential candidate for accessible service.

The process used in Phoenix concentrated on picking routes that would best meet perceived needs. Using information provided in the data summaries (Exhibit 4-2), pocket schedules, and the system map, committee members studied the potential value of each route in the system. Numerical scores were not assigned. Rather, each member rated the routes as "poorest", "good", or "best". Five "best" routes were chosen by each member. Collectively, the committee discussed their individual choices. Operational criteria of the transit system (such as garage assignment) were considered as part of the committee's deliberations. A consensus of priority routes was the final result.

4.1.2.4 Develop Phase-In Schedule - After the bus routes are ranked, the vehicle requirements for each route are reviewed. Vehicle requirements for peak, base, evening, and weekend service should be listed for all routes. Any unique requirements such as a special vehicle type (e.g., suburban coach, articulated coach or mini-bus) or scheduling procedure (e.g., a route that is interlined and its buses operate on another route) should be noted, as these may preclude the route from being implemented in the first phase.

The ranked list of routes is then compared to the vehicle procurement schedule of accessible buses. By starting at the top of this list and adding cumulatively, the routes that will receive accessible buses in each bus order can be determined. However, it should be realized that 100 percent of each order will not be placed in daily revenue service. The number of buses satisfying the system's spare ratio requirement should be subtracted from the order size to account for those vehicles which will be reserved for maintenance, inspection, training, and in-service replacements. The remaining buses are scheduled for accessible service.

The resulting schedule should be made available to the handicapped advisory committee and the general public for their comments.

When scheduling the implementation of service in the first phase, it is recommended that a schedule by "sub-phases" be developed (such as phases 1A and 1B) and that service be initiated gradually. The first sub-phase should consist of one or two routes and about one-quarter of the buses. These routes should be operated for a few weeks, long enough to identify any problems. The next sub-phase should not take place until the identified problems are resolved. The number and schedule of these sub-phases should be determined based on the capabilities of the maintenance staff. No route should be implemented until the transit system is confident that its required number of buses can be dispatched and operated according to the published schedule. Overpromising service at this phase could be detrimental.

4.1.3 Scheduling - Routes expected to be implemented in the first phase of accessible service now become the concern of the transit system's schedule makers. Several major decisions need to be made before the schedules are finalized.

- . Any routes which are interlined (the bus operates on more than one route) may need special attention from the scheduler. The potential for designating the second route with which the first is interlined as an accessible route should have been considered previously. The reasons for the route's being interlined should be reviewed along with the feasibility of splitting the two routes. Routes that are scheduled with computer techniques (e.g., RUCUS) may be heavily interlined. Selection of one route in the package may require removing it from the system and cutting the accessible service schedule manually.
- . Procedures for relieving drivers by switching buses rather than meeting the bus on the street should be reviewed. It may be necessary to relieve the driver of an accessible bus by keeping the bus in service rather than dispatching the replacement driver with a new, possibly non-accessible bus.

These issues may have emerged during the route selection process and need to be resolved at this point in the planning process. Other issues are resolved during the scheduling step. These are discussed in this section.

4.1.3.1 Cycle Time - The calculation of cycle time is the first step in preparing the schedule for an accessible route. Cycle time is the sum of round trip travel time, boarding and alighting time, and layover time. The introduction of accessible equipment may prompt adjustments in any of these estimated times, most notably the time for boarding and alighting passengers.

Information collected by the Transportation Systems Center indicates that the amount of time used to board or alight an accessible bus averages between 2 1/2 to 3 minutes.⁽³⁾ Some systems have reported boarding times of less than one minute. A key determinant is the driver's and passenger's familiarity with the lift and securement procedure. As ridership and mechanical problems may occur on a sporadic basis, it may not be appropriate to add extra time to all schedules. Many transit systems have preferred to adopt a "wait and see" attitude where additional time is only added to the schedule for specific trips where additional time is repeatedly required for regular passengers.

The success of this recommended approach hinges on the adequacy of layover time for each accessible route. Accordingly, the extent of layover time should be reviewed for all routes being implemented in the first phase. Routes currently operating on a tight schedule are defined as those which do not have at least five or six extra minutes to absorb the average boarding and alighting time of a potential handicapped passenger. It is also recommended that routes with insufficient layover time (less than five minutes) be adjusted prior to implementation of accessible service.

4.1.3.2 Frequency and Span of Service - In the planning of accessible buses a policy should have been developed for the frequency of service. The responsibility of the scheduler is to match this policy with the actual bus assignments for each route. The scheduler must determine to which blocks the accessible buses are dispatched.

Policy guidance is also needed for the span of accessible service. Accessible service should be made available throughout the scheduled service day. Because

vehicle requirements are lower on evenings and weekends, a transit system should consider scheduling a higher proportion of its service during those periods with the new accessible equipment. There are two major advantages to this approach:

- . The system maximizes the use of the newest equipment in the fleet, and
- . Potential handicapped passengers will receive a higher level of service.

With respect to the second point, some systems have reported their highest daily wheelchair user ridership on Saturdays. This has been attributable to the desire to "try" the lift for social or recreational trips at a time when the bus is less crowded. A higher level of service on weekends offers this opportunity.

4.1.3.3 Schedule Coordination - While preparing the schedules for accessible service, the transit system should be cognizant of the timetables for the other accessible routes in the system. At all transfer points, an effort should be made to minimize the amount of waiting time for the transferring handicapped passenger. Ideally, the next bus on the second route should be accessible to minimize the waiting time for the handicapped passenger. During the early phases of accessible service, when relatively few routes are operating with accessible buses, the ability to transfer easily greatly improves the handicapped passenger's mobility.

If the transit system's service area includes or abuts the service area of another transit system, or the route provides access to another mode (such as an airport, train station, or intercity bus terminal), efforts should be made to coordinate the schedules of the accessible trips of the two modes.

Schedules should also be coordinated with accessible paratransit services which can feed the accessible fixed-routes. The minimum level of coordination consists of providing these paratransit services with schedules for the routes which their vehicles can serve. Additional coordination efforts consist of establishing real time communications between drivers of the two systems. For example, when a wheelchair passenger on a fixed-route bus is nearing their destination, the operator of the fixed-route bus could radio the dispatcher, who in turn would

call the dispatcher for the paratransit service and notify them of the passenger's arrival at the fixed-route stop. Conversely, a paratransit operator could time the arrival of the paratransit vehicle at a fixed-route bus stop to coincide with the accessible bus arrival, or even call ahead to find out whether the bus's securement positions are already occupied.

Regulatory constraints should be analyzed to ensure that they do not pose unnecessary restrictions on handicapped travelers. These may include agreements between public transit systems providing service in overlapping areas. For example, a regional carrier may be prevented from picking up passengers along a particular corridor served by a local municipal system. Similarly, some operators of accessible vehicles may be prohibited from operating within airports or outside city limits, while an operator of inaccessible vehicles is permitted to operate in these areas. These constraints can place undue restrictions on the travel of handicapped passengers. The planning of accessible service may present an opportune time to seek regulatory changes so that these restrictions can be removed.

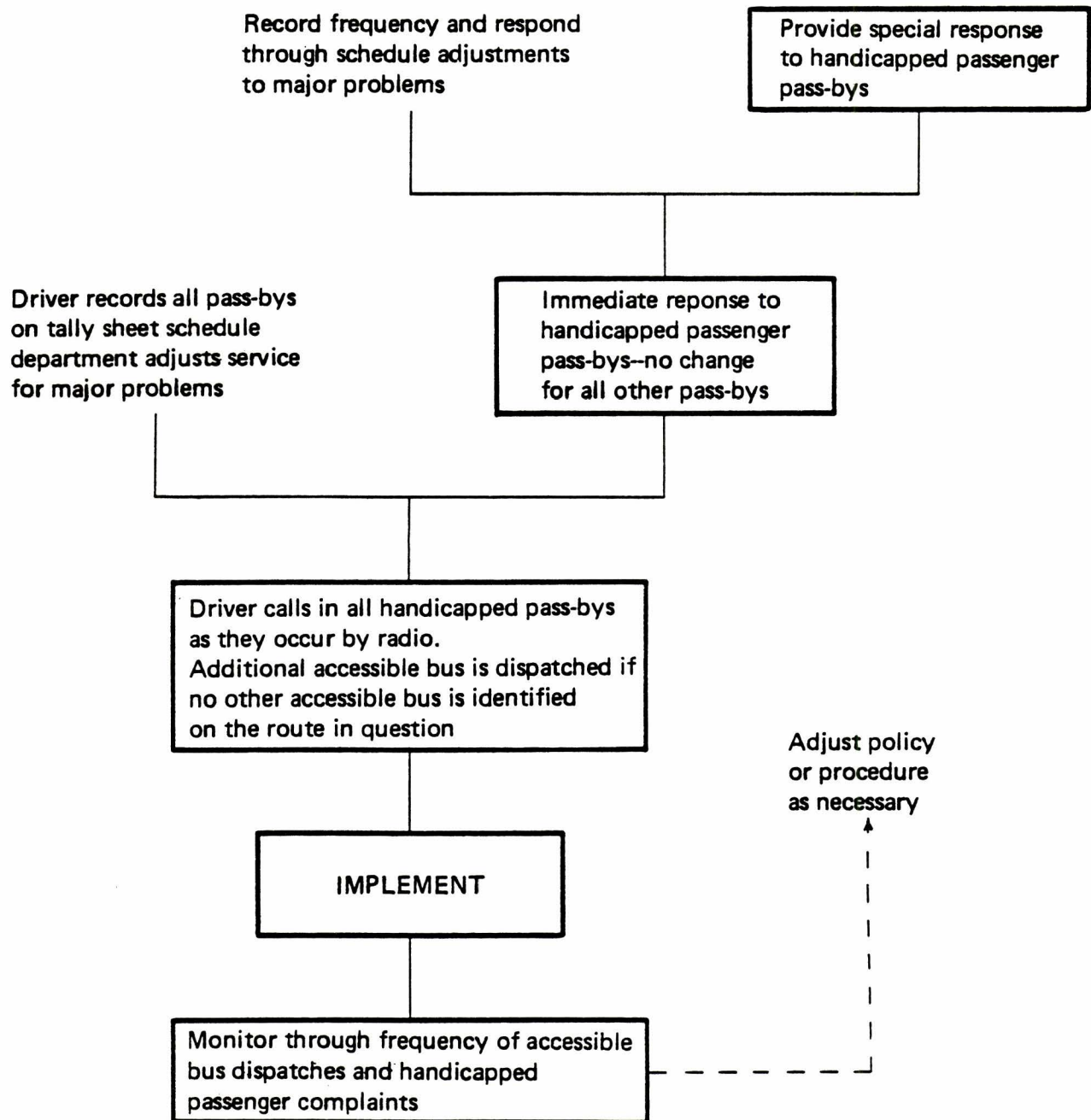
At this point in the planning process, schedules for the routes to be implemented during the initial phase of accessible service are completed. The next step is to determine how these first routes will be operated.

4.2 Service Operation

This section discusses the various aspects of operating accessible fixed-route bus service. Within most transit systems, a separate department is assigned the responsibility for operating transit service. This department is often called the "transportation" department.

There are a wide range of policies and procedures used in the delivery of transit service. The implementation of fixed-route accessible service requires a comprehensive review of these policies and procedures. Policies are usually set by the governing board and are often expressed in general, non-quantifiable terms. It then becomes the staff's responsibility to establish procedures for implementing each policy. An example of this decision-making process is provided for the policy of "pass-bys" of revenue passengers as Exhibit 4-3. With the implementation of accessible service, existing policies and procedures relating to passing-by able-bodied passengers are

EXHIBIT 4-3
OPERATING POLICIES AND PROCEDURES
THE UPDATING, MONITORING
AND REFINEMENT PROCESS, AN EXAMPLE
HANDICAPPED PASSENGER PASS-BYS⁽¹⁾



⁽¹⁾A common transit industry term for passengers who are not picked up by a regular route bus due to maximum loads on-board.

adjusted to deal with handicapped passengers. The flow chart in this exhibit illustrates a board policy of relying on the supervisor to respond to a handicapped passenger's needs in the event of a pass-by. The established procedure was to have the driver notify the dispatcher who in turn instructed a supervisor of the passenger's location. The experience with this procedure resulted in a disruption of the supervisor's other responsibilities, as well as an inability to transport some passed-by passengers in a car because of the type of their wheelchair. The staff tried to modify the procedure but realized that the best solution was to ask the board to change the policy and arrange for van service in the event of a pass-by.

4.2.1 Operating Policies and Procedures - The addition of accessibility components to buses has a considerable impact on the way transit service is operated. This section provides guidance for selecting operating policies that are appropriate for the transit system's environment.

4.2.1.1 Passenger Assistance - The policy decision on how much assistance the driver must give the passenger who uses a wheelchair is affected by the construction of the wheelchair (some power wheelchair models do not fit into the standard wheel clamp), the physical capability of the passenger, and the performance of the lift and securement device. The alternatives for driver assistance range from drivers remaining in their seat and leaving only on an exception-basis, to drivers leaving their seats to supervise all wheelchair users of lifts and securement devices. The location of the lift controls has an impact on this policy. Other design features, listed in Exhibit 4-4, also have an impact. For example, if the lift controls are on the left side of the dashboard and both hands are needed to operate them, it will be impossible to have drivers assist passengers while boarding and alighting. Consideration must be given again to union contract provisions, also.

Boarding - Procedures for boarding wheelchair passengers will vary from bus stop to bus stop and are affected by the crown of the roadway, bus stop locations, and the presence of street furniture. To board a wheelchair passenger, the driver should bring the bus door to a position where there is a clear area of about three by four feet beyond the end of the extended lift. This will provide enough room to deploy the lift and allow for maneuvering the wheelchair on to the lift platform. The loading area should be unobstructed by utility poles, trash cans, fire hydrants and other street furniture.

EXHIBIT 4-4

IMPACT OF LIFT CONTROL PLACEMENT
ON BOARDING ASSISTANCE POLICY

<u>Lift Control Placement</u>	<u>Impact</u>
Controls located left of steering wheel	Driver must remain seated to operate lift
Controls located at top of stairwell	Driver cannot reach controls from street level and must therefore remain on-board the bus to operate lift
Controls located on dashboard	Driver can, with some difficulty, operate controls from lift

In those instances where the bus cannot pull into the proper position at the curb, the bus should be parked between six and eight feet away from the curb so that the wheelchair patron can be assisted down the curb into the street and can board the lift. This provides enough room for maneuvering onto the lift. If the system adopts a policy whereby the driver provides this assistance, it is important that the driver be trained correctly.

In most cases, the proper procedure for assisting is as follows:

- . From the curb - the wheelchair should face inward, toward the sidewalk, and be lowered down the curb backward, rear wheels first.
- . From the street - the wheelchair should face the curb, be tipped up on the large rear wheels and be put up the curb forward, front wheels first.

In both cases, the wheelchair should face in towards the sidewalk. Although often demonstrated as correct, the method of facing the wheelchair out toward the street is not recommended; this procedure is unsafe and uncomfortable for both the driver and passenger. The only exceptions should occur if the roadway is much lower than the curb or is uneven enough to impede the movement of the wheelchair's small front wheels.

Depending on the type of chair, the type of lift, the crown of the road, and the physical ability of the patron, some wheelchairs can better board the lift backward. Some systems require all wheelchairs to board backward so that the weight is inside the vehicle and the person can move backward to the securement area. This does make maneuvering inside the bus more difficult, however. The transit system should work with its handicapped advisory committee before finalizing this policy.

Alighting - The same procedures prescribed for wheelchair boarding apply to wheelchair alighting. The bus should stop at a location free of obstacles with enough clearance to allow the wheelchair passenger to alight. Before deploying the lift, drivers should be sure that all passengers are clear of the area. Before lowering the lift, they should be sure that the wheelchair passenger is safely on the lift with the wheelchair brakes fixed. If for some reason the bus is stopped away from the curb,

depending on the system's policy, the driver may be required to assist the passenger up the curb.

Securing the Wheelchair - Assistance in securing the wheelchair is affected by the type of securement device, as summarized in Exhibit 4-5. Drivers should verify that the wheelchair is secure before moving the bus. Sometimes this determination can be made visually from the driver's seat and with a verbal confirmation; at other times the driver may be required to get out of the operator's seat to physically check the securement. Drivers should also know which chairs, if any, do not fit the securement device and what the policy is for informing waiting passengers that they cannot be transported.

4.2.1.2 Order of Boarding - At most stops, the wheelchair user is not be the only passenger. A policy which stipulates when the lift is to be deployed should be established. The policy should try to minimize dwell time at the stop and reduce congestion around the wheelchair securement areas. The following policy, adopted by many transit systems, is recommended:

- . Boarding: The wheelchair user boards first. While the chair is being secured, other passengers can board. The driver does not pull away from the stop until the chair is secure.
- . Alighting: Step-using passengers alight first. Where possible, they should be encouraged to use the rear door. The wheelchair user exits before any other passengers are allowed to board.

Waiting passengers should be informed that the lift is going to be deployed and that the wheelchair user has priority. This can be accomplished easily if the bus is equipped with a public address system and an external speaker.

4.2.1.3 Restrictions on Use of the Lift - Wheelchair lifts may be helpful to a number of non-wheelchair users of transit service. These potential users include the semi-ambulatory and persons traveling with individuals using wheelchairs. The alternatives range from unrestricted use of wheelchair lifts, to use under direct driver supervision only, to restricted use of lifts to wheelchair users only. A critical criterion in considering these alternatives, as shown in Exhibit 4-6, is the design of the lift itself -- its performance, width and head clearance, and handrails.

EXHIBIT 4-5
IMPACT OF SECUREMENT DEVICE
ON DRIVER ASSISTANCE POLICY

<u>Type of Securement Device</u>	<u>Impact</u>
Wheelclamp	Sometimes difficult for handi-capped person to use, especially to release it; passenger may require assistance.
Padded Bar	Passengers must often be "set up" by driver or aide in order for the bar to be properly placed.
Seatbelt	Since not all passengers may be able to reach it, some assistance may be required to secure seatbelt.

EXHIBIT 4-6
IMPACT OF LIFT EQUIPMENT
ON USE POLICIES

<u>Equipment Characteristics</u>	<u>Impact</u>
Lift moves up and down only	Standees can ride safely inside bus
Lift moves in and out in an arc	Headroom for standees may be limited
Handrails mounted on lift platform	Standees can use handrails for stability while riding lift
Grab bars on doors and dashboards, or vertical assist poles inside rear door	Provide limited stability to standees
Portable seat attached to lift	Ambulatory passengers can ride the lift safely

Tests of the lift equipment should be made with disabled consumers to determine these performance and clearance attributes. If a policy of allowing standees to use the lift is adopted, procedures should be developed which include instructions on how to use the fold-down seat, if one exists, and where to stand. The driver would be expected to caution a rider to "watch your head" in the same manner they would caution a passenger to "watch your step."

4.2.1.4 Use of the Kneeling Feature - Accessible buses are also equipped with a feature to aid those passengers who have some difficulty in boarding a bus but do not require a wheelchair. The kneeling feature lowers the front end of the bus to make the first step closer to the curb or street.

A policy stating when the kneeler is to be used should be established. Many systems only operate the kneeler if a passenger requests it. This assumes that the passenger is aware of the kneeler and feels comfortable requesting it to be deployed. The other common policy is to rely on driver discretion and use the kneeler whenever the driver determines that a passenger will benefit from it. The recommended policy should be based on how close the bus has pulled to the curb, if in fact a curb exists. If the bus must stop away from the curb, all passengers can benefit from a lower first step. Deployment of the kneeler in this case is recommended. It is not recommended if the bus is at or close to the curb. This could damage the front corner of the bus since the curb height may be higher than the lowered height of the bus.

It is recommended that drivers be instructed to use the kneeling feature when the bus cannot pull up to the curb or where no curb exists. Drivers should be instructed to use the public address system, if the bus has one, to warn passengers to stand clear of the bus while the kneeling feature is being activated. Drivers should also be instructed not to operate the kneeling feature until they are certain everyone is clear of the area, and not to allow passengers to stand in the stepwell while the kneeler is being activated.

4.2.1.5 Fare Collection - For a handicapped passenger who has poor manual dexterity and for transit systems operating buses with rear door lifts, existing fare collection procedures may not be appropriate. This is particularly true for transit systems that do not operate

under a pass system. The simplest solution is for the driver to place the fare in the collection box. Where drivers are forbidden to take fares, other procedures are necessary. Systems currently operating accessible service with either front-door or rear-door lifts have developed the following alternative procedures:

- . Asking another passenger to deposit the fare in the fare box;
- . Giving the passenger an envelope to mail in their fare; or
- . Permitting the passenger to ride for free.

