BUS SHELTERS

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Prepared by

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PREFACE

This report on bus shelters was prepared by Juan O. Cruz of the Federal Highway Administration, with assistance from others in the Federal Highway Administration, the Urban Mass Transportation Administration, and the American Transit Association. It is hoped that the report will stimulate the implementation of bus shelter programs in urban areas, as perhaps another step toward promoting better utilization of our highways and streets.

The report is divided into three parts. Part I is an overview of bus shelters. It provides general information on the desirable characteristics of bus shelters. This general information should be of help to those agencies considering the installation of bus shelters. It also serves as a basic document to develop guidelines to be used in bus shelter programs.

Part II presents a summary and analysis of a survey on the experiences of the State highway agencies with bus shelters, including the problems foreseen in implementing bus shelter programs, the agencies' interest in such programs, and the availability of funds to finance such projects.

Part III presents the results of a survey on the experiences of local, public, and private transit companies in dealing with bus shelters. The companies reported on the types of shelters commonly used, materials used, size of the structures, and design and cost information when available.

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PART I: AN OVERVIEW

A. Overall Desirable Characteristics

The primary function of a bus shelter is to provide protection from the weather. This function must be carried on without compromising the safety of the passengers and with due consideration of installation and maintenance costs.

To be safe, shelters should have good visibility; they should not be hidden from the public view by placing them behind other structures. Also, the shelter sides, if the shelter is enclosed, should be of transparent or translucent material to prevent potential molesters from hiding in the shelter. The front side of the shelter should be open, but if enclosed, a minimum of two doorways or entrances should be provided to prevent persons from being trapped inside. If otherwise possible, entrances should be provided on the "house side" of the shelter (i.e., the side facing away from the street) to prevent patrons from being splashed by passing vehicles and for added safety. Doors are considered more of an inconvenience than a necessity and should not be provided.

A shelter should blend with the surroundings. It should be as attractive as possible. Although a shelter need not be a work of art, it should be aesthetically pleasing and certainly not an eyesore.

Maintenance costs are of primary concern to agencies that provide and maintain bus shelters. Therefore, to minimize these costs, shelters should be durable, of a sturdy construction, and should be built using weather-resistant, high quality materials. Also, shelters should be prefabricated in sections as much as possible to reduce "on-site" construction that may interfere with vehicular and pedestrian traffic.

Since frequent maintenance is usually associated with vandalism, shelters should be as vandal-proof as possible. Also, to reduce maintenance, shelters should be designed to provide a small opening on the sides between the top of the floor or ground and the bottom of the side panels. This opening permits circulation of air and prevents trash and other debris from accumulating against the shelter.

B. Size and Capacity of the Shelters

The size of the shelter to be provided at any one location depends primarily on the number of passengers to be served at one time. It is not practicable to provide a different size shelter at each and every location, therefore, it becomes necessary to somehow "standardize" the size of shelters. This does not mean necessarily to build all the shelters of the same size; two or more "standard" sizes can be used. To provide for variations in the shelter size within each "standard" category, shelters should be of modular design and construction. Modules can be added as needed to increase the size of the shelters.

Once the passenger demand (volume) has been estimated or determined for peak conditions from counts or surveys, the shelter size may be obtained by using a passenger floor-area factor. Values varying from 3 to 5 square feet per person have been used. These values are useful as guides, but judgment should be exercised when applying them. Unusually large shelters may result which may be impractical or uneconomical to build. Also, it appears that shelters are seldom used to capacity. There is a tendency for people to stay outside the shelter when the shelter looks "crowded."

C. Materials and Equipment

1. Materials

Bus shelters can be constructed of practically any building material available in the market. Materials that have been used in the past include; steel, aluminum, wood, concrete and tile block, reinforced concrete, fiberglass, different kinds of plastics, and glass. The choice of the materials to be used in any particular area depends on many factors such as availability and cost, workability, past experiences with the material, climate, local preference and specifications, and others. Most of the materials listed above are manufactured in standard sizes and shapes, which simplifies the design and construction of shelters using these materials. Also, these materials permit the prefabrication of shelters in sections or in one piece, a highly desirable feature.

2. Equipment

(a) Benches.--Benches can be built-in-place or prefabricated and installed after completion of the shelters. Generally, any material used for the shelter structure can also be used for the benches. Wood, however, has been the material used traditionally for its pleasing look, general availability, and relatively low cost. Other materials frequently used include steel, aluminum, fiberglass, reinforced concrete, and different kinds of plastics. These materials

are frequently used in combination. If the benches are to be attached to the structure in a cantilevered position, structural damage should be avoided through proper design of the supporting members.

(b) Police and Fire Alarms, Mail Boxes, Postal Facilities.-- These articles are normally provided and maintained by the public agencies responsible for the services related to each of them; e.g., police or fire department, post office, etc. If the facilities mentioned here are provided, they should be installed on the outside of the shelters and kept in working order.

(c) Heaters.--There are heaters available on the market that have been installed in bus shelters. Heaters are generally either gas or electrically operated. Two common types of heaters used are the thermostatically controlled units that are operated automatically and the timer-set units that operate for a set length of time, say 5 minutes, upon actuation by a push-button mechanism. Heaters may be of the kind commonly used for residential or commercial heating, such as radiant, base board, hot air, etc.

(d) Trash Receptacles.-- These articles can be very helpful in promoting cleanliness inside the shelters, but they can also cause problems if they are not properly maintained. Trash containers may be built of plastics, wood, metal, and other materials. The containers should be compact, neat looking,

and of sturdy construction. The receptacles should be tightly secured as to prevent them from overturning. Preferably they should be placed outside the shelter. Trash receptacles can be constructed by an agency's own forces or they can be purchased from the wide selection of styles and designs available commercially.

(e) Telephones.--Telephone units installed in or at bus shelters would be the usual coin-operated sets available for public use.

D. Plans and Specifications

To insure uniform quality and good workmanship, it is necessary to have a set of plans and specifications. Plans should be the typical construction sketches and drawings detailing the dimensions, sizes, and arrangement of the different parts and components. Specifications may vary depending on the type of shelter. It would be convenient to have a set of general specifications covering the overall provisions of materials and quality of workmanship applicable to all shelters. These specifications should be supplemented by more detailed specifications and provisions applicable to each individual project.

Specifications and recommendations for the installation of commercially-available shelters are usually obtainable from manufacturers and suppliers for the type of shelter that each firm provides.

Examples of specifications in use by some public and transit agencies are shown in the Appendix.

E. Shelter Location and Site Preparation

1. Location of Shelter

There are instances, such as in downtown or other built-up areas, where there is no choice as to the location of the shelter since a bus stop may have existed at the location for a long period of time and it might not be practical or desirable to relocate the bus stop. However, when conditions permit it, relocation of the bus stop should be considered if this facilitates the erection of a shelter.

Sidewalk areas where shelters are to be erected should be wide enough to minimize interference with pedestrian traffic. In narrow sidewalk areas, shelters should be modified accordingly.

2. Site Preparation

The site where the shelter is to be erected should be properly graded and drained. Most of the commercially available shelters require a paved surface that serves as floor and as foundation for anchoring the shelter. The floor should be as nearly level as possible and at the same elevation as the adjacent sidewalk area or surrounding ground for passengers' convenience and safety. Commercial manufacturers and suppliers of shelters may provide helpful recommendations about required floor and foundations for a particular type of shelter.

F. Facilities to be Provided

The kinds of facilities provided in a bus shelter may depend on the policies and on the economic and manpower capabilities of the agency responsible for the shelters. Some of the facilities most commonly provided include; benches, lighting, heat, travel information, telephone,

trash receptacles, and commercial advertising.

There are differences of opinion as to what facilities should be provided in bus shelters. Some people consider that the shelters should be the minimum facility necessary to provide protection from the weather. These people contend that shelters with too many conveniences encourage loitering and the gathering of undesirable persons, thus detracting from the main purpose of serving transit passengers. Also, it is claimed that the more facilities available the stronger the attraction to vandalism.

Other agencies assume a more optimistic approach and provide as many facilities as they reasonably can. These agencies consider that improper use of the shelters can be controlled through adequate policing and the cooperation of the public. Based on available information, there seems to be support for both positions.

When planning for the facilities to be provided in the bus shelters, consideration should be given to the maintenance problems and the susceptibility to vandalism of certain items. Availability of utility lines and possible problems in providing connection of service to the shelters should not be overlooked. Items that necessitate utility connections require careful consideration. For safety and aesthetics, utility lines should be underground. This provision of underground lines is required by many zoning regulations and building codes. Also because of safety considerations, all utility items that are exposed should be properly shielded or concealed and made tamper-proof; this applies especially to lighting fixtures and heaters.

The preceding paragraphs have covered some of the problems that are to be expected with the different facilities that are commonly provided in the shelters. The question remains then, what facilities or conveniences should be provided in the shelters? There is not a simple answer to this question. Each agency should develop its own policies and procedures regarding this matter. It is believed that the need for certain facilities will vary from city to city; even within a city, the facilities needed may vary from location to location.

1. Benches

   Benches should be provided in areas where the waiting time is long, such as at transfer points and terminal facilities. Also, benches should be available in shelters located near commercial areas to provide transit-using shoppers with a place to rest while awaiting their buses. Of special significance is the provision of benches in shelters used frequently by the physically disadvantaged or the ill (refer to the section on evaluation of the need for bus shelters).

2. Lighting

   Whenever possible, advantage should be taken of existing street and commercial lighting. This may necessitate relocation of the bus stop. Lighting becomes very necessary in dark areas and in "high-risk" areas where the personal safety of the transit riders may be in jeopardy. In providing lighting in the shelters, consideration should be given to the areas of utility connection and vandalism previously discussed. The cost of electricity

required, although probably low for each individual shelter, should also be considered. In any case, lighting should be provided only when there is reasonable assurance that the lighting system and appurtenances will be kept in working order through proper maintenance.

3. Heat

Despite the comfort that heaters provide, it may be possible that cost and maintenance problems outweigh the benefits. Heaters many times require special utility connections. The heater units are usually exposed in the shelter and may stand out obtrusively. Also, heaters, like telephones seem to attract theft and vandalism. When considering providing heat in shelters, these factors should be carefully considered.

4. Travel Information

Route maps and schedules and other similar information are very helpful to the commuter. This type of information is very desirable especially when numerous routes serve the area where the shelter is located. However, if the information is not well protected (e.g., is just pasted or taped on the walls), it gets easily destroyed or stolen. Therefore, travel information should only be provided when it can be inserted between transparent panels or when it is attached to the shelter and well protected against weather and vandalism. Condensation of moisture between wall panels may present a problem in the former situation.

5. Telephone

It appears that telephone service can be provided more effectively elsewhere than in bus shelters. Should it become necessary to install telephones, they should be located on the outside of the shelters. Telephones will attract nontransit users to the shelter and may interfere with the flow of passengers to and from the buses. Installation of public telephones inside the shelters should, therefore, be strongly discouraged.

6. Advertising and Other Commercial Activities

A shelter should be provided solely to serve transit passengers. Any other activity which may detract from this purpose should not be permitted. Commercial advertising, posting of bills, and vending machines do not normally belong in a bus shelter. These activities may create discomfort and annoyance among transit users and in the long run may be counteractive. Agencies contemplating the sale of commercial advertising space on their shelters should check for possible conflicts with existing laws, ordinances, and regulations. Commercial advertising on shelters located on highways that are part of the Federal-aid system must be approved by the Federal Highway Administration, as provided in subsection (c) of Section 1.23 of Title 23, Code of Federal Regulations.