This last alternative requires a change in the fare structure for those transit systems that do not permit elderly and handicapped passengers to ride free.

The elements of the existing fare structure have the greatest impact on analyzing how to collect fares from lift users. It is recommended that those systems that have prepared pass and ticket programs expand them to include handicapped fares and encourage lift-using passengers to purchase them.

4.2.1.6 Aides and Companions - Some transit systems have adopted a policy that wheelchair patrons be "self-assisted." With a "self-assisted" policy, the passenger unable to board the bus and use the securement device independently is required to bring an aide or companion. This policy was prompted by an earlier policy decision prohibiting drivers from offering physical assistance while boarding and alighting. Even when some assistance is provided, the transit system should encourage wheelchair patrons to bring an aide or companion with them the initial times they use an accessible bus until they are more familiar with the boarding, securing and alighting process and can maneuver with relative independence.

When aides are encouraged or required, the transit system should develop a fare policy regarding aides or companions. Some systems have developed policies based on the desire to collect one full adult fare for both the passenger and companion. Thus, if the handicapped passenger rides for free, the companion pays full fare; if the handicapped passenger rides at half-fare rate, so would the companion.

4.2.1.7 Priority Seating - The seats close to the front door of a bus as well as the fold-up seats over the wheelchair securement device should be designated as priority seating for transportation handicapped passengers. Decals placed on the wall, window or advertising racks near the seats should request that able-bodied passengers give them up as a courtesy if a handicapped or elderly person boards and wishes to sit there. Drivers should be aware of this courtesy. The system should have a policy which identifies the driver's responsibility for obtaining adherence to the request for the seat.

Wheelchair securement devices are usually placed on the underside of fold-up seats. A policy should be established regarding the driver's role in freeing these seats. If the fold-up seats are occupied when a wheelchair patron wants to board the bus, the operator should request the passenger(s) to relinquish the fold-up seat(s) in favor of the wheelchair patron(s). If the passengers refuse, the driver should know the extent to which he or she is expected to enforce the seating policy. The most common policy is for the driver to only request passengers to comply. If they refuse to do so, the driver then explains the situation to the wheelchair patron and asks him or her to wait for the next accessible bus. Another alternative procedure which can be more effective in having the seats relinquished is for the driver to bring the wheelchair passenger onboard. Once on board, the driver then asks the others to relocate, in which case passengers are far less likely to refuse to move.

4.2.1.8. Safety and Emergency Procedures - The primary safety procedure should stipulate that the driver engage the parking brake when he or she leaves the driver's seat. In the case of accessible service this might include when operating the lift or providing assistance.

Emergency procedures for radio-equipped buses should require that the driver notify the dispatcher of any emergencies. Drivers should have a clear understanding of the correct procedures for handling life-threatening emergencies and bus evacuations. They should know where all emergency exits are located and how to operate them. In cases where wheelchair passengers or other handicapped passengers must be evacuated in life-threatening emergencies, the driver's instructions should emphasize getting the person out of the bus is the first responsibility and that evacuating the wheelchair is only secondary. The

driver should be trained to recognize and aid persons with a wide range of disabilities in emergency situations.

In those emergencies which are not life threatening and the passengers are being evacuated, drivers may be instructed on procedures for lowering the wheelchair down the bus steps. Whether or not to provide this assistance is a policy decision. In situations with more than one step, the safest and easiest procedure is to lower the wheelchair while it is facing forward. At these times it is very important for the driver to listen to the passenger. They will in most cases know the safest and easiest method for handling their particular wheelchair. It is also very important to get help for this procedure. Occupied wheelchairs are heavy and often require more than one person to maneuver them down steps.

Drivers should be instructed on how to operate the lift manually since an emergency may warrant this. Drivers should also notify the dispatcher of the situation on-board the bus. The dispatcher should be able to give guidance on the proper methods for aiding all passengers and notify appropriate personnel such as street supervisors and emergency services personnel who may be able to assist the driver in person.

4.2.1.9 Passenger Pass-Bys -There are three primary reasons for a handicapped passenger being denied boarding of an accessible bus. These are:

- . the securement positions are not available;
- . the lift is inoperable; or
- . the bus is already crowded with other passengers.

For each of these situations, policies and procedures should be developed to clarify the extent of driver discretion, the alternative transportation that might be made available, and how the driver reports the pass-by. Additionally, a policy should be made that requires that the driver explain the reason for the pass-by to the waiting passenger.

Securement Positions Not Available - A passenger may be passed by if the securement positions are already occupied by able-bodied or wheelchair-using passengers, if the devices are inoperable, or if the wheelchair will not fit

into the device. A handicapped passenger with a foldable wheelchair may still be allowed to board if he/she can be transferred to a seat and there is space to stow his/her wheelchair. The safety implications for transporting wheelchair passengers who are not secured and the relative waiting time for the next accessible bus are factors to be evaluated in selecting the policy.

Inoperable Lift - Drivers should be provided with specific guidance for situations when the wheelchair lift fails. The possible responses range from the driver giving only an apology to the passenger, to the driver repairing the lift. Direct communications with the garage and street supervisory personnel are strongly recommended when a lift failure affects revenue service. The procedures to be employed depend on whether or not the bus is radio equipped and the safety considerations of the specific incident.

Training the driver and road supervisors in simple maintenance procedures is recommended as a way to quickly respond to lift failures. Familiarity with the lift operation can alleviate some of the common mechanical problems experienced in the systems currently operating accessible buses. The dispatcher's understanding of the lift operation is also important since the dispatcher should be able to provide quick instructions to the driver who calls in a problem. In some cases, it may not be possible to avoid passing-by the passenger. However, procedures, such as daily cycling, to assure that the lift is operable when it leaves the yard are strongly recommended as a means to minimize in-service breakdowns.

Crowded Bus - Another major reason why a handicapped passenger may be passed-by is if the bus is crowded. One possible solution, if some room is available, is to ask passengers to move to the rear of the bus to make room in the aisle and around the securement position. Sometimes it is necessary to have passengers temporarily exit out of the rear door. Once the wheelchair passenger has boarded, the other passengers reboard. This procedure can be used when a bus crowds up after a wheelchair passenger is on board and the person is "trapped" in the securement area by standees.

Specific operating procedures should be established to assist wheelchair passenger pass-bys. Possible procedures range from the driver taking no action to the driver

recording and reporting all occurrences to the dispatcher. The dispatcher in turn could send another accessible bus or another accessible vehicle to transport the persons. Though this action is applauded, it is not recommended for most systems. Rather, it is recommended that transit systems monitor the reported pass-bys and make appropriate schedule adjustments to minimize the incidence of pass-bys. In the long run, it is recommended that the pass-by policy for handicapped passengers be consistent with the policy regarding able-bodied passengers. Generally, service is reliable and frequent enough that no immediate actions are taken regarding passengers who are passed-by.

4.2.1.10 Testing the Lift - Transit systems now operating accessible equipment have found that periodic cycling of the wheelchair lift mechanism and kneeler leads to more reliable performance and more driver familiarity with their operation. The primary considerations in selecting a policy are the maintenance impacts of cycling the lift, the frequency of usage by wheelchair users in revenue service, and the time available to bus drivers at layover points and at pull out/pull in time. Recent experience with lift equipment has found that cycling the lift once per day is sufficient to insure reliable performance. The responsibility for performing this periodic cycling, on whatever basis, should be assigned on a consistent basis to either maintenance or transportation personnel. Lift testing is discussed in more detail in Chapter 5.

4.2.1.11 Complaints and Discipline - Passenger complaints are viewed by most transit systems as important input to improving transit service. It is recommended that procedures for receiving and responding to complaints be revised to include accessible service-related complaints.

Driver discipline is important in providing good transit service. Most transit systems maintain a carefully documented system of procedures and discipline for bus drivers. These practices should be reviewed in light of the fixed-route accessible transit service operation. It is recommended that new procedures be carefully documented and promulgated to bus drivers to allow effective recognition of any significant changes. This will stress the system's concern for properly implementing the new service procedures and policies as well as the vital role of the driver in assuring its success.

4.2.2 Dispatching - There are a number of important issues which must be considered for dispatching functions of fixed-route accessible service. These include storing and segregating accessible buses, assigning the buses to accessible runs and responding to vehicle shortages.

4.2.2.1 Vehicle Storage - Accessible buses should be stored in a manner which makes them easy to dispatch. The dispatcher's responsibility is to assure that the accessible buses are correctly assigned to the blocks which require accessible buses. To do so may require that accessible buses be separated from non-accessible buses in the storage yard. Most systems store vehicles in one of three ways.

- . First In - First Out Storage: Many systems store their buses randomly, based on return time to the garage. It is recommended that these systems modify this practice to separate accessible vehicles from inaccessible ones. Otherwise, the pull-out of a particular bus may necessitate an excessive amount of vehicle movement in the yard. This could occur, for example, if the accessible bus was behind several other non-accessible buses in the line but the accessible run had an earlier pull-out time than the others.
- . Track to Route Pairing: Some systems store vehicles assigned to a particular route on the same track. All buses in one row are dispatched to the same route. If the entire route has been designated for accessible service, this storage style does not need to be modified. If the route is partially accessible, difficulties similar to those cited above may occur.
- . Constant Bus to Block Pairing: A few small systems attempt to place the same bus and driver combinations in service on the same blocks daily. Such dispatching systems do not present any problems in terms of proper vehicle assignments.

It is recommended that accessible buses be stored so as to avoid any unnecessary movement of vehicles during pull-out times. Both the vehicles and storage areas should be clearly marked as accessible or non-accessible.

Headway sheets should also be prominently marked so that drivers are aware of the type of vehicle that they should have.

Wherever possible, accessible buses should be stored indoors as a precaution against weather damage to the hydraulic systems which provide power to the lift and kneeler mechanisms. The storage location may be designed to include enough space for the driver to cycle the lift before pulling out of the garage. Alternatively, a location might be designated in the yard for lift cycling. An advantage to this alternative is that a mechanic can be assigned to oversee the cycling procedures and respond to any problems.

Vehicle separation may also be useful at other times of the operating day. This is important when an accessible bus is needed to replace one already in service.

Those who work in the yard moving or "hostling" the buses at the end of the operating day are directly involved in the vehicle storage process. The hostlers should be made aware of the locations where accessible buses should be lined up and stored. Their maneuvering of the buses is key to the successful dispatching of accessible buses.

4.2.2.2 Route Assignments - The dispatcher should be provided with a list of accessible routes and their designated accessible runs. The dispatcher will assign an accessible bus to all runs that require accessible vehicles. These assignments, of course, should correspond to the published timetables for the accessible routes.

4.2.2.3 Vehicle Shortages - Directly related to the issue of route assignment of accessible buses are the procedures followed when an insufficient number of accessible vehicles is available. This undesirable situation can occur due to a variety of maintenance and logistics problems for individual garages. The dispatchers' options for responding to this problem situation range from maintaining the maximum amount of accessible service based on particular routes, to re-distributing accessible vehicles to maintain even headways on all designated routes.

A compromise approach which does not disrupt service drastically on any one route is to reduce service on each accessible route. These reductions, when necessary, should be based on reliable information made available to

the dispatcher regarding the frequency of wheelchair use by route and block assignment. These data, whether tallied by the bus driver or recorded by the dispatcher from bus driver call-ins, provide the most effective basis for matching available accessible fixed-route service to anticipated demand from handicapped passengers.

4.2.3 Street Supervision - The street supervisors play a key role in keeping accessible service operating properly. The supervisors are a major link between the driver and the operations manager. They may be assigned the responsibility of responding to lift failures, delays, and passenger pass-bys and collecting data on ridership and delays. Possible responsibilities are discussed in this section.

4.2.3.1 Lift Failures - Street supervisory personnel can play an important supportive role to drivers during lift failure occurrences. Their responsibilities can include recording occurrences, assisting on safety issues, providing direct mechanical assistance for minor problems, and providing alternative transportation for the wheelchair users. The option selected depends on a number of factors, including the number of street supervisory personnel, the back-up resources available, the frequency of lift failure occurrences, and current supervisory responsibilities.

4.2.3.2 Pass-bys - The transit system's supervisory personnel can provide important assistance when a wheelchair user pass-by occurs. This role depends on the transit system's policy regarding wheelchair user pass-bys, the number and severity of these occurrences and the current responsibilities of the street supervisors.

4.2.3.3 Service Readjustments - When an unusual interruption of revenue service occurs, the supervisor often readjusts the service. An excessive delay in boarding or alighting a wheelchair user may be one such cause. In this case, the street supervisor could direct certain buses to operate on an express or limited stop basis to provide more even headways and loading patterns. The level of service operated for both non-accessible and accessible transit service, the number of handicapped passengers involved, and the system's current procedures are some of the factors to be considered in the adjustment of service. For example, if the current procedure calls for turning back a bus before reaching the terminus, the supervisor should be certain that an accessible bus is not turned back with a handicapped passenger on board or waiting to board further down the line.

4.2.3.4 Data Collection - An important function assigned to street supervisors in many transit systems is the periodic collection of data on system performance such as passenger loads and on-time performance. The introduction of accessible service may expand these data collection efforts to include the number of wheelchair users, lift failures and pass-bys. This is discussed in more detail in Chapter 8.

Factors to consider when assigning data collection responsibilities to the street supervisors are the frequency and extent of the data collection activities, the anticipated use of the data, and the current practices for data collection by the street supervisors.

* * * * *

A number of service planning and operations issues have been addressed in this chapter. The key recommendations regarding service planning and operation include:

- . Demand for service on each route in the system should be assessed with a combination of planning exercises and citizen inputs.
- . Accessible service should be operated at base period frequencies until an adequate number of accessible buses is available to increase the service frequency in the peak periods.
- . Schedules with adequate layover time should not be adjusted prior to accessible service introduction. Schedules should be adjusted when actual delays occur.
- . Service should be implemented gradually to identify and resolve problems.

The impact of the new service on a number of operating policies was also discussed. The range of alternatives for each policy was provided. The selection of an appropriate policy in most cases should be based on individual system characteristics, vehicle technology, labor conditions, and existing policies and practices.

FOOTNOTES: CHAPTER 4

- (1) Peat, Marwick, Mitchell & Company, and VERVE Research Corporation, Elderly and Handicapped Data Collection Study, Interim Report No. 1, Data Requirements for Elderly and Handicapped Transportation Planning, prepared for the U.S. Department of Transportation, Urban Mass Transportation Administration, December, 1979, p. V-2.

- (2) Peat, Marwick, Mitchell & Co., Elderly and Handicapped Data Collection Study, Draft Final Report, Dayton Telephone Survey of Handicapped Persons, prepared for the U.S. Department of Transportation, Urban Mass Transportation Administration, June 1981.

- (3) Robert F. Casey, The Accessible Fixed-Route Bus Experience, Cambridge, MA, U.S. Department of Transportation, Transportation Systems Center, May 1981, p. 12.

CHAPTER 5 MAINTENANCE

Consideration should be given in the planning for the phase-in of accessible buses to the impact of lifts and other accessibility components on the maintenance function. The introduction of these different devices to an already sophisticated piece of machinery such as a modern transit bus adds to the level of maintenance required. As when other new subsystems were added to buses, additional staffing, spare parts, and maintenance procedures are required.

The lift is the major focus of the maintenance activities for accessible buses. Other accessibility features, such as kneelers, securement devices, and public address systems will also add to the mechanic's responsibilities. However, the impact of these features when compared to the lift is relatively minor. Accordingly, this chapter provides guidance for incorporating lift maintenance into an overall program. Procedures and frequencies for routine servicing, scheduled preventive maintenance, and unscheduled maintenance are discussed. Staffing requirements to accommodate these additional maintenance responsibilities are adiscussed, also.

5.1 Maintenance Procedures

The introduction of wheelchair lifts, kneeling features and securement devices into a bus fleet requires the development of new maintenance practices and procedures. The maintenance of a bus fleet consists of three basic functions, all of which are affected by the addition of accessibility equipment. The three maintenance functions are:

- . Servicing: Usually performed daily, servicing consists of fueling the bus, checking fluid levels, cleaning the interior, and giving the bus a quick visual check for items such as burned-out lightbulbs. Other high frequency adjustments such as a weekly brake adjustment are often incorporated into the servicing cycle.
- . Scheduled Maintenance: The maintenance of a bus is generally scheduled on a time or a mileage basis. The items that are performed on a time basis are usually specific campaigns such as special work in the spring to assure that all air

conditioners are operational. Work scheduled on a mileage basis is usually part of the Preventive Maintenance (PM) program. A PM program consists of inspection and repair activities which are performed to avoid in-service breakdowns. Fluids and filters are also changed as part of this process.

- . Unscheduled Maintenance: All other maintenance can be described as unscheduled maintenance. All defect repair, body work and unit rebuild work which are not scheduled but performed in response to a breakdown are unscheduled maintenance.

Lift inspection and maintenance should be incorporated into existing servicing and inspection schedules. This eliminates the need for the separate scheduling of lift inspections.

Under any maintenance program the inspection interval recommended by the lift manufacturer should be met. If the manufacturer recommends a weekly or a 1,000-mile inspection, inspections performed beyond these intervals such as monthly or every 3,000 miles will generally void the manufacturer's warranty. Even beyond the warranty period, the manufacturer's maintenance schedule is probably the best for each type of lift and should be followed.

The suggested frequency and extent of lift maintenance varies among the different manufacturers currently producing lifts. However, a typical lift requires a maintenance program of daily servicing, preventive maintenance, and unscheduled maintenance. Each is described in the subsections below.

5.1.1 Servicing - Transit systems using lifts and the lift manufacturers themselves recommend frequent testing. Systems currently operating lifts report that reliability increases with frequency of use. Daily testing is recommended. It offers reasonable assurance that the lift will function properly in revenue service. The testing should consist of:

- . A full cycle of the lift mechanism;
- . A full cycle of the kneeling feature; and
- . A visual inspection of wheelchair clamps, seatbelts and padded arm securement devices.

The testing may be accomplished in a number of ways. Morning testing performed by the drivers ensures that all vehicles have operational lifts when leaving the garage. It also ensures that the drivers can competently perform the lift operating procedure. Unless drivers have sufficient practice, maintaining driver familiarity with the lift controls can become a major problem. Adequate space must be available for morning testing by drivers. This may require restriping the yard into wider lanes to accommodate the fully extended lift.

One disadvantage of morning testing by the driver is that the bus pull-out can be delayed if a lift is found to be non-operational. The delay is caused by the time required to report the defect, have another accessible bus dispatched, and test its lift and other features.

Evening testing of the lift can be scheduled into the daily bus servicing cycle. This testing is usually performed by maintenance personnel. Morning dispatching problems are alleviated because malfunctions are detected before the vehicles are lined up for the morning. It also allows for prompt lift repair if trained lift mechanics are assigned to the evening or night shift. The major disadvantage of evening servicing is that drivers are not required to practice the lift controls and operating procedures.

One other option is to perform both tests. This practice, although more time-consuming, combines the advantages of both testing times and should increase lift reliability. It is recommended that this option be used when accessible service is being introduced. After a period of time, as all personnel become familiar with the lifts, one or the other daily tests may be eliminated.

Whichever testing method is selected, it should be monitored to ensure that the lifts are being cycled daily. A daily report should be prepared indicating which buses were dispatched with operable lifts and which needed repair. The report should be used by the maintenance and transportation departments to identify and correct chronic mechanical problems and areas where service levels and the spare ratio may need to be revised.

5.1.2 Preventive Maintenance - Lift manufacturers typically recommend a two-stage inspection program: a frequent minor inspection and a less-frequent major inspection. A minor inspection generally is recommended at intervals of a week or every 1,000 to 1,500 miles of service. This inspection usually consists of minor cleaning and lubrication. Hydraulic fluid

levels are checked and linkages and slide trays are cleaned and lubricated. Hoses and wiring are given a visual inspection, and any leaks or loose connections are corrected.

A major inspection generally is recommended at intervals of every month or every 3,000 miles of service. An example of a monthly inspection checklist, shown in Exhibit 5-1, indicates the high level of maintenance required for this inspection. Every hose, wire, switch and valve is inspected and tested. This level of inspection requires careful scheduling to ensure that all inspections are performed and required repairs are made on a timely basis.

The design of wheelchair lifts is constantly changing to respond to operative experience. The daily servicing and periodic inspection of the lifts can be affected by these design changes. Preventive maintenance procedures recommended by the manufacturer at the time the buses are delivered may be changed. Therefore, it is recommended that contact be maintained with the manufacturer and recommended maintenance practices and procedures be followed. Maintenance bulletins can help provide this type of updated information.

5.1.3 Unscheduled Maintenance - Unscheduled maintenance is the response to breakdowns. Despite daily testing and frequent inspections, in-service failures occur for a variety of reasons. In systems where the mechanics do the daily testing, the lack of driver familiarity can cause an apparent failure of the lift. Mechanical malfunctions can be caused by the failure of any valve, switch or hose. External forces such as potholes can cause misalignment and binding, and even dirt can result in jammed slides and linkages. The result of any of these potential causes of lift failure is the same problem - - an in-service breakdown.

Wheelchair lifts present no extraordinary unscheduled maintenance problems. Like any other bus subsystem, lifts on occasion break down and require repair. The repair requires trained mechanics, parts, and space within the maintenance facility. Systems using pits for repair have found that side-cuts in the pits improve access to the lift mechanism and reduce the time required for repair. A transit system may also have to make a road call when a lift breaks down. A response to an in-service breakdown or road call for wheelchair lift failure may not directly involve the maintenance department. Minor operational problems may be corrected by the transportation department. When this is the case the maintenance department, nonetheless, should be informed of the in-service breakdowns to ensure prompt attention to all malfunctioning units.

EXHIBIT 5-1
MONTHLY LIFT SERVICING
(SAMPLE)

The following procedures are to be performed on each lift prior to placing them in revenue service. (Engine should be kept running except when noted while performing this inspection.)

- A. Run lift through full operational cycle using driver's controls.
- B. Verify that each sensitive edge responds correctly:
 - 1. Bring lift into platform position; endgate should raise.
 - 2. Press endgate sensitive edge with squared-off end of a 2"x4"x12" piece of lumber; *reset-proceed* should illuminate; press reset button.
 - 3. Lay 2x4 flat under platform and lower lift until outboard (straight) sensitive edge contacts 2x4; *reset-proceed* should illuminate; press reset button.
 - 4. Repeat Step 3 for inboard plan Figure "9" sensitive edge; results should be the same.
 - 5. Failure of any edge to respond should be recorded.
- C. While platform is at bus floor level, inspect underneath for obvious signs of oil leakage; also examine front and rear tower areas; report any leakage.
- D. With steps folded, system off, and engine running, verify that *step out* lamp is extinguished and remains so when jumping on the steps.
- E. Check and add oil, if necessary, to reservoir in engine compartment.
- F. If evidence of leakage is found, remove the hydraulic box cover:
 - 1. Inspect carefully for signs of leakage; tighten fittings as required; check for loose electrical connections or parts.
 - 2. Replace the hydraulic box cover; tighten screws securely; replace missing screws.
- G. Bring lift to platform position at bus floor level:
 - 1. Using compressed air, blow all dirt accumulations from underside of platform, pan slide channels and towers, including scissors slides; *do not wash scissors slides with solvent.*
 - 2. Using mineral spirits and a rag, clean pan slide channels to remove remaining dirt and grease; blow dry with compressed air.
 - 3. Spray scissors slides and pan slides with Dri-Slide lubricant; it is not necessary to flood surfaces.
 - 4. Inspect hoses and platform harness for damage:
 - a. Remove plastic cover from front tower enclosure.
 - b. Using a flashlight for illumination, examine hoses and harness for cuts; lowering the lift toward the ground will help in viewing the hoses from the top.

EXHIBIT 5-1
MONTHLY LIFT SERVICING
(SAMPLE)
(Continued)

G. 4. Continued

- c. With the platform at bus floor level, crawl under the lift and visually inspect hoses and wiring on exposed portions of towers.
 - d. If any hose has a cut in the outer covering that extends into the fabric, it must be replaced immediately.
 - e. Redress any hoses or harness on towers that show evidence of being hit by moving parts.
 - f. Replace plastic cover over front tower enclosure.
5. Check endgate integrity by pushing it down slowly with your hand; endgate should immediately force your hand back; it should not be possible to push the endgate to the down position; sponginess may indicate oil leakage, a defective endgate check valve in the hydraulic box, air in the system, or improper limit switch adjustments.
6. Drop endgate, raise spring-loaded flap, and blow out dirt accumulations from pan; inspect for obvious signs of leakage; repair as necessary; raise endgate.
7. With the lift in the platform position and endgate down, check to see that the actuating levers — No. 57737223 — just touch the stop pins. Adjust the length of the actuating rods — No. 57727213-01 — flat rods with offset — as necessary to accomplish this.
8. Using a tape measure, measure from the end of the lower step channel that supports the pan to the tip of the endgate sensitive edge. This dimension should be $9 \frac{3}{8}'' \pm 1/8''$. Check both front and rear dimensions. Adjust the length of the push rods — No. 57726786 — as necessary to accomplish this. If excessive correction is required, it may be due to bent parts; inspect carefully.
9. Check that all nuts are tightened securely and that all "E" clips are properly in place. Replace all missing clips. If any clips are stretched, they must be replaced also.
10. Lower the platform to the ground and observe the action of the sliding shields; if sticking is noted, spray with Dri-Slide; do not flood surfaces; return platform to bus floor level.
11. Perform platform leakdown test:
- a. Test is performed with an empty platform.
 - b. When platform makes an automatic correction, as evidenced by the platform "hiccupping" slightly, start timing.

EXHIBIT 5-1
MONTHLY LIFT SERVICING
(SAMPLE)
(Continued)

G. 11. Continued

- c. Time the interval until the next "hiccup" occurs.
- d. The interval must be at least 30 seconds; a shorter period may indicate internal leakage in one or both of the platform cylinders or their associated counter-balance valves.

12. Fold up steps and shut off system.

H. Perform a test of the manual pump as follows:

WARNING:

DO NOT ATTEMPT THIS TEST WITH THE LIFT SYSTEM ELECTRICALLY ENERGIZED! FAILURE TO OBSERVE THIS PRECAUTION WILL RESULT IN UNCONTROLLED LIFT MOVEMENT AND MAY CAUSE SERIOUS DAMAGE TO LIFT COMPONENTS. NEVER ATTEMPT TO RAISE THE ENDGATE UNLESS THE LIFT IS IN FULL PLATFORM POSITION, NOR ATTEMPT TO FOLD STEPS WHILE THE ENDGATE IS RAISED. TO DO SO WILL CAUSE DAMAGE TO THE PAN LINKAGE AND/OR MAIN LINKS. NEVER OPERATE MORE THAN ONE MANUAL SELECTOR AT A TIME. ALWAYS RETURN SELECTORS TO THE "NEUTRAL" POSITION ONCE

THE OPERATION HAS BEEN COMPLETED.

1. Insert a pump handle into the pump lever (under the flap at the front of the bus).
2. Facing the front of the coach, push in and turn the left hand (curb side) manual selector; this sets up the lift to form the platform.
3. Operate the pump handle to and fro; observe that the steps start to unfold.
4. When the platform is fully raised, the effort required to operate the pump should increase noticeably.
5. Turn the left hand selector so that the handle is vertical; it should "snap" out into the neutral position; verify this by operating the pump; there should be little resistance and no lift movement.
6. Remove the pump handle and stow it on the clip in the defroster compartment. (Lift should still be in platform position with endgate down, system off, and all manual selectors in the neutral position.)
7. Press *system on* button; endgate should immediately raise.
8. Fold steps and shut off system.

Source: *Practices of the Milwaukee County Transit System Maintenance Department, following Vapor Corporation procedures.*

5.2 Maintenance Staffing

The time and effort required to maintain wheelchair lifts and other accessibility components may warrant additional maintenance department staff. The size of the staff increase is influenced by several factors including the following:

- . The Number of Lifts to Be Maintained: Generally one additional mechanic is estimated to be required for every 20 to 25 lifts, unless there is excess maintenance capacity in which case possibly no additional mechanics will be required.
- . The Number of Types of Lifts to Be Maintained: It is possible to have several different types of lifts in one system. The different types of lifts may require different levels of maintenance. Some have relatively few working parts; others are more complex.
- . The Operating Climate: Snow, ice, sand and dirt all increase the level of maintenance a lift requires.

Other factors concerning staff size are functions of the system's maintenance policies. The first such policy consideration is the job description of a lift mechanic. If the lift maintenance is viewed as a specialized job, then lift mechanics are hired who perform no other work. The use of specialized lift mechanics may result in a higher quality lift maintenance program but also requires more mechanics than if lift maintenance is incorporated into general maintenance activities. If lift maintenance is not viewed as a specialized job, then inspection is done by preventive maintenance inspectors and repair is handled by general purpose mechanics. The latter approach may result in a more efficient utilization of labor.

Many transit systems have addressed this problem by adding general purpose mechanics to their staff and training selected existing mechanics in lift maintenance. These trained mechanics perform all lift maintenance activities but are viewed as general purpose mechanics. They are used for other repair work when not required to work on lifts. This policy is recommended because it increases flexibility and results in better utilization of the available maintenance skills.

A second staffing consideration for systems with more than one garage is the distribution of accessible buses among different operating garages. If it is decided to concentrate accessible buses in one or two garages, then additional mechanics will only have to be hired for only one or two garages. The concentration of accessible buses should have some economies of scale in terms of maintenance, but these may be off-set by excessive deadhead costs (non-revenue time and mileage between the garage and the route). These decisions should be made with careful consideration of the trade-offs.

The final policy consideration concerning maintenance staff size is the scheduling of daily lift testing. If the lifts are cycled in the evenings, trained lift mechanics should be scheduled to work those shifts for defect repair. Trained mechanics are required, however, during the day shift to respond to road calls and to perform other scheduled and unscheduled maintenance. There should be a sufficient number of mechanics to adequately cover these responsibilities.

* * * * *

The proper maintenance of the accessible buses is an important element in the successful phase-in and continuous operation of accessible buses. The manufacturer's recommendations regarding lift inspection and maintenance should be followed. A policy for frequent testing of the lift should be implemented. It is recommended that lifts and kneelers be tested at least once daily as an assurance of proper operation during revenue service. Additionally, the maintenance staff may need additional space to handle the special needs of the accessibility components. If additional staff is needed, it is recommended that general purpose mechanics be added with some existing mechanics selected to be trained in lift maintenance. This provides for better utilization and flexibility of maintenance skills.

CHAPTER 6 TRAINING

The knowledge and attitude of the transit system's personnel regarding fixed-route accessible service can affect the success of accessible bus service. This chapter provides guidance for training and includes the following subjects:

- . Elements of the training program, including training in the use of accessibility features, sensitivity training, operating procedures, and practice sessions;
- . Methods of presenting the training material, including reading material, lectures, audio-visual presentations, demonstrations, and hands-on operation; and
- . Guidelines for establishing a training schedule.

The input and assistance of their handicapped advisory committees and of local rehabilitation professionals should be used in the development of training programs. Their assistance should be sought in reviewing lesson plans, delivering lectures, and demonstrating the use of the accessibility components.

6.1 Training Program Contents

The training program should contain the following four elements:

- . Use of the Accessibility Equipment: A presentation demonstrating the operation of the lift, securement devices, kneeler, public address system, and other new components related to accessibility;
- . Sensitivity Training: An introduction to the special needs of handicapped passengers;

- . Operating Procedures: An orientation to new or revised operating policies and procedures with emphasis on the staff person's role in enforcing a particular policy; and
- . Practice Sessions: Hands-on experience using the equipment as both a driver and a passenger.

Each element is described in more detail in the following sections. Where different training is need for different types of transit system personnel, it is so noted.

6.1.1 Use of Accessibility Equipment - Drivers, street supervisors, dispatchers, and mechanics should be trained in the use and repair of the lift, securement device, kneeler, public address system, and any other accessibility components. The following discussion describes a training program for each of these categories of transit system personnel.

6.1.1.1 Drivers should be taught the proper operation of lift controls, kneeling features, securement devices and public address system. In addition, drivers may also be trained in minor repairs.

Lift Operation - Drivers should be taught enough about the mechanical aspects of the lift to understand the relationships among the various switches and the functions they control. The safety gate is one example of this interplay. The safety gate is the outermost portion of the lift platform. It provides a barrier to keep the wheelchair from rolling off the lift. Improper sequencing of the controls on some lifts can cause the safety gate to drop and allow a wheelchair passenger to fall off the lift. Drivers should be made aware of dangers such as this during their training.

To ensure the safe and efficient operation of the accessibility equipment, the use and effects of master control switches and interlocks should be fully understood by the operators. The front right corner of the bus is often subject to bumping and scraping. Drivers should be reminded of its vulnerability and the additional impact that damage here could have on a front door lift.

Kneeling Feature - Drivers also need to know how to use the kneeling feature in areas with low or no curbs. Drivers should be taught the position and correct operation of switches controlling the kneeling function and their proper sequencing.

Securement Device - Depending on the policy adopted by the transit system, drivers may be responsible for securing the wheelchair passenger into the securement device or at a minimum assuring that the chair is secure. Drivers should be thoroughly familiar with the equipment's operation and with any additional securement device used, such as a seatbelt.

Public Address System - If the accessible bus includes a public address system, the driver should be trained in its use. Training should be twofold. First, the driver should receive technical training in using the public address system. Second, suggested phrasing for situations when the system will be used such as asking people to step back while the lift extends and the wheelchair-using passenger boards should be taught.

Repairs - Depending upon policy, drivers may need to be trained in minor repairs and adjustments to the lift such as the use of override controls and adjustments to the securement devices.

After receiving this information in lecture or written form, drivers should receive hands-on training to assure their comprehension. They should be expected to demonstrate their proficiency in using the accessibility equipment. Their practice session should include repeating the procedures until they are memorized and the skills are learned.

6.1.1.2 Street Supervisors and Dispatchers play a supportive role to the driver. In addition to being familiar with, or even undergoing the driver training, street supervisors and dispatchers should have additional instruction in the following:

- . Minor repairs or adjustments to lifts, securement mechanisms, and the kneeling feature as well as manual cycling of the lift to reset it, if these type of responsibilities will be a part of their jobs;
- . Policies for schedule adjustments to accessible routes; and
- . Proper procedures for supervising and assisting in the emergency evacuation of lift-equipped buses.

The radio dispatcher is often the first person to whom a problem is reported; the street supervisor is often the first person to respond at the site. Accordingly, the individuals in these positions should have skills in "trouble-shooting" mechanical problems. In this manner, when a driver describes a problem the dispatcher can suggest a prescriptive action. This can often enable them to put the bus back in service and negate a mechanic's road call.

6.1.1.3 Mechanics need a comprehensive knowledge of the operation of accessibility equipment and its repair. They need a thorough knowledge of the functions of the accessibility equipment as well as the inspection, preventive maintenance and repair procedures for the accessibility components. Training should be a combination of manufacturer-provided and in-house instruction.

6.1.1.4 Telephone Information Operators need a general knowledge of how the accessibility equipment operates in order to answer questions and provide reliable information to potential users. They need to know whether the lift is installed in the front or the rear of the vehicle. They should be able to answer common questions such as the following:

- . Should passengers board forward or backward?
- . Do wheelchair footrests have to be at a certain height to ease boarding?
- . Where is the securement area?
- . How does the securement device work?
- . Will all models of wheelchairs be able to use the securement device? Are alternatives for securement available?
- . Can a person stand on the lift?

If bus stops have been evaluated for their suitability for lift use, the operators should have a list of each stop's accessibility rating. This assures that users will not wait for the bus where the lift cannot be used safely.

If the transit system provides information service to hearing-impaired persons by way of a telecommunications device (known as a TDD, or sometimes by the older

terminology, TTY) the appropriate staff members should be taught the use of the TDD equipment. Training in the mechanical operation of the TDD equipment itself can often be obtained from the equipment manufacturer or the telephone company. Consumer organizations of deaf persons also can provide this kind of equipment training.

It is important that telephone information operators be taught the protocol of TDD conversations, and be alerted to the machine-to-machine nature of TDD communications (as opposed to voice-to-voice). This entails teaching the proper use of TDD terminology, especially the following:

<u>Term</u>	<u>Definition</u>
GA	Go ahead (similar to the radio operator's "over")
MIN PLS	Minute please
SK	Send kill or send kiss (signalling the end of the conversation)
GA TO SK	Go ahead. I'm ready to hang up when you finish.
GA OR SK	Go ahead. When you finish we can either continue talking or hang up - you decide.

A typical conversation would begin with the information operator answering the phone, immediately placing the handset on the TDD cradle and identifying themselves ending with GA (for example, "Thank you for calling BART information, GA"). The hearing-impaired caller would then type out the request for information, ending with GA. The conversation would proceed with each party typing GA to signal when the other party may "go ahead." If the telephone information operator must leave the conversation for more than a few seconds this should be conveyed to the caller and the message should be ended with MIN PLS. Otherwise, if a long pause in the conversation occurs with no explanation the hearing impaired caller will assume the connection has been broken. Upon returning, the telephone information operator should resume the conversation ending the message with GA. Upon preparing to hang up, either party should signal with GA TO SK or

GA OR SK. Upon receiving GA TO SK, the second party then types SK after the message and the first party types a final SK, (sometimes after adding a concluding sentence) ending the conversation. Upon receiving GA OR SK, the second party has the option of continuing the conversation before signing off as above.

6.1.1.5 Community Relations and Customer Assistance Staff need the same general knowledge about the use of the accessibility equipment (lift, securement mechanisms and kneeling feature) that telephone information operators require in order to disseminate accurate and reliable information and to answer questions knowledgeably. While they do not need to know how to operate the TDD equipment, community relations and customer assistance staff do need to know that the telecommunications line exists for the benefit of hearing-impaired customers and the correct telephone number of that line.

6.1.2 Sensitivity Training - The goal of sensitivity training is to provide information about handicapped people so that transit system personnel can communicate effectively and provide courteous service to all consumers. All personnel having any dealings with passengers or the general public should undergo sensitivity training. This includes management personnel, supervisors, bus drivers, telephone information operators, and community relations and customer assistance staff.

Members of the handicapped advisory committee and local experts can be most helpful in planning the sensitivity training program and developing the materials. They should be able to assist the staff in finding appropriate materials and should be asked to review the draft training program to ensure that it does not contain inaccurate, misleading, or offensive information. It is also suggested that members of the disabled community be involved in the actual conduct of the sensitivity training program to further illustrate the principles being covered.

The sensitivity training programs should focus on attitudes such as:

- . Being disabled is not a tragedy; it is more an enormous inconvenience. Disabled persons are handicapped more by society's attitudes than by their disabilities. They are not sick or necessarily fragile or delicate. A disability is not an illness even when the disability is

the result of a past illness. Handicapped people do not all live at home with their parents or in convalescent hospitals nor is every trip they make to a doctor's office. Actually, handicapped people live very ordinary lives which are as fulfilling as anyone else's.

- . People who are disabled may need more physical assistance than able-bodied persons but they are not thereby helpless and incapable of making their own decisions. Frequently, they do not need as much physical assistance as some people think. Handicapped people live in all parts of the country and have usually developed skills to deal with the climate of their area.
- . Deafness is a sensory disability. Most deaf people are able to speak although they may prefer to remain silent. Lacking the ability to monitor their own voices they may not be able to speak clearly. Also, while deaf people depend on lip movements in order to understand speech only about 40 percent of English is visible on the lips so even the best speech reader misses 60 percent of the words and fills in by contextual clues. It does not help to shout at a deaf person; in fact, with some hearing impairments loud speech is more difficult to understand.
- . Blindness is a visual impairment not a hearing impairment; it does not help to speak louder to a blind person.
- . Mentally retarded people are not "dumb" or "stupid" any more than a child is dumb or stupid. They may take longer to learn or have more limited grasp of language than the "average" person, but a person of 42 with a mental age of 14 thinks like any other 14-year old.

As part of the sensitivity training program, transit system personnel should be given some general guidelines for interacting with handicapped persons. The examples of guidelines, in the form of do's and don'ts are listed below:

- . DO talk directly to the person.
- . DO ask before you offer help. DO listen to the answer and if it includes instructions on how to help follow them as much as policies will allow.
- . DO watch your terminology. Terms to avoid are "victim", "invalid", "deaf and dumb," "cripple", "paraplegic" (unless you are specifying a medical condition), and "patient". Be careful of "senior citizen"; some elderly persons dislike this euphemism though others do not object to it. Also, no one is "wheelchair-confined" or "wheelchair bound". The terms "elderly", "handicapped" and "disabled" are all adjectives not nouns. Therefore, the correct terminology is an elderly person, handicapped passenger, a person who uses a wheelchair, or a wheelchair user.
- . DON'T direct your comments, instead, to an able-bodied companion; that person may be an employee of the handicapped person. This is a common, very demeaning mistake.
- . DON'T be over-solicitous.