G. Evaluation of Bus Shelter Projects

1. Factors to be Considered

Bus shelters provide users with comfort and protection from the weather. Shelters should be located in areas where the magnitude

of transit service and environmental conditions warrant the expenditure of funds. The following factors should be considered when evaluating the need for bus shelters.

(a) Climatological Conditions.--Areas of subfreezing temperatures for extended periods of time and areas of frequent precipitation should be given primary consideration, especially in those areas where strong, gusty winds worsen the situation. Areas where only protection from the sunlight is sought may require a lesser type of shelter. Documentation for bus shelter projects should include information on weather conditions.

(b) Passenger Volume.--The number of persons expected to use the shelters is an important measure of the need for shelters. The demand for shelter use will normally be greater during commuter peak hours.

An example of a good approach used in evaluating passenger volumes is presented in a study conducted by the Connecticut Department of Transportation.[1/] The method consists of taking passenger counts at bus stops for every "waiting period" between bus arrivals. The data thus obtained, usually during peak hours are plotted on a graph for each location with "Time of Day" as the abscissa and "Number of

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1/ New Haven TOPICS-Bus Shelter Program by the Connecticut Department of Transportation.

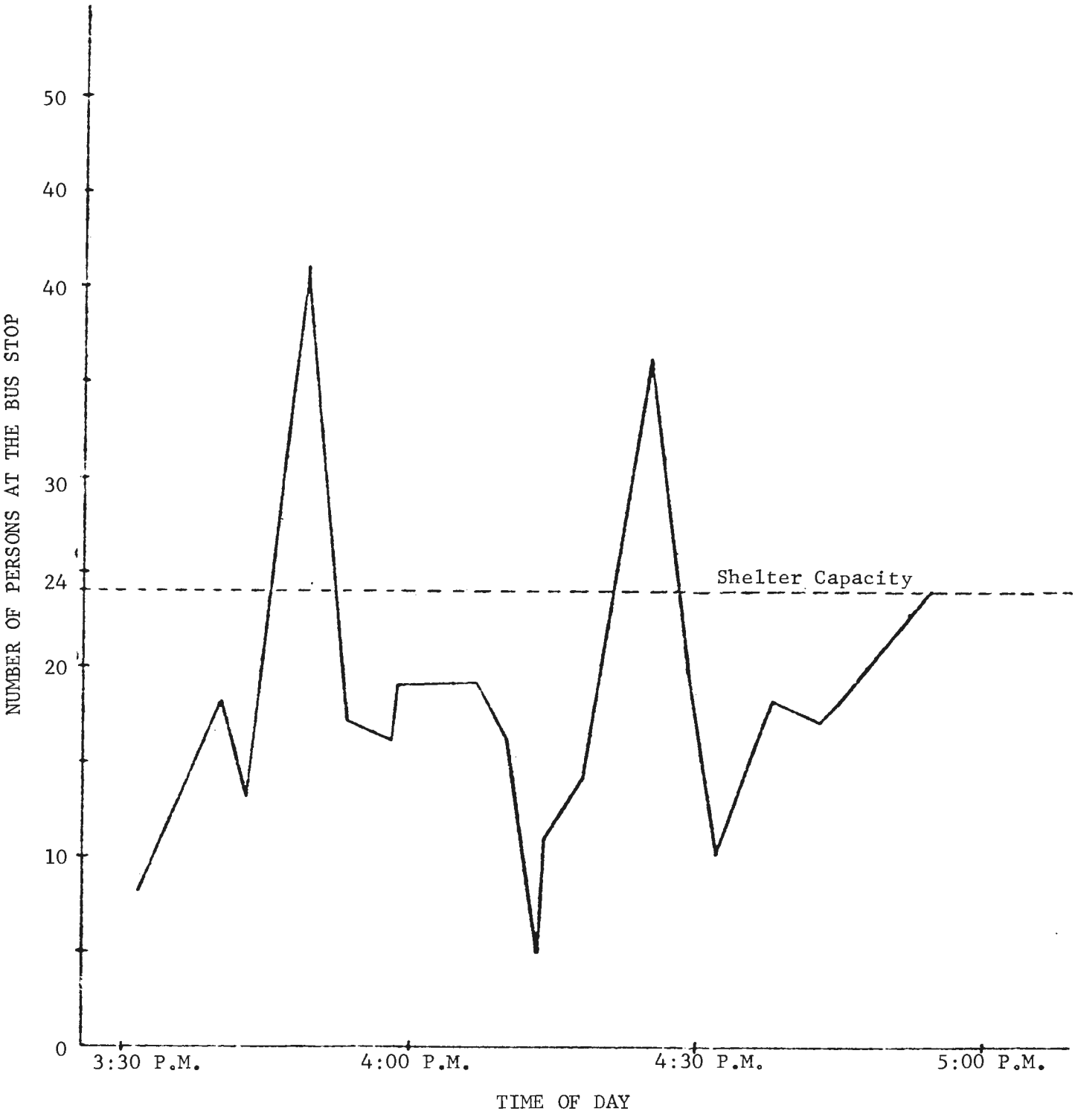

Figure 1.--Patronage Distribution at a Bus Stop
Location: Westside Temple Street, North of Chapel Street, City of New Haven, Connecticut*

* New Haven TOPICS, opp. cit.

Persons at the Bus Stop" as the ordinate. By plotting the capacity of shelters represented by horizontal lines, it is possible to compare the demand with the capacity and the length of time the capacity is exceeded.