Sensitivity training can be conducted by a variety of methods including:

- . Lectures followed by question-and-answer periods;
- . Films, slides, or other audio-visual methods;
- . Role-playing;
- . Reading material such as the transit system's brochure about the accessible service; and
- . Reading material from organizations of disabled persons.

A combination of these techniques produces the most interesting training program. However, the actual techniques utilized is a function of the availability of existing presentations, the personnel being trained and the desired length of the training program. These methods are discussed in this chapter.

6.1.3 Operating Procedures - With the phase-in of accessible buses, some operating procedures and policies must change and new ones must be introduced. Although bus drivers will be the most affected, street supervisors, dispatchers, mechanics, telephone information operators, and community relations and customer assistance staff also need to be trained to various degrees in the new policies and procedures.

These policies and procedures, discussed in Section 4.2.1 in detail, include the following:

- . Passenger assistance,
- . Order of boarding,
- . Restrictions on use of the lift,
- . Use of the kneeling feature,
- . Fare collection,
- . Aides and companions,
- . Priority seating,
- . Safety and emergency procedures,
- . Passenger pass-bys,
- . Testing the equipment, and
- . Complaints and discipline.

The training program should be used to explain these new procedures and obtain feedback from the staff so that serious difficulties can be resolved prior to the start of accessible service. This component of the training program should be conducted in more detail for drivers and street supervisors. Community relations staff and telephone information operators will need only a working knowledge of the procedures. Mechanics need minimal information on operating policies.

Additionally, this element of the training program should define the staff person's general responsibilities for the delivery of accessible service. Specifics are provided for five major categories of transit system personnel.

6.1.3.1 Drivers have constant contact with handicapped passengers. They need a thorough knowledge of policies and procedures concerning boarding and alighting handicapped passengers, fare collection, priority seating, aides and companions, use of the kneeler, use of the public address system (where one exists), and safety and evacuation procedures. Because they are also a primary source of information for the system's users, drivers should be knowledgeable about other accessible buses and lifts in the system, connecting lines, and any interface with other systems or modes.

6.1.3.2 Street Supervisors and Dispatchers need a thorough understanding of all new or changed operating procedures relating to the supervision of accessible service especially in the areas of lift malfunction, schedule adjustments for accessible buses, and emergency and non-emergency evacuation of lift-equipped buses. They need to know under what circumstances minor adjustments should be made to the lifts (such as operating it manually), when to call a road mechanic (depending on job responsibility), and when to call in a replacement bus. Like drivers, supervisors should be trained in the proper method of putting wheelchairs up and down curbs and in procedures for getting wheelchairs off the bus in those situations where the lift is completely inoperable.

Since street supervisors are likely to be the first management personnel on the scene after an accident, they should have some training in assessing damage and the extent or seriousness of personal injuries. They should also be trained in first aid.

6.1.3.3 Mechanics at a minimum, should receive training from the manufacturer of the vehicle and the lift. Included in the lift manufacturer's training should be the schedule for routine maintenance and inspection of the lift and other accessible components as well as procedures for repairing them.

Maintenance policies differ depending on factors such as climate and the number of buses operated. These policies can be expected to change as experience is gained with operating and maintaining the accessibility components. Many systems assign certain mechanics to only lift maintenance duties. Their responsibilities can include cycling the lift every day at pull out or pull in time, developing and implementing monitoring and evaluating procedures, and recordkeeping. The system's own in-house training should reflect these responsibilities.

6.1.3.4 Telephone Information Operators should be well informed of all operating procedures and policies relating to accessible service. They should be aware of the origins and destinations served. If the system interfaces with accessible paratransit service, they should be able to provide transfer and service information for both modes.

Telephone information operators should be instructed to exercise patience with handicapped passengers since many disabilities affect either speech or hearing. They should also be instructed to speak fairly slowly (though not with exaggerated slowness) and at normal volume. Slower speech is easier for anyone to understand; with most hearing impairments, speaking louder does not help.

Many disabled persons are quite inexperienced in the use of public transit. Telephone information operators need to provide basic transit information. They should be prepared to explain boarding and alighting procedures, transferring, schedules, and fares. With respect to accessible service, operators should be able to tell callers what kinds of wheelchairs, if any, will not fit in the securement device; whether the driver can assist them; whether standees are allowed on the lift; and whether the driver will kneel the bus upon request or whether the use of the kneeler is at the driver's discretion. If the system has developed a list of accessible bus stops, operators should advise callers of the accessible stops nearest their origin and destination.

6.1.3.5 Community Relations and Customer Assistance Staff should be advised of the changes in operating policies and procedures related to accessible service so that they can be well informed at public meetings. Besides giving potential passengers information on boarding and alighting, community relations staff, like telephone information operators, should be able to tell them what kinds of wheelchairs, if any, will not fit in the securement devices; whether standees are allowed to use the lift; whether the driver can assist passengers; and whether the driver will kneel the bus upon request or whether kneeling is done only at the driver's discretion. They should also be able to tell disabled passengers how to recognize an accessible bus and whether a certain bus stop is accessible.

The majority of the training for the community relations staff should reflect their responsibility for introducing the service to the public. The staff members' training should make them aware of the special considerations that will be needed for community meetings and demonstrations regarding accessible service. If the transit system is responsible for setting up the meeting, the community relations staff must know how to determine if a meeting site is accessible. At a minimum, the following design standards should be used:

- . The entire path from the parking area to the meeting room should be level or ramped with a slope of 1:12 or less,
- . Doors should have a 32-inch wide clearance, and
- . At least one restroom for men and for women should have a wide stall.

When a meeting is being set up by a community group, it is usually responsible for meeting site arrangements. When a community group is sponsoring a lift demonstration, the transit system's community relations staff should be aware of their needs and inform the group as to the space requirements of a large transit bus and the logistics for a demonstration. A place large enough for the bus to pull in and out without having to turn around or back up is recommended.

6.1.4 Practice Sessions - Concluding the training program with a practice session is strongly recommended. This final component is necessary to develop and retain proficiency in using the accessibility equipment. A driver should learn how to operate the lift, kneeler, securement device, public address system and any other accessibility components while a telephone information operator should practice providing service information to TDD callers and handicapped persons calling on the regular telephone lines. In all cases, the training should distinguish between different mobility aids to the extent that their characteristics affect use of the accessibility equipment (e.g., use of the securement device for different model wheelchairs).

Practice sessions should be conducted in groups. The leader and the size of the group can vary. Some options include:

- . Instructor-Led Groups - An instructor illustrates how the equipment works to a group of about ten people. Each group member is supervised by the instructor on his or her initial practice.
- . Peer-Led Groups - This is similar to the above technique except the group leader is a peer (e.g., another driver) who has already been trained. Peer-led groups can be used effectively at two stages -- for the initial training

of existing drivers and for new driver training and refresher training after service has been implemented.

- . Role-Playing - Two people work together and practice boarding the bus, calling for information, or whatever the new skill is. Each takes a turn as the passenger and the staff person. Frequently, the individual playing the handicapped person's role boards the bus in a wheelchair, wearing ear plugs, or being blindfolded to simulate a mobility-impaired passenger, while the other person plays the role of bus driver. Often, this technique points out where assistance and sensitivity are needed as it will be learned through "first-hand" experience with a variety of mobility aids.
- . Consumer Assistance - One-on-one or small group practice sessions are held with a volunteer from the handicapped community, often a member of the advisory committee. The volunteer demonstrates the role of passenger while the driver practices deploying the lift and using the other equipment. These same volunteers could be asked to call for service information on the TDD or general public telephone number while the operators are being trained.

These four techniques are not mutually exclusive. It is recommended that a program include an instructor-led orientation to the equipment after which the staff is divided into small groups for role-playing. The length of time spent on this element should vary for each individual. At the completion of the role-playing sequence, each person should be asked to demonstrate his or her proficiency to the instructor who will certify the person as properly trained.

It is assumed that most practice sessions will be conducted on the transit system's property. Where time and equipment are available, the drivers assigned to the first accessible routes should be given on-street practice in aligning the bus and deploying the lift and kneeler. This is especially important with rear-door lifts since there are added difficulties involved in maneuvering the bus to the appropriate position. If the transit system intends to review the accessibility of the bus stops along the first routes, this and the driver's on-street practice could be conducted simultaneously.

6.2 Training Program Presentation Methods

The contents of the training program, discussed in the previous section, can be presented to the transit system's personnel through a variety of methods. These include:

- . Lectures,
- . Audio-visual presentations,
- . Demonstrations and "hands-on" use of the equipment, and
- . Outside reading.

A combination of these four techniques is recommended for all personnel. Each is discussed below as a separate subsection.

6.2.1 Lectures should be used for presenting brief explanations of procedural and policy changes. A lecture could be used for introducing sensitivity training concepts, too. A handicapped person, perhaps an advisory committee member, could follow up this lecture with an address to the group on sensitivity issues.

The primary drawback to lectures is that attendees may become bored and inattentive if the lecture is too long. Combining a lecture with a question-and-answer session is one technique for holding the attention of the audience. It also tends to increase comprehension and retention of the materials more than a straight lecture.

6.2.2 Audio-Visual Presentations, whether films or slides, are very effective training aides. The person can see the operation being performed or the equipment being described while listening to the accompanying narration. The film, "The New Mobility," produced by the Southern California Rapid Transit District, and the slide presentation produced by Bi-State Development Agency in St. Louis, are two examples of audio-visual presentations that have been used by a number of transit systems for both sensitivity training and equipment training. A list of several transit systems who have developed training materials which others can borrow is presented in Exhibit 6-1. Since the films are prepared using the transit system's own accessible buses, one column of the exhibit lists the bus and lift shown.

EXHIBIT 6-1
SELECTED TRANSIT SYSTEM SOURCES
FOR TRAINING MATERIALS

Training Material	Transit System Source	Type of Equipment Illustrated
"The New Mobility" – film and accompanying brochure	Southern California Rapid Transit District 425 South Main Street Los Angeles, CA 90013	American Motors "New Look" with TDT Lift
"Accessible Bus: Guidelines for Operators"	Office of Financial & Planning Policy Washington Metropolitan Area Transit Authority (WMATA) 600 5th Street, N.W. Washington, DC 20001	Flxible "New Look" with Vapor Lift
"Getting to Know You" – film		
Instructor's Manual		
Booklet on common disabling conditions		
Classroom teaching charts		
Barrier awareness booklets		
Instructor's Manual	Instruction Department Seattle Metro Transit Exchange Building 821 2nd Avenue Seattle, WA 98104	Flyer with Lift-U Lift
Videotape		
"Riding Together" – film	Research and Planning Department (film)	Flyer with Vapor Lift
Slides of operation	Training Department (slides) AC Transit 508 16th Street Oakland, CA 94612	
Empathy Training – program overview and instructor's manual	Training Department Orange County Transit District P. O. Box 3005 11222 Acacia Parkway Garden Grove, CA 92642	None
Slide/tape presentation and script for sensitivity program	Champaign-Urbana Mass Transit District 801 E. University Avenue Urbana, IL 61801	Grumman with EEC Lift

Other films and materials can be obtained from rehabilitation centers and film libraries. Some of these, listed in Exhibit 6-2, are related to transit accessibility; others focus on building and employment accessibility. Nonetheless, they may be usable for sensitivity training. The ones prepared by Moss Rehabilitation Hospital and George Washington University's Rehabilitation Research and Training Center were developed in conjunction with the local transit system for driver training programs.

Another audio-visual technique which can be utilized is an overhead projector and vu-graphs. If the transit system has ready access to this equipment, it can be an inexpensive method for presenting operational information to the group prior to the demonstration of procedures and equipment.

6.2.3 Demonstrations and "Hands-On" Use of the Equipment are essential techniques for training programs. Demonstrations should simulate actual operating conditions. For instance, the lift should be operated with a person in a wheelchair on it.

Though audio-visual materials may show how the accessibility equipment operates, it is recommended that a "live" demonstration also be included immediately preceding the practice sessions. "Hands-on" operation of the lift and other accessibility components is the most important aspect of the training program. Regardless of how many times the drivers have read how to use the equipment or seen others use it in a film or in person, the skills will not be mastered until they have operated the equipment themselves and become familiar with its handling. Techniques for conducting demonstrations and "hands-on" practice sessions were discussed previously in Section 6.1.4.

6.2.4 Outside Reading includes materials describing the operation of the accessibility equipment, in-house manuals, and informational brochures from agencies relevant to sensitivity training and the needs of handicapped passengers. This information should be made available for voluntary reading in places such as the driver's day room. Material should also include the marketing brochures that the system is distributing to the public. Reading material is especially useful for providing additional information to that presented in lectures or by other means. The major drawback is that it is very difficult to ensure that the material is actually read.

EXHIBIT 6-2
SELECTED SOURCES FOR SENSITIVITY TRAINING MATERIALS

<u>Title and Description</u>	<u>Media</u>	<u>Source</u>
<p>“You Can Open the Door”</p> <p>“Special People”</p> <ul style="list-style-type: none"> . discusses disabilities of ambulatory handicapped . presented from the transit driver’s viewpoint 	<p>Slide/Tape Presentations</p>	<p>Moss Rehabilitation Hospital 12th Street & Tabor Road Philadelphia, PA 19141</p>
<p>“Walk a Mile in My Shoes”</p> <ul style="list-style-type: none"> . follows severely disabled people as they travel on buses, planes, and trains . presents their perspectives on barriers 	<p>Film</p>	<p>National Film Board of Canada 1251 Avenue of the Americas, 16th Floor New York, NY 10020</p>
<p>“Getting to Know You”</p> <ul style="list-style-type: none"> . roundtable discussion with various handicapped individuals . discusses problems and how they wish to be treated 	<p>Videotape</p>	<p>Transportation Project Rehabilitation, Research and Training Center 1828 L Street, N.W., Suite 704 Washington, DC 20036</p>
<p>“Accessible Bus: Guidelines for Operators”</p> <ul style="list-style-type: none"> . offers do’s and don’ts for boarding, alighting, and securement . presented in “Keystone Cops” comical style 	<p>Videotape</p>	
<p>Other Training Materials used by WMATA</p>	<p>Various</p>	
<p>‘A Different Approach’</p> <ul style="list-style-type: none"> . employment-oriented . discusses how people with various handicaps can work effectively 	<p>16mm Film and Video Cassette</p>	<p>Handicapped Learning Materials Distributing Center Indiana University Bloomington, IN 47405</p>

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EXHIBIT 6-2
SELECTED SOURCES FOR SENSITIVITY TRAINING MATERIALS
 (Continued)

Title and Description	Media	Source
"Mobility for Everyone – An Inherent Right" . early film advocating accessible transit . interviews handicapped persons about their transportation needs	Color, Sound Film 22 Minutes	Rehabilitation Education Center University of Illinois Champaign, IL 61820
"The Surest Test of a Civilization" . follows a woman in a wheelchair through a typical day . focuses on architectural barriers	Color, Sound Film 10 Minutes	Washington Easter Seal Society for Crippled Children and Adults Seattle, Washington
"Sound the Trumpets" . discusses physical barriers to employment . based on a job interview	Color, Sound Film 22 Minutes	International Rehabilitation Film Review Library 20 West 40th Street New York, New York
New film to be released in early 1983 . describes types of accessible bus service . explains concepts and how to use the bus	Color, Sound Film	Cinetel Film Productions, Ltd. 1102 Walnut Street Philadelphia, PA 19107

A number of training materials and resources are available to transit systems including materials from the U.S. Department of Transportation and other federal agencies, other transit systems, organizations of handicapped or elderly persons, and social service organizations.

Some transit systems have developed extensive training tools which other agencies may borrow, including slide programs, films, brochures and complete lecture notes. A list of these systems and their materials was presented as Exhibit 6-1.

The assistance of disabled consumers is essential in developing an effective training program. Organizations of handicapped persons are valuable resources for developing sensitivity training programs. Many organizations have materials available for use. Among the national organizations that may prove especially helpful are the American Coalition of Citizens with Disabilities, National Federation of the Blind, American Council of the Blind, and National Association of the Deaf. State and local organizations of handicapped persons and chapters of these should be contacted in the local area.

Some consumer groups, listed in Exhibit 6-3 also have useful materials. Especially useful are materials from United Cerebral Palsy and Easter Seal Society. Also helpful in the area of hidden handicaps are brochures from various organizations such as the Epilepsy Society, Muscular Dystrophy Association, and Multiple Sclerosis Foundation. Another resource is the National Center for a Barrier Free Environment, a coalition group that publishes information on access and aids in coordinating access efforts. Addresses for these consumer groups are provided as Exhibit 6-3. This list is not exhaustive but is recommended as a starting point for collecting information.

6.3 Training Program Schedule

Many things affect the schedule for training, including the size of the transit system, the percentage of buses that are accessible, the number of garages to which accessible buses are assigned, and the availability of instructors. Recognizing these considerations, this section provides guidelines for developing a training program schedule. This includes when in the process the program is conducted, how long each element should take, and how often the program should be repeated. There are three distinct steps in the training program -- initial training before service begins, refresher training, and training for new employees.

EXHIBIT 6-3

SELECTED DISABLED CONSUMER GROUPS^(a)

American Coalition of Citizens
with Disabilities
1200 15th St., N.W., Suite 201
Washington, DC 20005

National Paraplegia Foundation
National League of Cities
1620 I Street, N.W.
Washington, DC 20006

Architectural & Transportation Barriers
Compliance Board
330 C St., S.W., Room 1010
Washington, DC 20201

Paralyzed Veterans of America
4330 East-West Hwy., Suite 300
Washington, DC 20014

Center for Independent Living
2539 Telegraph Rd.
Berkeley, CA 94704

National Center for Law
and the Handicapped
1235 N. Eddy St.
South Bend, IN 46617

California Association
of the Physically Handicapped
P.O. Box 22552
Sacramento, CA 95822

National Center
for a Barrier Free Environment
1140 Connecticut Ave., N.W., Suite 1006
Washington, DC 20036

Disability Rights Center
1346 Connecticut Ave., N.W., Suite 1124
Washington, DC 20036

Public Interest Law Center of Philadelphia
1315 Walnut St., 16th Floor
Philadelphia, PA 19107

United Cerebral Palsy
663 34th St.
New York, NY 10004

National Federation of the Blind
1629 K St., N.W.
Washington, DC 20006

American Council of the Blind
1211 Connecticut Ave., N.W.
Washington, DC 20036

League of Disabled Voters
P.O. Box 23283
L'Enfant Plaza Station, S.W.
Washington, DC 20024

(a) This list is not exhaustive. Some organizations are national, some are state, and some are local. Local affiliates or chapters of national or state organizations can often be contacted through the national or state office.

EXHIBIT 6-3
SELECTED DISABLED CONSUMER GROUPS^(a)
(Continued)

Paraquad
4397 Laclede Ave.
St. Louis, MO 63108

Washington Coalition of Citizens
with Disabilities
2366 Eastlake, N.E., Room 432
Seattle, WA 98102

New York State Coalition of Persons
with Disabilities
237 Roosevelt Ave.
Syracuse, NY 13210

Disabled in Action of New York
175 Willoughby St., No. 11H
Brooklyn, NY 11201

Disabled in Action of Pennsylvania
1319 McKinley St.
Philadelphia, PA 19111

National Association of the Deaf
814 Thayer Ave.
Silver Springs, MD 20910

United Cerebral Palsy
425 "I" St., N.W., Suite 141
Washington, DC 20001

United Cerebral Palsy Association
of San Francisco
814 Mission St.
San Francisco, CA 94103

American Association of Retired Persons
1909 K St., N.W.
Washington, DC 20006

Grey Panthers
3635 Chestnut St.
Philadelphia, PA 19104

National Association for Retarded Citizens
1522 K St., N.W.
Washington, DC 20005

National Congress of Organizations
of Physically Handicapped
1627 Deborah Ave.
Rockford, IL 61103

(a) *This list is not exhaustive. Some organizations are national, some are state, and some are local. Local affiliates or chapters of national or state organizations can often be contacted through the national or state office.*

6.3.1 Initial Training Prior to Service Initiation - All transit personnel should be trained before accessible service is operating. Training should begin approximately three months prior to the first operating day. The actual timing would depend on the delivery of the buses as their arrival is intrinsic to developing materials and conducting practice sessions.