Since the loading conditions represented in the graphs are for short periods of time, it is possible to balance tradeoffs between costs and benefits of satisfying peak loads. Figure 1 is an example of one of the graphs developed for one of the locations studied in Connecticut.

(c) Special Considerations.--There are locations where bus shelters may be required to provide service and protection to the physically disadvantaged, such as the aged, the sick, and the handicapped. Locations where these persons are likely to wait for public transportation include areas near hospitals, residences for the aged, or the handicapped, sanatoriums, nursing homes, etc.

When shelters are provided near these places, consideration should be given to special features or facilities that may be required such as wide entrances and ramped curbs for wheelchairs.

(d) Other Factors.--In addition to the factors listed above, there are other factors that should be included in establishing bus shelter needs. For instance, in congested downtown business districts isolating passengers from pedestrians may speed up boarding of buses. Shelters may also ease problems

with passengers blocking store fronts and street cross-walks.

The factors discussed above are not necessarily listed in order of importance. As a matter of fact, in some instances one of the factors might outweigh the others in such a way that it could be the determinant factor in justifying the need for a bus shelter.

2. Economic Analysis

A useful means for evaluating bus shelter projects is by making an economic analysis. One approach consists of determining the equivalent annual cost of a bus shelter and comparing this with the estimated annual benefits. For example, assume that the initial cost of a shelter (I) is $3,000 including installation. The life expectancy of a shelter (N) is from 10 years to 20 years, so an average service life of 15 years might be used. To account for the cost of the capital investment, a discount rate of 10 percent is assumed. This rate is usually a matter of subjective judgment with values between 6 percent and 12 percent used frequently. Present value factors (PVF) can be obtained from interest tables. For a 10 percent rate and a 15-year period, this factor is 7.606080. An average annual maintenance cost (M) of $150 appears reasonable. This amount should provide for routine clean-ups plus the cost of repairing or replacing damaged parts of the structure.

From the above data, the equivalent annual cost (EAC) of the shelters is computed as follows:

$$EAC = \frac{\text{Initial Cost (I)}}{\text{Present Value Factor (PVF)}} + \text{Annual Maintenance Cost (M)}$$

Solving the equation provides a value of $544. That is to say, the discounted annual cost of the shelter being considered is $544.

The determination of the estimated annual benefits (EAB), while straight forward, is entirely dependent on the monetary value that is used for the time a person spends getting the protection offered by the shelter. The estimated annual benefits can be computed as follows:

EAB = P x D x T x V

Where: P = Number of passengers per day using the shelter

D = Number of days per year of inclement weather (i.e., rain, snow, cold wind, hot sun)

T = Average waiting time per person in hours

V = Dollar value per hour for protection from inclement weather

If it is assumed that P is only 50 persons per day, that D is 50 days per year of rain, snow, cold wind, and hot sun, that T is 1/6 (a waiting time of 10 minutes), and that V is only $2.50 per person-hour of protection from inclement weather, then the annual benefits would be $1,042 per year.

As can be seen, this estimate of annual benefit compared to the estimate of annual cost produces a benefit cost ratio on the order of two, even under very conservative assumptions of usage. It is obvious that a more favorable benefit cost ratio would be obtained for most instances where shelters might be considered.

H. Compliance with Ordinances and Regulations - Agreements and Permits

Shelters are normally erected within public rights-of-way and as such are subject to regulations and ordinances promulgated by the agencies controlling them. The applicable regulations and ordinances may require permits; they may also specify certain conditions under which shelters would be permitted. In some instances, it may also be necessary to obtain approval or easements from affected private property owners. These legal implications and any necessary permits should be studied and analyzed before undertaking the construction of bus shelters.

An example of a State's policy regarding permission for installation of bus shelters on State highway rights-of-way is shown on page A-10.

I. Commercially Manufactured or In-House Produced Shelters?

When considering providing bus shelters, an agency has to decide between designing its own shelters or buying commercially produced ones and between erecting the shelters with its own forces or letting contracts for this work. The decision as to which course of action to follow will depend generally on the financial and manpower capabilities of the agency. Of relative importance are also the number and location of the shelters to be constructed, the local availability of materials, and the degree of complexity of the project to be undertaken.

If an agency decides to design its shelters, careful planning is essential. Consideration should be given to the aspects previously discussed; namely, materials to be used and their availability and cost; size of the structures, location, conveniences to be provided, local regulations, ordinances, permits, agreements, etc.

In-house design of the shelters has the advantage of allowing greater flexibility to adapt the design to local conditions and situations. This flexibility invites creativity and a "local touch" in the design; however, it could also add considerably to the construction cost of the shelters if extravagant designs result. In-house designs that utilize material of standard structural shapes and sizes for the shelter components may make possible large scale production of shop-fabricated structures at a lower unit cost.

Should the decision be made to obtain commercially-produced shelters, there are numerous manufacturers from which to select. Because of the regional variation in climate, materials and labor costs, these commercial sources should be contacted for additional information as to shelter specifications, pricing, and availability.

The majority of the shelters available provide or can be modified to provide most of the qualities and conveniences desired. These shelters are available in a wide range of styles, sizes, and materials to suit practically any need, with prices that vary accordingly.

Some manufacturers also provide delivery and installation services within reasonable distance of their shops as part of a package deal. It may also be possible to purchase the shelters in preassembled sections for installation by the purchaser's own forces or by separate contract.

When considering purchasing of commercial shelters, all the alternatives should be considered.

Photographs and sketches of some types of shelters provided by transit companies and public agencies are shown in the Appendix. Also included in the Appendix are a few photographs of commercially-produced bus shelters.

J. Public and Community Involvement in Bus Shelter Programs

Shelters are provided to serve the public; therefore, it is important to arouse public awareness. Public participation in shelter programs should not be limited to their use of these facilities.