Program Length - The complete training program should take between 3 and 4 1/2 hours. The time should be divided into the following sections:

- . Use of Accessibility Equipment - 1 hour to 1 1/2 hours, depending on the extent of the question and answer period;
- . Sensitivity Training - 1 hour if only a lecture, 1 1/2 hours if audio-visual materials or special presentations are included;
- . Operating Procedures - 1/2 hour, though it may be possible to combine this with the initial lecture; and
- . Practice Sessions - 1/2 hour as part of a group demonstration plus 1/2 hour for individual practice.

Supervisors and dispatchers should be the first individuals trained prior to the beginning of accessible service. If supervisors are to instruct the drivers, they should receive their training far enough in advance of driver training to be comfortable with the teaching role.

A core of drivers should be trained in the use of the accessibility equipment before the service is offered. At a minimum, it is recommended that initial training include the drivers who will be assigned to the accessible runs as well as the extra board drivers.

Mechanics should be trained in the maintenance and repair of any new features of the bus, including the accessibility equipment. If possible, factory training should be provided prior to the receipt of the new buses. If the vehicle and lift are made by two different manufacturers, it is highly advisable for the mechanics to be trained by both manufacturers; the vehicle manufacturer's training in the maintenance

and repair of the lift may not be sufficient. It is recommended that at least one mechanic be trained by the manufacturers. This mechanic can conduct a program for the rest of the maintenance staff.

Telephone information operators should receive their training in equipment use and sensitivity approximately three to six months before the start of service. In this manner they will be able to respond to telephone requests for service information as people become aware of the arrival of accessible buses.

Community relations and customer assistance staff should also be trained approximately three to six months before accessible service begins. They need to be informed should a question on accessible service be raised at a community meeting. Additionally, they will conduct and attend user training sessions and public demonstrations in the weeks that precede the start of accessible service.

6.3.2 Refresher Training - The experience of the transit systems operating accessible service indicates that many lift malfunctions are a result of driver error. Even when a driver has developed an initial proficiency in using the equipment, he or she can forget these skills if the lifts are not used frequently. The purpose of a refresher training program is to provide the opportunity to use these skills. While some systems require the driver to cycle the lift and kneeler at pull-out or pull-in time, a refresher training program goes beyond this. At approximately three month intervals, coinciding with the drivers "picking" their runs, those assigned to accessible runs are given a brief (15 minutes), individualized review of the use of the accessibility equipment. These reviews are given by either another driver or supervisor. It is recommended that these individual practice sessions supplement required cycling practices and voluntary practice sessions.

Refresher training for sensitivity and operating procedures could be accomplished with memoranda to staff and bulletin board notices which serve as reminders of the policies and special considerations which handicapped passengers may require. Seminars and small group discussions for all personnel should be considered. These sessions serve to reinforce the concepts of sensitivity as well as discuss how the policies and procedures are working.

6.3.3 New Employee Training - New employee training for any job classification should include instruction in the appropriate areas of accessible service. The curriculum should be revised to incorporate accessible service features at the appropriate places in the existing program, rather than appending a special section.

* * * * *

A training program for accessible service should consist of four distinct elements:

- . Use of the accessibility equipment,
- . Sensitivity,
- . Operating procedures, and
- . Practice sessions.

The last element is particularly emphasized to guarantee "hands-on" experience with the new equipment. Transit systems should make provisions for ongoing practice opportunities and establish refresher training sessions.

Prior to service initiation, some of the drivers should be trained. At a minimum, it is recommended that this include all drivers assigned to accessible runs, as well as the extra board drivers. All other system personnel, such as street supervisors, dispatchers, mechanics, telephone information operators, and public relations staff, should be trained before service begins.

In addition to guidance on training program contents and schedules, this chapter provided a directory of training programs already developed by transit, federal, and social service agencies. It also provided addresses for a number of disabled consumer groups who can provide information that can be used in the preparation of a training program.

CHAPTER 7 MARKETING

Providing information on accessible service to handicapped persons, current riders, and the general public is a key aspect of phasing-in accessible buses. The type of information that the handicapped person needs is different from that needed by current riders. The handicapped passenger most likely is new to the transit system and needs a basic orientation to transit. Current riders need to know how the new service might impact their trip. The general public needs an overview of the service - - more of an introductory announcement.

The marketing program for accessible service should have three objectives:

- Attract handicapped persons to ride the bus,
- Make the public aware that the service exists, and
- Explain how the service operates.

To accomplish these objectives, the transit system should modify its current marketing practices. For handicapped passengers, a brochure should be developed and distributed. This brochure should include a map of the accessible routes. Timetables for the accessible routes should be revised and reprinted. User training sessions should be conducted. Press releases to agency newsletters should be issued. These activities constitute the basic marketing program recommended for accessible service.

In addition to these efforts, a number of activities are recommended for informing current riders and the general public about the new service. These include brochures distributed on-board the buses, paid advertisements, and community presentations. All contribute to disseminating information about accessible service and enhancing the transit system's public image.

This chapter is organized into three sections -- Information for Handicapped Passengers, Current Riders and the General Public. These sections discuss specific marketing tools for each group.

7.1 Information for Handicapped Passengers

The information for handicapped passengers should be prepared to provide an orientation to transit service - - e.g., explain what the fare is, where to board the bus, how to read the destination signs, how to transfer, and how to obtain service information. If the system has a "riders guide" for new passengers, it should be distributed along with the accessible service material. Otherwise, more descriptive information should be included in accessible service brochures.

The five activities that are recommended for reaching the handicapped community include brochures, timetables, maps, user training sessions, and press releases.

A packet of information for new handicapped riders should be prepared which includes a brochure, a set of timetables, a route map, and a system guide where one exists. This packet should be distributed to existing transit system information centers. However, because the material is tailored for a target market, additional distribution procedures are recommended. This information should be distributed to organizations of handicapped persons, social service agencies, rehabilitation and independent living centers, and other locations which the handicapped population is known to visit.

7.1.1 Brochures - Many transit systems have developed special brochures which illustrate how the lift and securement device operate. The brochures often include a series of photographs showing the various steps in boarding the bus. Several examples are shown as Exhibit 7-1.

More elaborate multi-page brochures contain more detailed instructions and ridership information, "sensitivity" material, and explanations about what can go wrong. For example, the brochure prepared by the Southern California Rapid Transit District (SCRTD) includes the following as a preface to the boarding instructions:

"It is possible that some people will have difficulty boarding the lift-equipped buses, especially on the first few trips. That's why we recommend that you take someone along with you the first few times. We also suggest you attend one of the demonstration/training community meetings we are sponsoring . . ."

The Southeastern Pennsylvania Transportation Authority (SEPTA) subtitled their brochure as a "Common Sense Guide."

EXHIBIT 7-1
SAMPLE BROCHURES FOR ACCESSIBLE SERVICE

how to ride the
**WHEELCHAIR
LIFT BUS**

A new way to
help you get around

3010



10 Wells Wisconsin

WHEELCHAIR LIFT BUSES

HOW TO RIDE

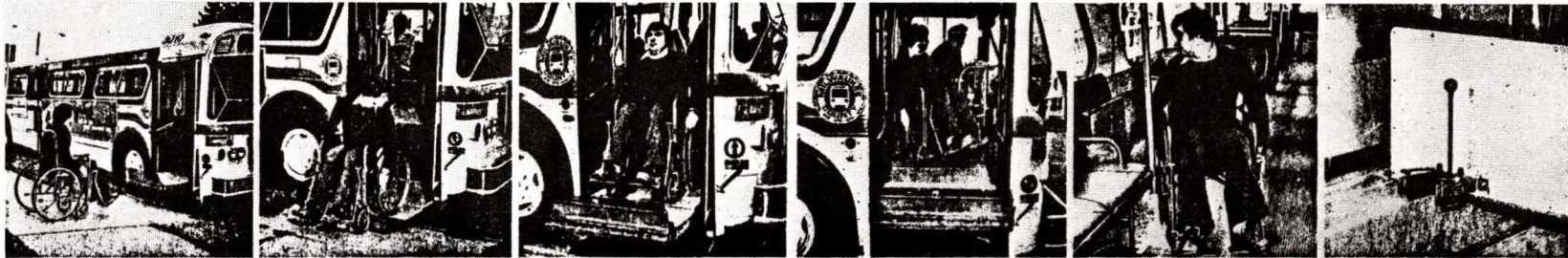


THE BIG BLUE
WHEELCHAIR
LIFT BUSES

SANTA MONICA
MUNICIPAL BUS LINES
451-5445

**EXHIBIT 7-1
SAMPLE BROCHURES FOR ACCESSIBLE SERVICE
(CONTINUED)**

HOW TO GET ON A LIFT-EQUIPPED BUS



1. When the bus arrives, remain at least five feet from the front door, allow other passengers to get on or off, and wait for the lift to be lowered.

2. The driver will tell you when the lift is ready for you to board. Please board the lift **BACKWARDS** and move as far back as possible.

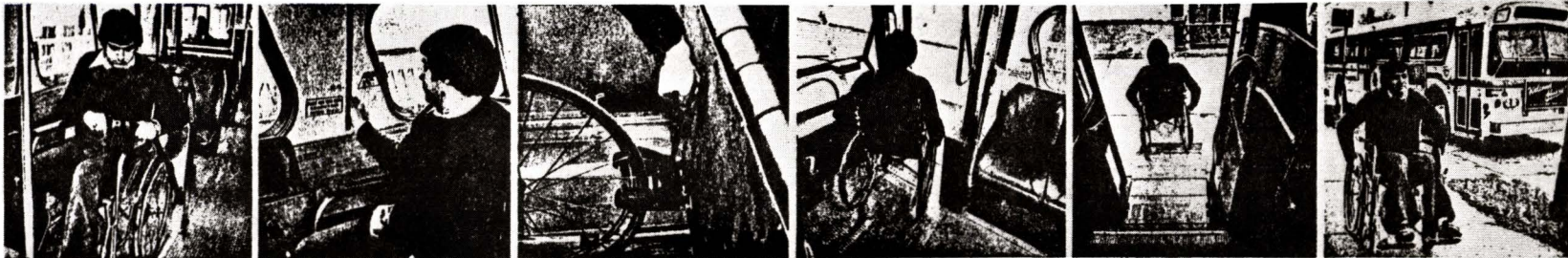
3. Lock your wheels. A safety barrier will be raised and the lift will be elevated to the level of the bus floor.

4. The driver will instruct you to enter the bus when the lift has stopped at the proper level. When you enter the bus deposit your fare, and tell the driver where you wish to get off.

5. Move backward toward the securement area as indicated by the driver.

6. Maneuver your wheelchair into the safety locking device which will firmly clamp to your right wheel.

HOW TO GET OFF THE LIFT BUS



7. Lock your wheelchair brakes, and fasten the safety belt (the driver may assist you if necessary).

1. Adjacent to the securement area is a yellow signal strip. Push the strip to alert the driver that you wish to get off at the next bus stop.

2. When the bus comes to a complete stop, unfasten the safety belt, and unlock the securement device by pushing down on the knob near your right wheel. Unlock your wheels. Please wait for all other passengers to get on or off.

3. Move to the front of the bus. When the driver indicates that the lift is ready to board, move onto the lift facing out, and lock your wheels.

4. When the lift is at ground or curb level and the safety barrier is lowered, unlock your wheels and move completely off the lift.

**YOUR BUS TRIP
HAS BEEN
COMPLETED!**

**NEED MORE
INFORMATION?**

**CALL
344-6711**

EXHIBIT 7-1
SAMPLE BROCHURES FOR ACCESSIBLE SERVICE
(CONTINUED)



SANTA CLARA COUNTY TRANSIT DISTRICT BROCHURE

EXHIBIT 7-1
SAMPLE BROCHURES FOR ACCESSIBLE SERVICE
(CONTINUED)

Buses Which Serve Both:

Able bodied and
physically limited people.

Boarding Steps Unfold To Become A Passenger Lift

Persons who can't climb steps are lifted aboard the bus in a matter of seconds.

It Is Safe And Simple To Use



Accessible Buses Will Take You Where You Want To Go:

Banks
BART
County Offices
City Offices
De Anza College

Doctors
San Jose Airport
Social Security Offices
and many more

Within the next few years every bus in Santa Clara County will be equipped with a passenger lift, making County Transit more accessible to physically limited passengers.

Because of the wide range of services which they reach, Lines 18 and 64 are now assigned this equipment. As additional coaches with passenger lifts become available this spring, they will be assigned to Lines 66 and then to 62.

Demonstrations in the use of the lift are now being scheduled. Call County Transit Customer Services for details and come see if you can use the lift independently or if you will need someone to accompany you to help you aboard. Phone 299-4141

 **County Transit**



SANTA CLARA COUNTY BROCHURE – CONTINUED

One section entitled "Can Anything Go Wrong with My Ride?" alerts the potential passenger to the following barriers that may make bus service "something less than accessible:"

Street Problems

Illegally parked cars often prevent buses from stopping at transit signs, or from getting close to curbs. If the bus can't pull over and a high curb or lack of curb-cut presents an impasse, there's nothing the bus operator can do.

Detours

Street construction or police and fire emergencies can cause temporary rerouting of the bus you're waiting for. SEPTA does its best to spread the word but radio stations usually don't have time to recite detailed detour information. Your best bet is to listen to the radio for quick notice of problems which you can then avoid. A more difficult problem would be if a bus you're already riding is forced to detour taking you blocks from your destination. It's always best to have an emergency back-up in mind - - someone you can contact for alternate transportation.

Mechanical Failure

Like any other machine, wheelchair lifts can break down. It is possible this can happen while a bus is in service and you're on board. If it does, the operator will summon special assistance to evacuate you and your chair.

Crowding

During peak hours, or when service is running late and buses are crowded, it might not be possible for a wheelchair user to board.

The Human Element

There could be times when persons using the seats that must be folded up to make room for wheelchairs will refuse to move. If this happens - - or if other barriers listed above exist - - the SEPTA operator is instructed to offer apologies and ask you to wait for the next available bus.

The intent of these explanations is not to discourage users but rather to alert them to some of the pitfalls that may occur in actual operations.

If both fixed-route and paratransit accessible service are offered, it may be more appropriate to develop a single, comprehensive guide to transportation service for handicapped persons. At a minimum, the brochure for fixed-route accessible service should mention the availability of any paratransit feeder service, instructions for requesting it, and transfer procedures.

7.1.2 Timetables - Public timetables for the accessible routes should be modified to clearly indicate that the route is accessible and to designate the trips which are scheduled to operate with accessible buses. Most systems use the international symbol for accessibility on the cover. The symbol should be located so that it is visible when displayed on a schedule rack. Examples of timetable covers are shown in Exhibit 7-2.

If the route is partially accessible, the trips which are operated with lift-equipped buses should be indicated on the timetable. This can be done in a variety of ways. Options which have been used include listing the arrival time in bold type, placing a star or square next to the line in the schedule, or placing a letter such as "L" for lift next to the line. Examples of both partially and fully accessible route timetables are shown in Exhibit 7-3.

The timetables also should reference a list of accessible stops along each of the phased-in routes. Those that are accessible; i.e., there is adequate room to deploy the lift, should be identified with the international symbol for accessibility. If a system posts the symbol at all stops along the route without checking for their accessibility, this policy should be clarified. Accordingly, a paragraph could be added to the timetable describing where to board an accessible bus. If transfers between accessible modes are possible, a paragraph on the timetable should also explain this.

7.1.3 Maps - During the phase-in process, a map of the first routes to be made accessible should also be prepared and either inserted in the brochure or appended to a set of timetables. (Exhibit 7-4 shows such a map for an early phase of service in Los Angeles). As more routes are gradually placed in service, the map should be updated. If the system has a mixed fleet of accessible buses, the map should illustrate the routes in a way that indicates which kinds of buses operate along them (e.g., front door lift or rear door lift).

EXHIBIT 7-2
TIMETABLE COVERS DENOTING ACCESSIBLE SERVICE

EFFECTIVE FEBRUARY 18, 1980
SUBJECT TO CHANGE WITHOUT NOTICE

 **LINE**

88

88 SAN DIEGO FREEWAY EXPRESS (VAN NUYS, UCLA, WESTWOOD)

ALSO SERVING WESTCHESTER, L.A. INTERNATIONAL AIRPORT, PACOIMA, SEPULVEDA, LAKEVIEW TERRACE

RTD Southern California Rapid Transit District
24 HOUR Transit Information
English—Español
(213)826-4455—(213)273-0910
(213)781-5890—(213)973-1222
For the Hearing Impaired, call:
TTY(800)252-9040


Los Angeles

bus schedule

July 1, 1980

route 3

SERVES:
MISSION HILLS
VIA DOWNTOWN
AND
OCEAN VIEW BOULEVARD
HILLCREST
LOGAN HEIGHTS
WITH EXTENDED SERVICE TO PACIFIC HWY

 PROVIDES WHEELCHAIR LIFT SERVICE.

San Diego

8  Timetable

**N. 19th Avenue
W. Cactus**



Effective 8/31/81

**City of Phoenix
Transit System**
257-8426

Phoenix

EXHIBIT 7-3
TIMETABLES SHOWING ACCESSIBLE TRIPS

Route Serving
55 Admiral District,
West Seattle Junction,
Downtown Seattle

WEEKDAY READ ACROSS →

Admiral District	West Seattle Junction		Downtown Seattle			
California Ave SW & SW Alaska St	California Ave SW & SW Admiral Way	Routes Connecting to route 55	California Ave SW & SW Alaska St	35th Ave SW & SW Avonlea Way	2nd Ave & Pike St	7th Ave & Westlake
L 4:37	5:49	49NS	5:56	5:59	6:10	6:20-G
L 4:02	5:04	—	5:11	5:14	5:25	—
L 5:17	6:19	49NS	6:23	6:29	6:40	6:50-G
L 4:28	5:30	37	6:37	6:40	6:50	6:55-G
L 4:38	5:41	—	6:48	6:51	7:04	7:09-G
L 3:46	5:51	49NS	6:59	7:02	7:15	7:20-G
L 5:57	7:00	37	7:08	7:11	7:25	—
L 7:06	7:09	49NS	7:17	7:20	7:34	7:38-G
L 7:16	7:19	—	7:27	7:30	7:44	7:48-G
L 7:22	7:25	37	7:33	7:36	7:50	7:56-G
L 7:41	7:44	49N	7:52	7:56	8:10	8:15-G
L 7:52	7:55	37	8:03	8:07	8:21	8:26-G
L 8:05	8:08	49N	8:16	8:20	8:33	8:38-G
L 8:10	8:13	49NS	8:21	8:25	8:38	8:44-G
L 8:23	8:28	17	8:34	8:38	8:51	8:57-G
L 8:41	8:44	49NS	8:52	8:56	9:09	9:15-G
L 9:01	9:04	—	9:12	9:16	9:29	9:35-G
L 9:22	9:25	49NS	9:32	9:36	9:49	9:55-G
L 9:42	9:45	—	9:52	9:56	10:09	10:15-G
L 10:02	10:05	49NS	10:12	10:16	10:29	10:35-G
L 10:22	10:25	—	10:32	10:36	10:49	10:55-G
L 10:42	10:45	49NS	10:52	10:56	11:09	11:15-G
L 11:02	11:05	—	11:12	11:16	11:29	11:35-G
L 11:22	11:25	49NS	11:32	11:36	11:49	11:55-G
L 11:42	11:45	—	11:52	11:56	12:09	12:15-G
L 12:02	12:05	49NS	12:12	12:16	12:29	12:35-G
L 12:22	12:25	—	12:32	12:36	12:49	12:55-G
L 12:42	12:45	49NS	12:52	12:56	1:09	1:15-G
L 1:02	1:05	—	1:12	1:16	1:29	1:35-G
L 1:22	1:25	49NS	1:32	1:36	1:49	1:55-G
L 1:42	1:45	—	1:52	1:56	2:09	2:15-G
L 2:02	2:05	49NS	2:12	2:16	2:29	2:35-G
L 2:22	2:25	—	2:32	2:36	2:49	2:55-G
L 2:42	2:45	49NS	2:52	2:56	3:09	3:15-G
L 3:02	3:05	—	3:12	3:16	3:29	3:35-G
L 3:22	3:25	49NS	3:32	3:36	3:49	3:55-G
L 3:41	3:44	—	3:51	3:55	4:08	4:15-G
L 3:58	3:58	49NS	4:06	4:10	4:23	4:30-G
L 4:12	4:15	—	4:23	4:27	4:40	4:47-G
L 4:37	4:40	49NS	4:48	4:52	5:06	5:11-G
L 4:52	4:58	49NS	5:03	5:07	5:20	5:28-G
L 5:04	5:07	—	5:15	5:19	5:32	5:38-G
L 5:17	5:20	37	5:28	5:32	5:46	5:51-G
L 5:38	5:41	49NS	5:49	5:53	6:08	6:12-G
L 5:58	5:58	—	6:06	6:10	6:20	6:26-G
L 6:11	6:14	49NS	6:21	6:25	6:38	6:41-G
L 6:28	6:29	—	6:36	6:40	6:50	6:56-G
L 6:48	6:51	49N	6:58	7:00	7:10	7:20-G
L 7:19	7:21	49S	7:28	7:30	7:40	7:50-G
L 7:48	7:51	49N	7:58	8:00	8:10	8:20-G
L 8:19	8:21	49S	8:28	8:30	8:40	8:50-G
L 8:49	8:51	49N	8:58	9:00	9:10	9:20-G
L 9:19	9:21	49S	9:28	9:30	9:40	9:50-G
L 9:49	9:51	49N	9:58	10:00	10:10	10:20-G
L 10:19	10:21	49S	10:28	10:30	10:40	10:50-G
L 10:49	10:51	49N	10:58	11:00	11:10	11:20-G
L 11:49	11:51	49N	11:58	12:00	12:10	12:20-G
L 12:49	12:51	49N	12:58	1:00	1:10	1:20-G