In the past, some cities and transit companies have benefited from the participation of groups and organizations in projects providing for the construction of bus shelters. Organizations such as neighborhood associations, civic associations, senior citizen groups, garden clubs, cultural organizations, and others can provide financial and maintenance assistance as well as valuable input in the planning, design, and development of bus shelters for the community. These types of organizations, because of vested interest or altruistic purposes, may be willing to lend their cooperation and support in providing bus shelters. These are sources that should be tapped. Participation by these organizations is usually limited to just a few shelters per sponsor. If, however, several sponsors participate in a program to provide and/or upkeep the shelters, the benefits accrued can indeed be substantial.

PART II: SURVEY OF STATES' EXPERIENCES

A. Introduction

The use of Federal-aid highway funds for bus shelters is permitted under section 111 of the 1970 Federal-Aid Highway Act. To obtain background information on the States' experiences with bus shelter programs and projects, information was gathered by the Federal Highway Administration (FHWA) field offices, as requested in an FHWA Notice dated December 22, 1971. A copy of the Notice is shown in the Appendix.

A total of 45 replies was received. This part of the report presents a summary and discussion of the five items on which information was received: (1) past experiences with projects involving shelters; (2) problems foreseen in administering projects; (3) attitudes toward implementing projects; (4) availability of funds; and (5) other comments and recommendations.

B. States' Experiences

The States' experiences with shelters were divided into three categories of experience: None, Little, and Extensive. The results are shown in table II-1.

The table shows that the vast majority (80 percent) of the States did not have any experience whatsoever with bus shelters. Another 18 percent of the States indicated having had little or some experience. Only one State indicated that it was involved extensively in bus shelter projects.

Table II-1.--Extent of States' Experiences with Bus Shelters

Experience	Number of States	Percent of Total
None	36	80
Little	8	18
Extensive	1	2
Total	45	100

The lack of State highway agencies' involvement with bus shelters (and other highway-related mass transportation facilities for that matter) may be due in part to the traditional position of disassociation between these agencies and mass transportation systems. Fortunately, this gap is being bridged effectively with the increasing involvement of State highway agencies in plans for the preferential treatment of buses, the emergence of more and more State Departments of Transportation, and better coordination between modal agencies at all levels of government.

C. Problems Foreseen in Administering Projects

The replies to this question may be indicative of the areas that need special attention when developing or planning bus shelter projects. Sixty-six replies were received since many States listed several potential problem areas. Of the 66 replies, 13 indicated that no problems were foreseen in implementing bus shelter projects.

Of the 53 replies indicating some types of problems, those associated with maintenance of the shelters and with liability topped the list with 11 responses for each. Coordination with municipalities and other

agencies was next on the list being reported in six instances, followed closely by problems related to right-of-way acquisition which were included five times. Vandalism and legal problems were mentioned four times each. The relatively low ranking of vandalism as a problem agrees with the findings of the survey of transit companies (see Part III) and appears to reaffirm the fact that, contrary to general belief, vandalism may not be a widespread, serious problem.

Of the other problems mentioned, the most significant was that of bus companies possibly going out of business due to decrease in ridership and the precarious financial situation of the companies. The remaining problems mentioned were cost, the relocation of bus stops caused by shelter location, utilities, lead time necessary to implement projects, physical location of the shelters, and aesthetics. Table II-2 shows the type of problems expected to develop ranked by the number of times each problem was mentioned.

Table II-2.--Types of Problems

Type of Problem	Number of Times Reported
None	13
Maintenance	11
Liability	11
Coordination with Other Agencies	6
Right-of-Way Acquisition	5
Legal Matters	4
Vandalism	4
Cost	3
Bus Companies going out of Business	3
Location of Shelters	2
Relocation of Bus Stops	1
Lead Time Needed	1
Aesthetics	1
Utilities	1
Total	66

D. Attitudes Toward Implementing Projects

If bus shelter projects are to be undertaken at the State level, it is desirable to have an idea of the State agencies' interest and attitudes toward these projects. The replies received to this question were not always definite. The replies were, therefore, grouped arbitrarily into four categories depending on the way they were worded. The four categories were; (1) interested or favorable attitude, (2) favorable with reservations, (3) not interested or indifferent, and (4) no reply indicated. Category (2) includes those States that expressed a favorable attitude toward implementing bus shelter projects but which indicated reasons for not considering such projects in the immediate future. Some of the reasons given were lack of funds, other priorities, no pressing need for shelters at the moment, and lack of significant bus transit system operating in the State. The replies are summarized in table II-3.

Table II-3.--Attitude Toward Bus Shelter Projects

Attitude	Number of States	Percent
Interested or Favorable	20	45
Favorable with Reservations	11	24
Not Interested or Indifferent	8	18
No Reply Given	6	13
Totals	45	100

The results indicate that 31 of the 45 State agencies (69 percent) are interested in bus shelters or have a favorable reaction even though there were reservations expressed.

E. Availability of Funds

Any projects providing for the installation of bus shelters would, of course, require the expenditure of funds. Information was gathered on the availability of such funds. The replies from a given State could be tied to some extent to that State's attitude toward bus shelter projects as previously reported under item 3. The responses to the question on availability of funds are summarized in table II-4.

Table II-4.--Summary on Reported Availability of Funds

Funds	Number of States	Percent
Available without Conditions	7	16
Available with Some Restrictions	7	16
Not Available	11	24
Not Permitted by Law	4	9
Not Reported	16	35
Total	45	100

As shown in table II-4, the States were almost equally divided into those indicating that funds were available and those indicating that funds were not available.

Of those that indicated that funds would be available only with some restrictions or under certain circumstances, the restrictions mentioned included the use of only certain types of State or Federal funds such

as TOPICS or of other Federal-aid funds specifically designated for mass transit facilities.