AM — Lighter Type
PM — Darker Type

WEEKDAY READ ACROSS →

Downtown Seattle		West Seattle Junction		Admiral District		
5th Ave & Pike St	1st Ave & Pike St	35th Ave SW & SW Avonlea Way	California Ave SW & SW Alaska St	Transfer Connection with route:	California Ave SW & SW Admiral Way	California Ave SW & SW Alaska St
L 5:07	5:15	5:25	5:30	—	5:37	5:40
L 6:34	6:38	6:49	6:53	37	7:00	7:03
L 5:55	7:00	7:14	7:18	49NS	7:25	7:29
L 7:05	7:10	7:24	7:28	—	7:36	7:39
L 7:16	7:21	7:35	7:39	—	7:47	7:50
L 7:27	7:32	7:46	7:50	49NS	7:58	8:01
L 7:40	7:45	7:59	8:04	—	8:12	8:15
L 7:52	7:57	8:11	8:15	49NS	8:24	8:27
L 8:11	8:16	8:30	8:35	—	8:43	8:46
L 8:28	8:31	8:45	8:50	49NS	8:58	9:01
L 8:41	8:46	8:59	9:04	—	9:10	9:14
L 9:05	9:10	9:23	9:28	49NS	9:35	9:38
L 9:18	9:23	9:36	9:41	—	9:48	9:51
L 9:45	9:50	10:03	10:08	49NS	10:15	10:19
L 10:05	10:10	10:23	10:28	—	10:35	10:38
L 10:25	10:30	10:43	10:48	49NS	10:55	10:58
L 10:45	10:50	11:03	11:08	—	11:15	11:18
L 11:05	11:10	11:23	11:28	49NS	11:35	11:38
L 11:25	11:30	11:43	11:48	—	11:55	11:58
L 11:45	11:50	12:03	12:08	49NS	12:15	12:18
L 12:05	12:10	12:24	12:29	—	12:36	12:39
L 12:25	12:30	12:44	12:49	49NS	12:56	12:59
L 12:45	12:50	1:04	1:09	—	1:16	1:19
L 1:08	1:10	1:24	1:29	49NS	1:36	1:39
L 1:25	1:30	1:44	1:49	—	1:56	1:59
L 1:45	1:50	2:04	2:09	49NS	2:16	2:19
L 2:05	2:10	2:25	2:30	—	2:37	2:40
L 2:25	2:30	2:45	2:50	49NS	2:57	3:00
L 2:45	2:50	3:05	3:10	—	3:18	3:21
L 3:05	3:10	3:25	3:30	49NS	3:38	3:41
L 3:25	3:31	3:46	3:51	—	3:59	4:02
L 3:45	3:50	4:05	4:10	—	4:18	4:21
L 4:00	4:08	4:24	4:29	49NS	4:37	4:40
L 4:05	4:10	4:26	4:34	—	4:42	4:46
L 4:15	4:20	4:36	4:44	—	4:52	4:55
L 4:25	4:30	4:46	4:54	49NS	5:02	5:05
L 4:28	4:30	4:48	4:54	49NS	5:02	5:05
L 4:38	4:40	4:58	5:04	49NS	5:12	5:15
L 4:40	4:45	5:04	5:09	—	5:17	5:20
L 4:50	4:58	5:12	5:19	—	5:27	5:30
L 4:58	5:04	5:22	5:29	—	5:38	5:39
L 5:05	5:10	5:28	5:34	49NS	5:42	5:46
L 5:17	5:22	5:40	5:46	49S	5:54	5:58
L 5:30	5:35	5:52	5:57	49NS	6:05	6:08
L 5:51	5:56	6:11	6:18	49NS	6:23	6:26
L 6:11	6:15	6:27	6:32	—	6:39	6:42
L 6:41	6:45	6:57	7:00	49NS	7:07	7:10
L 7:08	7:15	7:27	7:30	49S	7:38	7:38
L 7:37	7:45	7:57	8:00	49N	8:08	8:08
L 8:07	8:15	8:27	8:30	49S	8:38	8:38
L 8:37	8:45	8:57	9:00	49N	9:08	9:08
L 9:07	9:15	9:27	9:30	49S	9:38	9:38
L 9:37	9:45	9:57	10:00	49N	10:08	10:08
L 10:07	10:15	10:27	10:30	49S	10:38	10:38
L 10:37	10:45	10:57	11:00	49N	11:08	11:08
L 11:07	11:15	11:27	11:30	49S	11:38	11:38
L 12:07	12:15	12:27	12:30	49S	12:38	12:38
L 12:49	12:55	1:07	1:10	49S	1:28	1:28

AM — Lighter Type
PM — Darker Type

L - Lift Equipped Vehicle

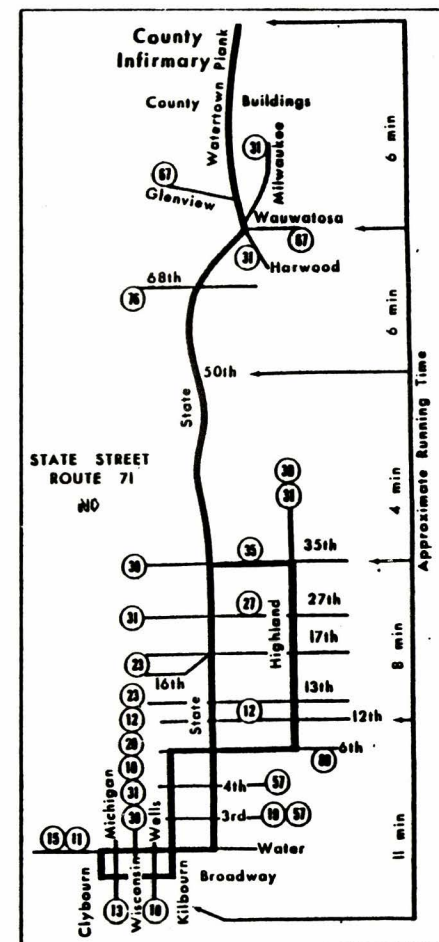
EXHIBIT 7-3 TIMETABLES SHOWING ACCESSIBLE TRIPS (CONTINUED)

EASTBOUND

LEAVING FOR DOWNTOWN MILWAUKEE--N. BROADWAY & E. CLYBOURN STS.

WEEKDAYS						SATURDAYS						SUN. & HOL.		
County Infirmary	State & Harw.	35th & State	County Infirmary	State & Harw.	35th & State	County Infirmary	State & Harw.	35th & State	County Infirmary	State & Harw.	35th & State	County Infirmary	State & Harw.	35th & State
A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	A.M.	A.M.	A.M.
C4.55	4.59	5.08	W3.02	3.11	3.20	C5.36H	5.39H	5.22H	6.52H	5.57H	6.05H	C5.40H	5.44H	5.53H
		5.28H	W3.19H	3.27H	3.37H	5.57H	6.03H	6.12H	6.15H	6.21H	6.29H	6.14H	6.19H	6.28H
C5.35H	5.39H	5.48H	W3.53H	4.01H	4.11H	6.21H	6.27H	6.36H	7.02H	7.08H	7.16H	W7.23H	7.29H	7.38H
5.48	5.55	6.04	W4.10H	4.19H	4.29H	6.46H	6.51H	7.00H	7.37H	7.43H	7.51H	6.49H	6.54H	7.03H
C6.06H	6.10H	6.19H	W4.27	4.39	4.49	W7.09H	7.16H	7.25H	8.12H	8.18H	8.26H	8.33H	8.39H	8.48H
6.18	6.24	6.34	W4.44H	4.53H	5.03H	7.35H	7.41H	7.50H	8.48H	8.53H	9.01H	9.09H	9.15H	9.24H
6.29H	6.36H	6.47H	W5.02	5.11	5.21	8.00H	8.06H	8.15H	9.22H	9.27H	9.35H	9.45H	9.61H	10.00H
6.48H	6.55H	7.06H	W5.22H	5.31H	5.41H	8.25H	8.31H	8.40H	9.57H	10.02H	10.10H	10.21H	10.27H	10.36H
W7.04	7.12	7.23	5.48H	5.55H	6.05H	8.50H	8.56H	9.05H	10.32H	10.37H	10.45H	10.55H	11.01H	11.10H
7.21H	7.29H	7.40H	W6.08H	6.17H	6.27H	9.15H	9.21H	9.30H	W11.08H	11.14H	11.22H	11.21H	11.26H	11.35H
7.37	7.46	7.56	6.38H	6.44H	6.52H	9.41H	9.47H	9.56H	W11.41H	11.47H	11.55H	11.45H	11.50H	11.59H
7.51H	8.03H	8.12H	7.01H	7.07H	7.15H	10.06H	10.12H	10.21H	A.M.	A.M.		P.M.	P.M.	
W8.12H	8.20H	8.29H	7.24H	7.30H	7.38H	10.38H	10.44H	10.53H	X12.12H	X12.17H		12.09H	12.14H	12.23H
W8.28	8.36	8.45	7.47H	7.54H	8.02H	11.10H	A11.09H	11.10H				12.33H	12.38H	12.47H
W8.43H	8.51H	9.00H	8.10H	8.17H	8.25H		A11.17H	11.26H				12.57H	1.02H	1.11H
W8.59	9.07	9.16	8.33H	8.40H	8.48H		A11.41H	11.42H				1.22H	1.28H	1.37H
W9.15H	9.23H	9.32H	8.57H	9.03H	9.11H	11.42H	11.48H	11.57H				1.47H	1.53H	2.02H
W9.30H	9.38H	9.47H	9.20H	9.26H	9.34H		P.M.	P.M.				2.13H	2.19H	2.28H
W9.46	9.54	10.03	9.44H	9.50H	9.58H		A12.12H	12.14H				2.38H	2.44H	2.53H
W10.01H	10.09H	10.18H	10.05H	10.12H	10.20H							3.04H	3.10H	3.19H
W10.17	10.25	10.34	10.33H	10.39H	10.47H	P.M.						W3.28H	3.35H	3.44H
W10.33H	10.41H	10.50H	W11.10H	11.17H	11.25H	12.13H	12.20H	12.29H				3.55H	4.01H	4.10H
W10.48H	10.56H	11.05H		A.M.	A.M.	12.45H	A12.44H	12.45H				4.20H	4.26H	4.35H
W11.04	11.12	11.21	W11.52H	12.00H	12.08H		12.52H	1.01H				4.46H	4.52H	5.01H
W11.19H	11.27H	11.36H					A1.15H	1.17H				5.09H	5.15H	5.24H
W11.35	11.43	11.52				1.16H	1.23H	1.32H				5.34H	5.40H	5.49H
		P.M.					A1.47H	1.48H				5.59H	6.05H	6.13H
W11.51H	11.59H	12.08H				1.48H	1.54H	2.03H				6.21H	6.26H	6.34H
P.M.	P.M.						A2.18H	2.20H				6.55H	7.00H	7.08H
W12.06H	12.14H	12.23H				2.19H	2.26H	2.35H				7.29H	7.34H	7.42H
W12.22	12.30	12.39					A2.50H	2.51H				8.04H	8.09H	8.17H
W12.38H	12.46H	12.55H				2.51H	2.57H	3.06H				8.37H	8.42H	8.50H
W12.54	1.02	1.11					A3.21H	3.23H				9.12H	9.18H	9.26H
W1.10H	1.18H	1.27H				W3.21H	3.29H	3.38H				9.45H	9.50H	9.58H
W1.26H	1.34H	1.43H					A3.53H	3.54H				10.19H	10.24H	10.32H
W1.42	1.50	1.59					4.00H	4.09H				X10.52H	X10.57H	
W1.58H	2.06H	2.15H				3.54H	A4.24H	4.26H				MX11.31H	X11.37H	
W2.14	2.22	2.31					4.35H	4.41H						
W2.30H	2.38H	2.47H					5.00H	5.07H						
W2.46H	2.54H	3.03H					5.27H	5.33H						

A-Leaves 38th & State St. at time shown. C-Leaves County Buildings at time shown. H-WHEELCHAIR ACCESSIBLE BUS.
W-Downtown via County Bldgs. & Curative Workshop. X-To 35th St. only.



**EXHIBIT 7-3
TIME TABLES SHOWING ACCESSIBLE TRIPS
(CONTINUED)**

**LINE 88
MONDAY THROUGH FRIDAY SCHEDULE**

S O U T H B O U N D									
Lv Lakeview Terrace (Eldridge Ave. & Terra Bella St.)	Lv Pacoima (Van Nuys Blvd. & San Fernando Rd.)	Lv Van Nuys Blvd. Plummer St.	Lv Van Nuys (Van Nuys Blvd. & Sherman Wy.)	Lv Sherman Oaks (Van Nuys & Ventura Blvds.)	Lv Sherman Oaks (Ventura & Sepulveda Blvds.)	Lv UCLA (Hilgard Ave. & Strath- more St.)	Lv Westwood (West- wood & Wilshire Blvds.)	Approximate Times	Ar West- chester Ave. & 98th St.)
5:00AM	5:14AM	5:21AM	5:02AM	5:14AM	5:18AM	5:33AM	5:37AM	5:50AM	5:57AM
5:05AM	5:19AM	5:26AM	5:07AM	5:19AM	5:23AM	5:38AM	5:42AM	5:55AM	6:02AM
5:10AM	5:24AM	5:31AM	5:12AM	5:24AM	5:28AM	5:43AM	5:47AM	6:00AM	6:07AM
5:15AM	5:29AM	5:36AM	5:17AM	5:29AM	5:33AM	5:48AM	5:52AM	6:05AM	6:12AM
5:20AM	5:34AM	5:41AM	5:22AM	5:34AM	5:38AM	5:53AM	5:57AM	6:10AM	6:17AM
5:25AM	5:39AM	5:46AM	5:27AM	5:39AM	5:43AM	5:58AM	6:02AM	6:15AM	6:22AM
5:30AM	5:44AM	5:51AM	5:32AM	5:44AM	5:48AM	6:03AM	6:07AM	6:20AM	6:27AM
5:35AM	5:49AM	5:56AM	5:37AM	5:49AM	5:53AM	6:08AM	6:12AM	6:25AM	6:32AM
5:40AM	5:54AM	6:01AM	5:42AM	5:54AM	5:58AM	6:13AM	6:17AM	6:30AM	6:37AM
5:45AM	5:59AM	6:06AM	5:47AM	5:59AM	6:03AM	6:18AM	6:22AM	6:35AM	6:42AM
5:50AM	6:04AM	6:11AM	5:52AM	6:04AM	6:08AM	6:23AM	6:27AM	6:40AM	6:47AM
5:55AM	6:09AM	6:16AM	5:57AM	6:09AM	6:13AM	6:28AM	6:32AM	6:45AM	6:52AM
6:00AM	6:14AM	6:21AM	6:02AM	6:14AM	6:18AM	6:33AM	6:37AM	6:50AM	6:57AM
6:05AM	6:19AM	6:26AM	6:07AM	6:19AM	6:23AM	6:38AM	6:42AM	7:00AM	7:07AM
6:10AM	6:24AM	6:31AM	6:12AM	6:24AM	6:28AM	6:43AM	6:47AM	7:05AM	7:12AM
6:15AM	6:29AM	6:36AM	6:17AM	6:29AM	6:33AM	6:48AM	6:52AM	7:10AM	7:17AM
6:20AM	6:34AM	6:41AM	6:22AM	6:34AM	6:38AM	6:53AM	6:57AM	7:15AM	7:22AM
6:25AM	6:39AM	6:46AM	6:27AM	6:39AM	6:43AM	6:58AM	7:02AM	7:20AM	7:27AM
6:30AM	6:44AM	6:51AM	6:32AM	6:44AM	6:48AM	7:03AM	7:07AM	7:25AM	7:32AM
6:35AM	6:49AM	6:56AM	6:37AM	6:49AM	6:53AM	7:08AM	7:12AM	7:30AM	7:37AM
6:40AM	6:54AM	7:01AM	6:42AM	6:54AM	6:58AM	7:13AM	7:17AM	7:35AM	7:42AM
6:45AM	6:59AM	7:06AM	6:47AM	6:59AM	7:03AM	7:18AM	7:22AM	7:40AM	7:47AM
6:50AM	7:04AM	7:11AM	6:52AM	7:04AM	7:08AM	7:23AM	7:27AM	7:45AM	7:52AM
6:55AM	7:09AM	7:16AM	6:57AM	7:09AM	7:13AM	7:28AM	7:32AM	7:50AM	7:57AM
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7:45AM	7:59AM	8:06AM	7:47AM	7:59AM	8:03AM	8:18AM	8:22AM	8:40AM	8:47AM
7:50AM	8:04AM	8:11AM	7:52AM	8:04AM	8:08AM	8:23AM	8:27AM	8:45AM	8:52AM
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8:20AM	8:34AM	8:41AM	8:22AM	8:34AM	8:38AM	8:53AM	8:57AM	9:15AM	9:22AM
8:25AM	8:39AM	8:46AM	8:27AM	8:39AM	8:43AM	8:58AM	9:02AM	9:20AM	9:27AM
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13:10AM	13:24AM	13:31AM	13:12AM	13:24AM	13:28AM	13:48AM	13:52AM	14:10AM	14:17AM
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13:30AM	13:44AM	13:51AM	13:32AM	13:44AM	13:48AM	14:08AM	14:12AM	14:30AM	14:37AM
13:35AM	13:49AM	13:56AM	13:37AM	13:49AM	13:53AM	14:13AM	14:17AM	14:35AM	14:42AM
13:40AM	13:54AM	14:01AM	13:42AM	13:54AM	13:58AM	14:18AM	14:22AM	14:40AM	14:47AM
13:45AM	13:59AM	14:06AM	13:47AM	13:59AM	14:03AM	14:23AM	14:27AM	14:45AM	14:52AM
13:50AM	14:04AM	14:11AM	13:52AM	14:04AM	14:08AM	14:28AM	14:32AM	14:50AM	14:57AM
13:55AM	14:09AM	14:16AM	13:57AM	14:09AM	14:13AM	14:33AM	14:37AM	14:55AM	15:02

EXHIBIT 7-3
 TIMETABLES SHOWING ACCESSIBLE TRIPS
 (CONTINUED)





ROUTE #16

MONDAY THRU FRIDAY

NORTHBOUND

SOUTHBOUND

							
7th AVE & DOBBINS	CENTRAL & BASELINE	CENTRAL & BROADWAY	TERMINAL	TERMINAL	CENTRAL & BROADWAY	CENTRAL & BASELINE	7th AVE & DOBBINS
607A	611	616	627A		554	558	607A
703	709	716	727	630A	640	646	703
727	733	740	750		709	715	727
803	809	816	827	730	740	746	803
903	909	916	927	830	840	846	903
1003	1009	1016	1027	930	940	946	1003
1103	1109	1116	1127	1030	1040	1046	1103
1203P	1209	1216	1227P	1130	1140	1146	1203P
143	149	156	207	110P	120	126	143
243	249	256	307	210	220	226	243
343	349	356	407	310	320	326	343
443	449	456	507	410	420	426	443
543	549	556	607	510	520	526	543
639	643	647		615	625	630	639

NORTHBOUND: From Dobbins & 7th Ave. - East on Dobbins; North on Central; East on Jefferson to Terminal.

SOUTHBOUND: From 1st St. & Washington (Terminal) - West on Washington; South on Central; East on South Mountain; South on 7th St; West on Monte Way; South on Central; West on Piedmont; North on 10th Ave; East on Dobbins to 7th Ave.



Park n' ride lot, see map.



All trips are equipped with wheelchair accessible buses. For further information on their use please call 257-8426.

Subject to change without notice

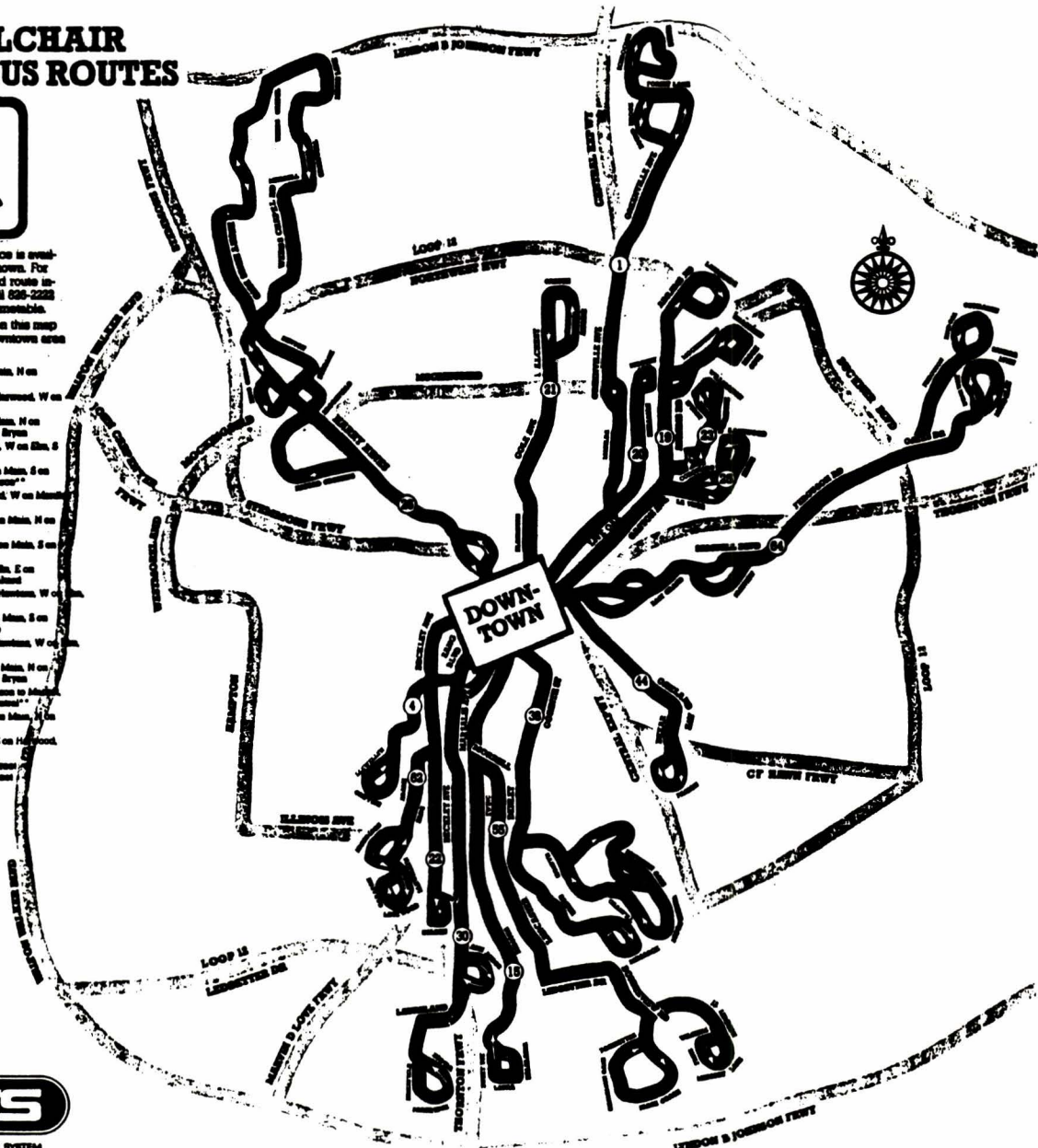
**EXHIBIT 7-4
MAP OF ACCESSIBLE ROUTES
DALLAS TRANSIT SYSTEM**

**WHEELCHAIR
LIFT BUS ROUTES**



Wheelchair lift service is available on the routes shown. For precise schedule and route information, please call 828-3223 or obtain a printed timetable. Bus lines indicated on this map are routed in the downtown area as follows:

- 10--**ARCADE**—E on Main, N on Central**
 - 11--**BIRCHLEY**—S on Harwood, W on Elm
 - 12--**BRADSHAW**—E on Main, N on Harwood to Clark, E on Bryan
 - 13--**BRIDGE**—S on Pearl, W on Elm, S on Houston
 - 14--**FRANKLIN**—W on Main, S on Oakley*** E on Commerce**
 - 15--**FRISBIE**—N on Albert, W on Main to Young, N on Griffin
 - 16--**LEATHERWOOD**—E on Main, N on Central**
 - 17--**LEWISWOOD**—W on Main, S on Lamar
 - 18--**LINCOLN**—E on Griffin, E on Young to Martin, S on Albert
 - 19--**MARSHALL**—S on Houston, W on S on Houston
 - 20--**ORCHARD**—W on Main, S on Lamar, E on Commerce
 - 21--**BARBERS**—S on Houston, W on S on Houston
 - 22--**DELAWARE**—E on Main, N on Harwood to Clark, E on Bryan
 - 23--**EMILE**—N on Jefferson to Market, E on Main and N on Central**
 - 24--**WYNDHAM**—E on Main, N on Central**
 - 25--**WYNDHAM**—S on Harwood, W on Elm
- **Last stop is at Pearl Street
***No stops on Griffin Street



7.1.4 User Training Sessions - The concept of user training involves demonstrations and practice sessions for groups of handicapped persons. At these sessions, the potential user is able to become familiar with the lift and the securement device operation in an unhurried, "friendly" atmosphere, and in this way, is already experienced in using the lift when he or she goes to the bus stop for the first time.

The program should consist of a film or slide show, where one exists; a brief lecture and question-and-answer session; the distribution of brochures and other marketing materials; and the opportunity to use the lift and securement device. The first two components are more suited to a formal group meeting whereas the last two should always take place at a demonstration. To the extent possible, conditions at the training site should closely approximate actual operations in terms of vehicle capacity and slope of the lift's ramp.

User training sessions should be scheduled at major travel generators for potential handicapped passengers such as rehabilitation centers, community centers, schools, and housing complexes. A transit system can contact consumer organizations to assist in setting up the sessions. Often, the organization will include this as part of a regularly-scheduled meeting. Organizations and agencies will often be willing to call a special meeting for the express purpose of the training session. The handicapped advisory committee can be instrumental in scheduling these as well as in spreading the word to potential attendees. Alternatively, the transit system could develop a schedule for the sessions at a variety of locations and then publicize them through the agencies. Either approach is recommended. The key considerations are that the schedule be known and potential users be present. As a preview to this program, the transit system could invite agency personnel to a demonstration. This would acquaint them with the vehicle and the nature of the user training session and will enhance the publicity of their own program.

Initially, these sessions should concentrate on group meetings. However, some transit systems have responded to individual requests for demonstrations realizing that they result in smoother operations. Individual sessions often take place after the service is already operating.

7.1.5 Press Releases - There are a number of marketing activities that rely on print and electronic media for advertising. Information is often sent to local newspapers, radio and television stations in the form of press releases and paid advertisements. This practice should be expanded to reach the handicapped community.

One medium which has proven effective are special newsletters published by handicapped consumer organizations and social service agencies. The handicapped advisory committee can help the transit system develop a list of these publications. In turn, the list should be used for distributing all routine press releases which might announce the start of accessible service as well as those of special interest; e.g., announcing user training sessions. The transit system should distribute this information with adequate lead time for publication in monthly or bi-monthly newsletters.

Another possible medium is the special radio station for visually-impaired persons which exists in some cities. Brief 10- or 30-second announcements can be sent to the station to be read to listeners.

7.2 Information for Current Riders

A positive response by existing riders to the availability of accessible service will contribute to its successful operation. Providing them with information on accessible service is recommended. Several systems have prepared handouts for on-board distribution to announce the start of accessible service. In Champaign-Urbana, Illinois, a special brochure entitled "Total Accessibility is Coming" was distributed to regular patrons prior to the start of accessible service. It illustrated the lift, fold-up seats and kneeler; stated the commitment to accessibility; and answered several basic questions on the project. Excerpts from the text follow:

Will I Have to Do Anything Differently?

Yes. There will be some minor procedural changes. For instance, most of the time anyone will be able to use the fold-up seats near the front of the bus, but able-bodied passengers will be asked to give those seats up if a passenger in a wheelchair boards the bus.

Also, it will be even more important to exit using the rear door when a wheelchair passenger is boarding or getting off the bus. (It's always a good idea!)

Will Accessibility Slow MTD Service Down?

Maybe. Naturally, it will take a little longer to board by using the wheelchair lift than it does to walk onto the bus. But the lift works

quickly, and we think delays will be so brief that you won't notice them.

Why Has the MTD Decided to Make Its Bus System Accessible?

Federal law prohibits denying handicapped people the benefits of any program which receives federal subsidy. But long before the Department of Transportation's rules and regulations regarding accessibility were developed, the MTD was committed to this new service.

While people with certain physical handicaps have not been able to use the services of the MTD, they have always paid the taxes which help to support those services.

It is now technically possible to provide public, fixed-route transportation which handicapped people can use. We would not be fulfilling our commitment to the public if we did not make service available to as many people as we can.

Seattle utilized its practice of distributing one-page "Rider Alerts" to let its regular patrons know that they were riding on an accessible bus. The hand-out, shown as Exhibit 7-5, gives an address and telephone number for further information.

Other techniques for alerting current riders which should be considered are articles in the system's enroute newsletters (such as a "Rider's Digest" or a "Message from the General Manager") and notices on "car cards" placed on the overhead advertising racks. All of these approaches keep regular riders informed. They also provide them with basic information which they can relay to any potential handicapped passengers they might know.

7.3 Information for the General Public

The introduction of accessible service should be marketed through the customary avenues of paid advertisements and public service announcements. Staged presentations and demonstrations should also be held for the initial start of service. These two techniques - - advertisements and community presentations - - are the focus of this section. While it is realized that some potential handicapped passengers and current riders will be reached through these programs, the

EXHIBIT 7-5
SEATTLE METRO ON-BOARD HANDOUT

Rider Alert



Wheelchair Lift

The Route 6/16 is presently offering Accessible Service with lift-equipped buses for handicapped passengers.

Route and schedule information is updated regularly in "The Lift Bulletin" which is available in the Customer Assistance Office, 821 Second Avenue, Seattle, Wa. 98104.

If you need specific information on lift-equipped buses, call the Metro Information Operator at 447-4800 (24-hours-a-day).



limited level of detail they provide and the diversity among the target populations' viewing, reading, and listening habits are the major reasons why the previous activities are recommended as a more direct marketing approach. Nonetheless, if a transit system relies on the local media to publicize service changes and promotions, then these same media should be used to market accessible service.

7.3.1 Advertisements - Brief announcements about the starting date for accessible service and the routes which will be made accessible can often be accomplished through press releases and free public service announcements. Media coverage and its inherent free advertising may also be possible for reporting the first day of service. Sample press releases to the print media follow as Exhibit 7-6. Sample 10- and 30-second public service announcements developed to run prior to the start of accessible service in Phoenix read as follows:

Ten Seconds: Need a Lift? Starting August 31st, Phoenix Transit will operate fifteen buses equipped with wheelchair lifts for the handicapped. If you are disabled and need a lift, call 257-8426 for complete information.

Thirty Seconds: Need a Lift? Beginning August 31st, Phoenix Transit will operate buses equipped with wheelchair lifts on three of its principal routes. These buses will operate on Route 8, North 19th Avenue and West Cactus Road...on Route 16 down South Central...and Route 27, on East Roosevelt. If you are disabled and need a lift, call Phoenix Transit for further information on fares, schedules or bus stops. The number is 257-8426.

These can be distributed to newspapers, radios and television stations. Another medium which frequently plays public service announcements is cable television. Some transit systems have booked a staff person on afternoon television and radio talk shows to discuss the new service. However, if the transit system wants to determine when and where the information is published and aired, it will have to turn to paid advertisements. In many markets, the purchase of advertising space and time may preclude the system from receiving free public service announcements for the same campaign. Often radio stations will agree to match the transit system's purchase of air time with a free announcement.

Because of the unusual qualities of an accessible bus and its relatively limited audience, it may not be possible to purchase enough time and space to fully explain the service.

EXHIBIT 7-6
SAMPLE PRESS RELEASES



NEWS RELEASE

Milwaukee County Transit System

4212 WEST HIGHLAND BLVD., MILWAUKEE, WI 53208

344-4550

H. M. MAYER, Managing Director

35-79

May 25, 1979

CONTACT: Tom Knight or
Joseph A. Caruso
344-4550

RELEASE IMMEDIATELY

The Milwaukee County Transit System will begin operating lift-equipped buses on Route No. 18 (National Ave.) on Memorial Day, Monday, May 28, Supervisor Thomas P. Kujawa, Chairman of the County Board's Mass Transit Committee announced today.

Route No. 18 will be the sixth transit system route with operating lifts. It serves important retail, health care and recreational facilities. All trips operating on Route No. 18 during non-rush hours, weekends and holidays and more than half of the rush-hour trips will be assigned lift-equipped buses. A timetable indicating which buses are lift-equipped is available on request.

Other routes assigned lift-equipped buses are the No. 10 (Wells-Wisconsin), No. 14 (Holton-Mitchell), No. 23 (Fond du Lac Avenue), No. 27 (27th Street), and No. 71 (State Street). All operate seven days a week.

A reduced fare of 25 cents is charged to persons in wheelchairs except during the hours of 6 AM to 9 AM and 3 PM to 6 PM Monday through Friday when the full fare is in effect. Wheelchair users may also take advantage of the special 10-cent fare currently in effect after 7 PM Monday through Saturday and all day Sunday. An attendant assisting a person in a wheelchair may ride free when the reduced fare is in effect.

Buses with operable lifts have been in regular route service for 37 days since April 18. During that time 38 one-way trips have been made by wheelchair-confined persons. Each lift-equipped bus has space for one wheelchair and only persons in wheelchairs are permitted to use the lift. They are also required to get on and off at regular bus stops.

Handicapped persons using a wheelchair may call the Milwaukee County Transit System at 344-6711 any time, any day for information concerning routes, fares, transfers, bus stops and instructions concerning how to get on and off lift-equipped buses. A special brochure explaining how to use the lift-equipped buses and timetables for all six lift-equipped routes will be mailed to those interested, free of charge.

EXHIBIT. 7-6
SAMPLE PRESS RELEASES
(Continued)



NEWS RELEASE

Milwaukee County Transit System

4212 WEST HIGHLAND BLVD., MILWAUKEE, WI 53208

344-4550

H. M. MAYER, Managing Director

28-79

May 4, 1979

CONTACT: Joseph A. Caruso
(414) 344-4550

RELEASE IMMEDIATELY

SPECIAL TO PASSENGER TRANSPORT - PIX OUTLINE

Milwaukee is now the second transit system in the United States with system-wide bus routes accessible to wheelchair users. Wheelchair lift-equipped buses began operating on five Milwaukee County Transit System bus routes on April 18.

The first wheelchair user to ride a lift-equipped bus was Mike Johnson (shown in pix) who took the bus to the Curative Workshop for his regular activity and therapy session. He had to make one transfer to complete his 7-mile trip.

Fifty lift-equipped buses are assigned to these five routes which operate seven days a week. Special timetables indicating which buses are lift-equipped are available on request. A special brochure explaining how to use the lift-equipped buses is mailed to those interested free of charge.

Transit System officials have been pleased with the general reliability of the lift mechanism. After 14 days of operation a total of 27 one-way trips have been made on lift-equipped buses of the Milwaukee County Transit System.

The inauguration of the wheelchair lift-equipped buses has been widely publicized in the media and includes a continuing strong newspaper and radio advertising campaign.

In addition to Milwaukee, the only other transit system in the nation with wheelchair lift-equipped buses in regular urban service is St. Louis.

EXHIBIT 7-6
SAMPLE PRESS RELEASES
(Continued)



RTD NEWS

RTD-097
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT
425 South Main Street, Los Angeles, California 90013
(213) 972-4323

Contact: Kathleen McGov/Jim Smart

May 13, 1981

FOR IMMEDIATE RELEASE

RTD RESUMES WHEELCHAIR SERVICE ON 11 MORE LINES MAY 18;
WEEKEND AND HOLIDAY SERVICE PLANNED ON 21 LINES BY JUNE 1

RTD bus service for persons in wheelchairs will be increased from 10 to 21 lines, effective Monday, May 18, Richard T. Powers RTD acting general manager announced.

The 11 lines resuming wheelchair service are lines 9, 35, 55, 152, 432, 447, 813, 820, 827, 846 and 849. These accessible lines will join ten others which restored wheelchair service April 13. Those lines were 44, 83, 88, 93, 204, 423, 440, 456, 480 and 841.

Also on target for a June 1 implementation is the addition of weekend and holiday accessible service on these 21 lines.

"An expedited repair program on 200 AM General buses equipped with front door wheelchair lifts has made it possible to restore RTD accessible bus service in Los Angeles County," said Thomas Neusom, RTD board president. "The ability to expand our accessible service to weekends and holidays is a direct result of this repair effort."

The RTD temporarily suspended wheelchair service on all 21 of its lines offering accessible service February 1 after cracks were found in the support plates of more than 140 of the automatic wheelchair lifts. Repairs were performed jointly by AM General and the lift manufacturer, Transportation Design and Technology. Additional steel support plates were added to reinforce the lift mechanism.

Neusom said the RTD plans to expand it's accessible service later this year by beginning the operation of rear door wheelchair lifts on the District's new General Motors buses.

In preparation for operating rear door lift thousands of bus stops will be inspected to insure there is sufficient space to operate the lifts on the GM buses. In some instances longer bus stops are required for an operator to pull a bus into a stop and position the rear door lift within 12 inches of the curb for safe wheelchair access to the bus.

The District already is working with the City of Los Angeles to extend most stops that require it, and soon will request the assistance of other cities where bus stop extensions are necessary to handle the rear-door lift GM buses.

Instead, a brief overview is suggested which concludes with the transit system's public information telephone number. Some suggestions for paid advertisements include:

- One-quarter or one-eighth page newspaper advertisements showing the network of accessible routes;
- Thirty second or one minute radio announcements listing some of the destinations served by the accessible buses; and
- Ten second or thirty second television spots showing someone boarding the bus with the help of the kneeler and/or the lift.

Personnel for the television spots can be either members of the handicapped advisory committee, staff members, or models. In some cases, portions of a driver training film can be used for this purpose.

7.3.2 Community Presentations - These activities include site demonstrations with an accessible bus and presentations to organizations without the vehicle present. The former is similar to the user training sessions, except that the locations may be shopping centers or downtown business districts where fewer handicapped persons might be present. As always, marketing materials should be available for distribution and staff should be able to respond to specific service questions. These demonstrations can also be held for the media as an opportunity to photograph the bus. The latter suggestion includes presentations to community groups including chambers of commerce, service and fraternal organizations, and groups of public officials. Information on accessible services could be included in community presentations on subjects not directly related to accessibility; integrating accessibility information into the general discussion helps the public perceive accessible service as an ordinary adjunct to public transportation.

* * * * *

A number of marketing programs are recommended to coincide with the phase-in of accessible service. To reach potential handicapped persons, the following items should be prepared:

- A brochure illustrating the boarding, alighting and securement procedures for lift and kneeler users along with a discussion of operating policies;

- Revised timetables indicating that the route is accessible and which trips will be operated with lift-equipped buses;
- A map of the routes, updated for each expansion of accessible service;
- User training sessions to orient potential users to the lift and securement device operations; and
- Press releases to be included in organization and agency newsletters.

Information dissemination to current riders in the form of an on-board handout and to the general public through the local media and community presentations is also recommended. These programs should be designed to enhance the transit system's phase-in activities by informing and attracting new users.