There seemed to be some reluctance on the part of some of the States to comment on the use of Federal-aid highway funds for projects such as bus shelters, even when the States favored the undertaking of such projects. It was indicated that existing and projected highway needs and the required monies to meet these needs would preclude the use of regular highway funds for bus shelter purposes. The fact that 16 responses (35 percent) did not indicate whether funds would be available or not, may indicate an unwillingness to push for involvement in the provision of bus shelters with State funds.

F. Other Comments and Recommendations

In addition to the four major items of information discussed above, additional comments and recommendations were requested on any matters pertaining to bus shelter projects. The comments submitted generally elaborated on or discussed in further detail some of the items reported. Some of the replies appeared vague and noncommittal; some other replies presented contradictory statements.

Some of the comments made reflected an apathy toward mass transportation improvements. Also, some of the comments expressed rather pessimistic views about the eventual benefits of providing bus shelters. On the positive side, it was encouraging to note that two States reported that legislation similar to that in the 1970 Federal-Aid Highway Act had been recently passed or was pending that would permit the use of highway funds for mass transportation facilities such as bus shelters.

Two States expressed interest in receiving general information on bus shelters. Some of the typical, more interesting points of views expressed were as follows:

- Bus companies and transit authorities should be responsible for bus shelters.
- Benefits would accrue to others, shelters do not warrant expenditures.
- Why take on a new burden.
- Very limited or no mass transit systems in use.
- There are other priorities.
- Policing and maintenance should be the responsibility of local governments.
- Local governments have not indicated desirability for, and feasibility of, bus shelters.
- Warrants for shelters should be formulated.
- Bus transit would be the only acceptable form of mass transit.
- Applications from all cities should be combined into one project.
- Would use only TOPICS or special funds.
- Legal aspects need checking.

G. Summary

This section presents a summary of the most significant findings of the survey. It is worth noting that the information gathered in the survey was based on opinions, general attitude, and feelings of the

State highway departments toward the implementation of bus shelter programs. Since the points of view expressed are subject to change, any conclusions reached are reflective of the conditions at the time the survey was made.

The following are the most significant findings:

1. The majority of the States have had no experience with bus shelter programs. However, there was an expressed interest on the part of many States to participate to some extent in bus shelter programs (see item 3 below).
2. Of the problems that could be expected in administering bus shelter projects, maintenance of the structures and liability were mentioned as the most likely to occur. The problems mentioned do not appear very serious. In many cases, it appeared that the problems expected to develop would be mostly because of the lack of experience in dealing with bus shelters rather than because of limitations in the States' capabilities to handle such problems.
3. A relatively large number of States indicated interest and willingness to undertake projects for the provision of bus shelters. However, some reservations were expressed by some States because of shortage of funds and because of possible legal restrictions in using highway monies for what might be considered as nonhighway facilities such as bus shelters (see item 4).
4. About one-third of the States' reporting information indicated that State monies would be available for financing bus shelter projects; however, several of the States noted that funds would

be available only under certain circumstances. It appears that there would be more willingness on the part of the States to participate in the financing of bus shelters if Federal funds were available from sources other than regular highway appropriations.

5. A few States appeared reluctant to get involved in bus shelter projects.

PART III: SURVEY OF TRANSIT COMPANIES' EXPERIENCES

A. Introduction

A survey was conducted of transit companies to obtain information on the physical characteristics of the bus shelters more commonly in use in the urban areas served by bus transit. The survey also provided information on the financing, maintenance, availability of bus shelters, and the status of bus shelter programs in the cities served by the transit companies.

With the cooperation of the American Transit Association (ATA), a questionnaire was mailed to about 230 transit companies. A total of 42 questionnaires was returned by bus transit companies operating in the United States. Five Canadian companies and one domestic railway company also returned the questionnaire, but data from these companies were not included in the summary and analysis since these data are not pertinent to the study. A sample copy of the questionnaire is shown in the Appendix.

Because of the variety of design and construction materials, and all the other variables considered, it is not possible to determine a profile of what could be termed a "typical" shelter. However, from the information obtained, a "probable" shelter might be described as follows:

The shelter will probably be from 5 feet to 7 feet in width, over 10 feet in length, and over 7 feet in height. Chances are that the shelter will be built with a metal frame. It will have either a metal or a plastic roof. The shelter sides will either be open or of a transparent siding with glass or plastic panels. Fifty percent of the

time the shelter will include benches, and sometimes it will also include travel information and be lighted. It will have the same probability of being of a standard design as of a design which will vary with location. The shelter will not be vandalized frequently; and if it is vandalized in all likelihood the shelter is located at or near a school.

Although not obtained from the survey, it is almost certain that at least one person is very much appreciative of having a bus shelter at his bus stop: Mr. Commuter.

B. Response to Questionnaire

The response rate is rather low (18 percent) and it could be argued that inferences from the data may not be valid or significant. However, the 36 domestic companies that responded did represent a cross section of bus transit operations serving small and large urban areas across the country. It is also considered that the data obtained present a realistic picture of the types of bus shelters and the extent of bus shelter programs existing in our urban areas.

The questionnaire did not ask for information on the number of shelters in service in each city. Some of the replies included this information, usually to indicate that only a small number (as low as one) of shelters was available in their area. Also several bus transit companies indicated that a program to provide bus shelters was being contemplated in the near future.

It should be noted that whenever a company provided more than one reply to any item, each reply was considered separately for the purpose of this summary and analysis. Therefore, in some instances the number of replies may be numerically larger than the number of companies replying.