CHAPTER 8 MONITORING AND EVALUATION

Many transit systems conduct a monitoring and evaluation program to assess the ridership, operational, and financial performance of their services. With the phase-in of accessible service, these programs should be expanded to include monitoring and evaluating the impacts of accessible service on system performance. Transit systems will be able to use such information to revise current operating and maintenance policies as necessary, and to plan the implementation of additional service.

Transit systems should review their current monitoring and evaluation practices and determine how to best integrate this new aspect of service into current data collection and analysis activities. Five basic steps should be followed:

- . Develop an evaluation framework,
- . Identify evaluation measures,
- . Select and design data collection methods,
- . Determine data collection frequencies and sampling procedures, and
- . Design an evaluation reporting format.

This chapter describes the issues and considerations associated with each step and offers guidance for developing a monitoring and evaluation program for fixed-route accessible services.

8.1 Evaluation Framework

As a first step, the transit system should develop a framework to guide the design and conduct of its proposed monitoring and evaluation program. This will identify areas which require immediate attention and produce information useful for fine tuning and modifying existing service. It will allow the system to implement additional accessible service more judiciously. Evaluation criteria and associated measures can be developed which could provide adequate information for making decisions concerning scheduling changes, vehicle assignments, spare vehicle ratio, driver and mechanic training needs,

staffing needs and budgeting practices. To assist the transit system in these decisions, a monitoring and evaluation effort should answer, at a minimum, the following questions:

- . Should schedules be adjusted as a result of accessible service?
- . Are accessible features, primarily the lift, being used?
- . Are wheelchair users being denied service? If so, why?
- . Are drivers adhering to adopted operating procedures?
- . Are the adopted operating policies and procedures safe, and are they adequately meeting the needs of transportation handicapped passengers?
- . Is overall system reliability impaired?
- . Are lift servicing and maintenance programs adequate? If not, why not?
- . What are the labor and material requirements for maintaining and repairing accessible buses?

The evaluation framework should identify the information needs to be addressed by the program. Good planning practice suggests that only information which will serve as input into the decision-making process be included. The collection of the necessary information should be economical and efficient.

8.2 Evaluation Measures

A series of evaluation measures should be developed to gauge the use and impacts of accessible service. Measures can be categorized by the activities they monitor, in this case either operations or maintenance, and by type of measure, either descriptive or quantitative. Evaluation measures listed in Exhibit 8-1 address the concerns discussed in the previous section. The use of each is described in this section.

8.2.1 Operations Monitoring - The operations monitoring program should provide specific information pertaining to the dependability, effectiveness, quality and utilization of accessible service. Five measures are recommended:

- Ratio of On-Time Trips to Total Trips: measures the extent to which accessible buses arrive on time. The information is used to adjust running times and trip schedules when necessary. Missed runs are not included here; they are reported as part of service reliability.
- Number of Times the Lifts Are Used: indicates the use rate. High use on a route may signify it as a candidate for receiving more frequent accessible service. Low use may suggest a reallocation of service.
- Number of and Reasons for Pass-Bys: indicates the system's ability to meet existing demand for service. Pass-bys caused by equipment malfunctions may suggest the need for changes in maintenance procedures and/or driver training programs. Pass-bys caused by unavailable wheelchair securement positions may suggest the need for either more frequent accessible service or more securement positions per bus. Those caused by crowding conditions may also signal the need for more frequent service or the redesignation of accessible trips.
- Passenger Feedback: reflects the public's response to accessible service. It indicates if drivers are following adopted operating procedures and if these procedures are appropriate for meeting accessibility needs.
- Number and Types of Accidents: indicates the need to revise operating procedures, revise equipment specifications, revise and/or increase the frequency of driver training, and/or expand the user training program.

All of these measures, when combined, depict how effectively the accessible service is being operated.

8.2.2 Maintenance Monitoring - Measures in this area monitor the reliability of accessible buses and the resources required to maintain accessible buses for service. In addition, a maintenance monitoring program should identify recurring malfunctions and repair problems. Four measures are recommended:

EXHIBIT 8-1
RECOMMENDED EVALUATION MEASURES

	<u>Descriptive Measures</u>	<u>Quantitative Measures</u>
Operations Evaluation	... <i>Adherence to and Adequacy of Operating Policies and Procedures</i> — Passenger feedback by way of letters, telephone calls, and public meetings.	... <i>Schedule Adherence</i> — Ratio of on-time trips to total trips.
	... <i>Service Denials</i> — Reasons for pass-by.	... <i>Frequency of Lift Usage</i> — Number of times the lifts are used for wheelchair users and semi-ambulatory passengers.
	... <i>Safety</i> — Type of accidents.	... <i>Service Denials</i> — Number of pass-bys.
Maintenance Evaluation	... <i>Maintenance Requirements</i> — Types of equipment malfunctions and repairs.	... <i>Safety</i> — Number of accidents.
		... <i>Service Reliability</i>
		— Ratio of missed trips to total trips
		— Miles between accessibility component-related road call
		... <i>Maintenance Requirements</i>
		— Number of malfunctions and repairs
		— Labor and materials

- Ratio of Missed Trips to Total Trips: describes the reliability of accessible service and indicates if the spare ratio is adequate.
- Number of Service Miles Between Accessibility Component Related Road Calls: suggests the need to revise the frequency of preventive maintenance checks and adjust the spare ratio, if necessary.
- Number and Type of Equipment Malfunctions and Repairs: measures the effectiveness of servicing procedures and preventive maintenance practices. The monitoring of malfunctions should be by cause. The predominance of certain types of failures may suggest changes to repair procedures, training programs, and also may indicate if the equipment needs retrofitting or if specifications for future procurements should be revised.
- Labor and Materials: indicates the need for changes in personnel requirements and parts inventories. For instance, if the system dedicated two mechanics to lift work and determined that excessive overtime was spent on repairing lifts, it may want to hire additional workers or reassign personnel.

These four measures depict the effectiveness of the maintenance program for accessible buses.

8.3 Data Collection Methods

Next, methods for collecting the necessary data are developed. Data gathering activities should be coordinated and integrated with the system's current data collection program. Established procedures at the individual system suggest the most convenient method to collect the desired data.

Some of the information (e.g. trip denials and lift failures) can be gathered through ongoing reporting methods. Other data items relating to service quality, such as on-time performance, should be collected through a periodic monitoring program. The following section suggests ongoing and periodic data collection techniques for obtaining the needed information.

8.3.1 Ongoing Data Collection Methods - Ongoing data collection can be easily administered without a team of field observers. Data can be obtained by using a variety of collection methods, including those listed in Exhibit 8-2 and described below.

- . Trip Sheets: Many systems require drivers to complete a log recording information about each trip. This trip sheet should be modified to monitor some of the operations and maintenance impacts of accessible service such as those presented in Exhibit 8-3. Sample responses are shown in the exhibit for illustrative purposes only. Since this hypothetical system permits only wheelchair users to ride the lift, its trip sheet requires a count of wheelchair boardings as an indicator of lift usage. For example, on trip number 102 lift-equipped bus number 4 was operated. On that trip a wheelchair user was denied service because the lift could not be deployed. As a result, bus number 4 was replaced by bus number 7. The sample trip sheet is used to obtain information on lift usage, pass-bys, and missed trips. Additionally, the recording of lift malfunctions will yield data on the number of trips in which the lift was inoperable.
- . Passenger Phone Calls and Letters: Complaints about accessible service will be received by telephone or letter. These complaints should be monitored by route to pinpoint specific service problems. Problem areas which could emerge include driver non-compliance with the policy for passenger assistance; recurring pass-bys; schedule non-adherence; and inaccessible passenger facilities.
- . Accident Report: Accident reports completed by drivers and supervisors are used to monitor accidents resulting from accessibility components, particularly the lift. These reports should indicate, where possible, whether the equipment, driver, or passenger was at fault; the extent of damages to equipment and injuries to passengers; and the actions that should be taken to prevent the accident from happening again.
- . Road Call Report: A transit system's road call report is the primary tool for collecting information on lift and kneeler reliability. The road call report can be used to determine the number of miles between lift and kneeler related in-service breakdowns. It can be used to supplement maintenance data on the cause of lift and kneeler failures.

EXHIBIT 8-2

DATA COLLECTION METHODS

<u>Collection Method</u>	<u>Evaluation Measure Obtained</u>
Ongoing Methods	
... Driver Trip Sheet	... Ratio of on-time trips to total trips ... Number of times the lifts are used ... Number of and reasons for pass-bys ... Ratio of missed trips to total trips
... Passenger Telephone Calls and Letters	... Passenger feedback
... Accident Report	... Number and types of accidents
... Road Call Report	... Number of miles between accessibility component-related road calls
... Lift Repair Record	... Number and types of malfunctions and repairs ... Labor and materials
... Bus Inspection and Main- tenance Report	... Number and types of malfunctions and repairs
... Time Report and Parts Requisition	... Labor and materials
Periodic Monitoring Methods	
... Ride Check	... Ratio of on-time trips to total trips ... Number of times the lifts are used ... Number of and reasons for pass-bys
... Point Check	... Ratio of on-time trips to total trips

- . Lift Repair Record: A summary lift repair record should be completed from individual bus repair records to record all lift repair work, the number of times each lift is repaired, and the number of repairs by type. Labor and parts required to repair a lift could be included. Information that should be reported includes:
 - description of the malfunction,
 - description of the repairs made,
 - labor hours spent on the repair,
 - parts used,
 - mileage,
 - date, and
 - bus number.

Other ongoing report forms should be modified for recording lift-related maintenance work, also. These forms are a data source for the monitoring program particularly if a lift repair record as described above does not exist.

- . Bus Inspection and Maintenance Report: This report documents of preventive maintenance servicing, notes any defects found during inspection, and describes scheduled repairs. The form can be modified, as shown in Exhibit 8-4, to include information on repairs recommended by the lift manufacturer.
- . Time Report: This record can be used to evaluate maintenance labor. It will reflect the number of labor hours needed for maintenance and repairs and can indicate if staffing level changes are warranted.
- . Repair Parts Requisition Report: This report is useful for maintaining an adequate spare parts inventory. It can indicate which repairs are most common and if maintenance practices should be changed.

Each of these techniques relies on revising existing reporting methods to include those events directly related to the accessibility components. The methods will be able to collect virtually all necessary maintenance data and a portion of the operating data needed for the monitoring and evaluation program.

**EXHIBIT 8-4
SAMPLE BUS INSPECTION AND MAINTENANCE
RECORD FORM**

Bus No. _____ No. _____
 Date Due _____ Mileage _____ Date Completed _____ FUEL MILES PER GAL. _____
 OIL MILES PER QT. _____

B INSPECTION 6,000 MILES

B INSPECTION 6,000 MILES

DESCRIPTION	REP. MADE	ADJ.	OK	MECH INIT.	DESCRIPTION	REP. MADE	ADJ.	OK	MECH INIT.	UNIT CHANGES
ENGINE AND TRANSMISSION					BODY					
Accelerator Control Linkage					Outside Panels					
Engine Air Intake and Filters					Cracked Glass					
Engine Support Mountings					Interior—Floor—Steps—Panels					
Radiator, Fan, Hoses					Seats - Stanchions					
Air, Oil, Water and Fuel Leaks					Wheelclamp, Bar, Seatbelt					
Air Comp. Time to Fill Tanks					Doors—Front—Speed					
Adj. Clutch Shift Cables					Rear—Treadles—Speed					
					Windshield Wipers—Speed—Blades					
					Windshield Washer					
CHASSIS					ELECTRICAL					
Axle Studs Wheel Lugs					Battery: Voltage Gravity					
Tie Rods Drag Links					Water—Cables—Grease Cradle					
Suspension: Springs Bellow—Valves					Solenoid—Cables					
Shock Absorbers Sway Bars					Voltage Regulator—Setting—Cables					
Brakes—Lining Thickness %F—R—Adj.					Interior and Exterior Lights					
Hand Brake Linkage Adj.					Horn—Instrument Panel					
Quick Release and Application Valve					Heaters and Defrosters					
Air—Tires—lbs.—F—R					Switches—Fuses—Buzzers					
Check Anti-Freeze Degree					Emergency Warning System					
Check Emergency Stop					Public Address System					
Speedometer—Adaptor					Lubricate Chassis—AC Drive Line					
Clean Heater Filters					Run Engine—Check for Leaks					
Oil Defroster Levers—Etc.					Engine Oil Pressure: Hot Cold					
Check Fire Extinguishers										
Check Flares										
LUBRICATION					WHEELCHAIR LIFT & CONTROL BOX					
Overhead Valves, Injector Rack					Perform major inspection on					
Stall Idle Gov.					lift and control box (<i>list the manufacturer's recommended inspection steps here</i>)					
Alternator Length										
Starter Draw Test, Volts Amps										
AIR CONDITIONING										
Refrigerant Level					Defects Noted and Repairs Made:					
Oil Level										
Belts Fan Alt. or Pump										

NOTE: Circle Items Repaired.
 Defective Items Not Repaired List on Back of Card.

 Foreman's Signature

8.3.2 Periodic Data Collection Methods - Methods categorized as periodic are conducted at regular or irregular intervals. They rely on special data collection teams instead of drivers and maintenance personnel. As shown previously in Exhibit 8-2, periodic methods should be used to collect data for the operations evaluation. Periodic data collection techniques are not needed for the maintenance evaluation since these data items are collected with ongoing techniques.

Most transit systems undertake a periodic data collection effort to gather ridership related statistics. Accessibility related measures should be incorporated in their conduct with the following methods:

- . Ride Check: A ride check gathers service use and quality information. It can be used to monitor lift use, pass-bys, and schedule adherence. As can be seen from the sample responses in Exhibit 8-5, the checker fills in all the bus stop locations and notes each use of the lift. Passengers are identified as step or lift users.
- . Point Check: Data on schedule adherence of accessible trips also can be obtained from point checks. Checkers record information at major bus stops, i.e., those which are served by multiple routes and generate high passenger loads. If lift use is restricted to persons who use wheelchairs, lift use could be monitored at the check point. To do so, checkers would briefly step on board the bus to count how many securement devices are occupied.

The evaluation of the phase-in of fixed-route accessible service will require a combination of both ongoing and periodic data collection activities. These techniques will provide adequate data to evaluate the operations and maintenance of accessible buses.

8.4 Data Collection Frequencies and Sampling

The ongoing collection methods described above require that data be collected on a continuous basis. The one possible exception to this rule is the use of driver trip sheets. These could be completed on the basis of a sample of routes and trips. The difficulty, however, with a sampling approach for measuring lift usage is the anticipated low level of wheelchair user ridership. A relatively low incidence of wheelchair user

trips would necessitate an extremely large sample size of bus trips. It is therefore suggested that trip sheets documenting the number of wheelchair user trips and the number of pass-bys be completed for every accessible bus trip during the initial phase-in period. As the level of wheelchair users grows, sampling at less than 100 percent could become feasible.

Periodic data collection efforts which require the use of a survey team usually are conducted at regular intervals. The frequency varies by system. For instance, if schedules are adjusted on a quarterly basis, the periodic data collection efforts could reflect this cycle in order to provide timely input into the planning process. Another benchmark to consider in scheduling data collection is the schedule of sub-phases for future expansion of accessible service.

Ride checks and point checks should be conducted using some type of sampling strategy; data collected by these methods cannot be feasibly collected for all trips, for all routes, for every service day. A sampling plan determines the timing and the quantity of data collection. Factors to consider in developing a sampling schedule include service variations by time-of-day, day-to-day, week-to-week and season-to-season.

Next, the transit system determines the quantity of data or the number of trips for which data must be collected. A standard sample size for use by all systems cannot be recommended for two reasons. First, the characteristics of each data item to be measured will vary among systems; second, the number of scheduled trips will vary by route. Therefore, a sample size for one route or system could be inadequate for another. Each transit system must develop its own individualized sampling plan for ride and point check data collection efforts.

The designing of a sampling plan requires an understanding of several fundamental statistical concepts related to sample size. These include accuracy and its components of tolerance and confidence levels; data variability; and statistical significance. Detailed instructions and guidelines for developing a sampling plan can be found in the recent bus transit monitoring manual published by the Urban Mass Transportation Administration⁽¹⁾.

8.5 Evaluation Reporting Format

A monitoring and evaluation program provides the transit system with valuable information for adjusting its current operating and maintenance practices and for guiding the phase-in of additional accessible service. The findings of the monitoring effort should be organized into a concise format which clearly conveys the desired information. Therefore, once the evaluation measures, data collection methodology and reporting frequencies have been established, a final step in planning a monitoring and evaluation program should be the development of a report format to present the findings.

A suggested report format with sample responses as shown in Exhibit 8-6 allows for a comparison of current performance with the performance in the previous year during the same period. The format also provides a summary of performance for the current year to date. It presents quantitative evaluation measures and space for descriptive performance indicators, required action steps, and comments. The information contained in this report is useful to adjust current service and plan the implementation of subsequent phases of accessible service.

To complete the summary form, all data items identified for the monitoring and evaluation program should be assembled for the particular route. Exhibit 8-6 portrays data for Route 12, a hypothetical partially accessible route which operates at thirty minute headways during peak periods and hourly frequencies at other weekday times and on Saturdays. A three-month period within which approximately 2,000 accessible trips were scheduled is being evaluated.

This hypothetical route exemplifies how a monitoring and evaluation program can help transit systems make informed policy decisions. The information creates a foundation of experience on which decisions can be made. For example, by evaluating schedule adherence over a period of time, the question of whether to modify schedules as a result of increased dwell time and running time will be resolved. Another application of the monitoring and evaluation program relates to wheelchair user ridership rates and pass-bys. As illustrated in the example, if high utilization on a particular route is exhibited over an extended period, the route is a candidate for receiving more frequent accessible service. If the monitoring program documents that wheelchair users are passed by because

EXHIBIT 8-6
SAMPLE PERFORMANCE SUMMARY REPORT

Route No. 12

Reporting Period: From April through June 1980

<u>Measure</u>	<u>Previous Year Period</u>	<u>Current Period</u>	<u>Percent Change</u>	<u>Year-to-Date</u>	<u>Description</u>	<u>Action Required/Comments</u>
<i>Operations Evaluation</i>						
. Ratio of On-Time Trips to Total Trips	82% on-time	74% on-time	- 11%	75% on-time		If next report shows continued decrease, schedule change is needed.
. Number of Times a Lift is Used	20	66	+230%	96		
. Number and Reasons for Pass-bys	4	6	+ 50%	10	3 lift breakdowns; 1 wheelchair didn't fit wheelclamp device; and 2 occupied securement positions.	Check that brochures list those types of wheelchairs which do not fit into clamp.
. Number and Types of Accidents	1	0	-100%	2		
. Passenger Feedback					1 complaint about wheelclamp not fitting wheels; 2 complaints concerning denials of service; 2 complaints about two no-show accessible buses; and 1 complaint about insensitive driver yelling at passenger.	
<i>Maintenance Evaluation</i>						
. Ratio of Missed Trips to Total Trips	1%	0.6%	- 40%	0.8%		Good progress, in part due to good weather conditions.
. Number of Miles between Accessibility Component-Related Road Calls	3,575	4,500	+ 26%	4,400		Good progress
. Number and Type of Malfunctions and Repairs						
- Mechanical	12	9	- 25%	19		Check other routes for a similar increase in hydraulic repairs.
- Electrical	15	10	- 33%	22		
- Hydraulic	20	25	+ 25%	55		
. Labor and Materials	140 hours	125 hours	- 11%	263	Hydraulic valves, 2 cylinders, 1 roller chain, bearings, and micro-switch.	

of the unavailability of securement positions, greater capacity for wheelchairs on each bus or higher frequencies of accessible service is needed.

* * * * *

This chapter described the steps for developing a monitoring and evaluation program. These steps are: develop an evaluation framework; identify evaluation measures; select and design data collection methods; determine data collection frequencies and sampling procedures; and, design an evaluation reporting format. The transit system should select procedures which are best suited to its existing efforts and which will allow the monitoring of accessible service to be integrated within its current data collection program. The results of a monitoring and evaluation program should provide adequate information for fine-tuning existing service and for planning the implementation of additional accessible service.

FOOTNOTES: CHAPTER 8

- (1) Multisystems Inc., and ATE Management & Service Co., Bus Transit Monitoring Manual, Volume 1: Data Collection Design, prepared for the U.S. Department of Transportation, Urban Mass Transportation Administration, Washington, D.C., 1981.