C. Shelter Availability, Maintenance, and Financing

Of the 36 domestic transit companies replying, 14 do not provide bus shelters at the present time and 22 provide some type of shelter, although not necessarily at all locations. Twenty-two replies were received to the question about the entity responsible for the care and maintenance of the shelters. Of the 22, 10 indicated that the transit company is responsible for the maintenance, 5 indicated the city as responsible, and 2 indicated joint responsibility between the city and the transit company. In 3 instances, private groups or organizations provide maintenance services. Of the remaining 2 companies, 1 reported that a citizens group takes care of the structures and the other stated that a public agency provides the required maintenance. It should be noted that in some instances only a few shelters are involved.

There were 19 companies reporting on the financing of the bus shelters. In 8 of the cities, the transit companies provided all the funds for the shelters. Municipalities provided financing, either in total or in part in 4 cities. In 3 cities, the financing was provided by a combination of agencies other than the transit company or the city. Civic groups or associations financed the shelters in one city. The financing of shelters in the remaining 3 cities was provided by a private or public agency. The variety of financial sources that have been used in funding bus shelters is indicative of the interest taken in this type of project by the different sectors of the community: private, public, business, and civic organizations.

D. Experience with Vandalism

In addition to the information on maintenance responsibility, information was also obtained concerning the transit companies' experiences with vandalism of the shelters. It is somewhat surprising that of the 17 companies reporting, the vast majority (14 of them) reported that acts of vandalism were infrequent. Only 3 companies indicated a high incidence of vandalism. One company reported having no experience with shelter vandalism as of yet, since its shelters had been recently erected.

The relatively small number of companies experiencing frequent vandalism of the shelters seems to overthrow the contentions and concern commonly expressed that installation of shelters will become a continual maintenance headache. Of course, some degree of vandalism is to be expected on any facilities used by the public. Some acts of vandalism, such as spray painting and graffiti, may be difficult to prevent and may require good policing and campaigns appealing to the citizenry for their cooperation in preserving the shelters.

Of the five agencies identifying the locations where vandalism is more prevalent, all indicated that the shelters located at or near schools are the most frequently vandalized. One of the five agencies reported "near parks" as well as near schools as the locations where vandalism of shelters was more frequent. Based on the reported experences, it appears that special consideration should be given to the design and construction of bus shelters in these areas.

E. Shelter Size

Concerning the physical characteristics of the bus shelters, the following was learned.

1. Length - Nearly 2/3 (17 out of 26) of the agencies reporting on this item indicated that the shelters in use are over 10 feet in length. Of these 17 agencies, 8 indicated having shelters over 12 feet long and 9 indicated having shelters of between 10 feet and 12 feet in length. No agency reported having shelters less than 6 feet in length.

2. Width (depth) - There were agencies reporting shelter widths in each of the size categories listed (see the Appendix). There is no predominant width reported. There were 25 replies to this item. The size range reported the most was "5 ft. - 7 ft." in 11 of the replies. On the upper and lower categories of width, only one agency indicated use of shelters over 11 feet, probably "fully-sided" shelters; and 5 replies indicated use of shelters of less than 5 feet in width, probably of the "partially-sided" type.

3. Height - A total of 20 replies was received to this item. Of these replies, 15 reported heights of over 7 feet. Shelters over 7.5 feet in height were reported in 7 instances, that is, in 35 percent of all the replies.

F. Construction Materials

1. Structural frame - Replies to this item totalled 25. Metal (aluminum and steel) is by far the most frequently used material. Nineteen agencies reported using metal frames, 11 of them indicated use of aluminum frames, and the other

8 reported using steel. Of the remaining 6 agencies replying, 4 reported "wood" and 2 mentioned "other materials" as the principal material used for the structural frame.

2. Siding - This item refers to the extent to which the shelters are enclosed and the materials used to fully or partially close the sides of the shelters. Of the 23 companies that reported data, 8 companies (about 35 percent) reported using open-sided shelters and 15 companies reported that some sort of siding is provided. Of the latter 15 companies, 8 reported using acrylic or policarbonate plastic (commonly referred to by their trade names of "Plexiglass" and "Lexan" respectively) siding, 2 utilized glass, 4 used a combination of materials, and 2 reported using "other" kinds of materials. The degree to which siding is provided on a shelter is often dependent on factors such as prevailing weather, site restrictions (e.g., narrow sidewalks), zoning regulations, and other considerations.

3. Roof - Of the 19 companies replying to this item, 6 indicated that some type of plastic material is used for the shelter roof, 5 indicated aluminum as the material used, 3 reported wood with some type of cover, and the other 5 agencies reported using either a combination of materials or other materials such as concrete or fiberglass.

G. Facilities Provided

Counting each facility reported as a reply, there were 28 replies to this item. In addition, two agencies reported on the item but did not provide a specific breakdown of the facilities provided. Of the 28 replies, 14 (50 percent) indicated that benches are provided in the shelters. Seven replies were for travel information provided. Of the remaining 7 replies, 5 indicated that lighting is provided in the shelter and 2 reported that heat is included in the shelters. Obviously, some of the shelters will provide more than one of the items.

H. Design and Construction

There were 22 agencies reporting on this item. Eight agencies indicated that their shelters are designed and constructed by either the city or the transit company. Nine agencies reported that their shelters are obtained from commercial sources with installation done by either the transit agency or a contractor. Three agencies indicated that their shelters were designed by consultants; these shelters were of a special design for special projects. One agency reported that a civic group provided and erected its few shelters.

With regard to the type of design, 7 agencies reported that they use a standard type of shelter; that is, the same design at all locations. Another 7 agencies indicated that they vary the design depending on location and other factors. The design type refers to the configuration and architectural characteristics of the shelters and not to their size and capacity.

I. Cost

Sixteen agencies reported on the average cost of shelters. One other agency reported a price range, but these values were not included with the rest for analysis purposes. Of the 16 agencies reporting, 13 indicated a cost of less than $2,000 per shelter. Two agencies reported a unit cost of between $2,000-$3,000. The remaining agency reported a cost of over $5,000 per shelter, but it should be noted that this cost was for only one shelter of special design. There were 5 agencies reporting a cost of under $1,000 per shelter.

As with the design and construction of shelters, there are too many variables involved or not enough information available to categorize the cost of providing bus shelters for any specific conditions. However, it appears that there exists enough variety in design, construction, and cost of shelters to meet the needs of most locations.

J. Summary

The percentage of questionnaires returned was not high enough to arrive at indisputable conclusions. Nevertheless, based on the information obtained, the following highlights and conclusions are presented.

1. Over one-third of the transit companies responding to the questionnaire indicated that they do not provide any kind of bus shelters. Many of the shelters provided have been furnished by private or public organizations. See also item 4.

2. There is a great variety of shelter types, sizes, and of materials used in the construction of shelters. Frequently, the shelters are designed and constructed by the transit agencies, but the shelters are also commonly obtained from commercial sources.

3. Despite general belief that shelters are vandalism-prone, it was reported by most agencies that their shelters were subject to little vandalism. Shelters at or near schools are the most susceptable to vandalism.

4. Private and civic groups and organizations have participated actively in bus shelter programs. These are sources that should be explored by transit agencies considering providing bus shelters.

5. The cost of each shelter provided varied with the design and construction but the majority of shelters were reported to cost under $2,000.

APPENDIX

EXAMPLES OF SPECIFICATIONS

Because of the many different specifications for bus shelters that may be in use to date, it would not be practical to include any one set as being "typical." Also, there are certain conditions and requirements in the specifications in use by one agency that would not be applicable to other localities. Therefore, this appendix includes only excerpts from sections of a few specifications which are considered of general interest to any area or to any agency.

The example specifications included in this appendix are for information and illustrative purposes only and do not imply approval by the Federal Highway Administration of the materials, methods, and trade names that might be included in these examples.

EXAMPLE NO. 1 - Specifications of the New York Department of Transportation

SECTION 1 - GENERAL PROVISIONS

1-1. DESCRIPTION OF WORK:

The Contractor shall furnish all equipment, materials, and labor necessary to fabricate and erect the shelter shown on the plans at the locations specified in the contract.

1-2. STANDARD MATERIAL AND CONSTRUCTION SPECIFICATIONS:

The current specifications of the American Society of Testing Materials, the American Welding Society, and the American Concrete Institute shall apply where applicable.

1-5. MATERIAL REFERRED TO BY NAME:

Special reference in the specifications or drawings to any material or product by name or make shall be interpreted as establishing a standard quality and shall not be construed as limiting competition, and the Contractor in such cases may at his option use any material or product which in the judgment of the owning agency is equal to that named.

1-6. ACCURACY OF INFORMATION MADE AVAILABLE TO CONTRACTOR:

Any information concerning subsurface material or underground utilities made available to the Contractor by the Municipality or by the State is not intended as a guaranteed accurate representation but is furnished for information only. It is expressly understood that the State or Municipality will not be responsible for the accuracy thereof or for any deduction, interpretation, or conclusion drawn therefrom by the Contractor. The information is made available in order that the Contractor may have ready access to the same information available to the State or Municipality and is not part of this contract.

1-18. SUPERVISION

General supervision for shelter installation will be the responsibility of the Contractor. A representative of the owning agency will inspect each installation to determine compliance with this specification.

SECTION 2 - MATERIALS

2-1. GENERAL:

Materials shall meet the current requirements of the American Society of Testing Materials, the American Welding Society, and the American Concrete Institute.

2-6. GLAZING:

Wall panels shall be glazed with clear 3/16" thick "Lexan" or similar, polycarbonate sheeting, coated on both sides with "Abcite" or similar equal abrasion resistant coating. All materials shall be first grade and masked on both sides. Masking shall not be removed until panels are to be glazed.

2-7. SKYLIGHT DOMES:

Skylight domes shall be white translucent acyrlic.

SECTION 3 - DESCRIPTION OF WORK

3-1. POSTS:

Posts shall be stainless steel of formed welded or tubular construction. Provide posts with stainless steel anchor plates, attachment clips and holes as indicated on drawings or as modified by bidder and approved by the owning agency. The sizes, shapes, and methods of anchoring posts and attaching to framing members and sills shall be as indicated on drawings or as modified by bidder and approved by the owning agency. Attachment clips shall be stainless steel welded or mechanically fastened to posts.

3-8. GLAZING OF WALL UNIT:

Window panel shall be designed to receive polycarbonate sheet of thickness specified. Installation of polycarbonate sheet shall be performed in the shop. The acrylic sheets shall be secured with removable metal glazing beads. Metal glazing beads shall be stainless steel, designed for use with glazing tapes or with flexible glazing channels. They shall be either a snap-on type of a manufacturer's standard design or fastened with stainless steel bolts or self-tapping screws of proper size for the light thickness specified. Beads and/or gaskets shall be carefully fitted by mitering or coping at corners to produce neat and attractive joints. Glazing materials shall be either special shaped gaskets or tapes. No wet glazing compounds will be accepted.

SECTION 4 - FABRICATION AND ERECTION

Finished work shall be rigid, neat in appearance and free from defects. Shapes shall be accurately formed to required sizes and profiles. Joints shall be carefully fitted and welded or secured mechanically to form a tight joint. Wherever possible, welding should be done from an unexposed side. Neat and accurately applied exposed welds will be accepted in certain locations; otherwise grinding, dressing, and blending with adjacent finish will be necessary.

Sharp corners of metal components must be removed to prevent personal injury and damage to clothing. Exposed fasteners will be permitted only in inconspicious locations.

The Contractor shall take accurate field measurements prior to preparing shop drawings so that adequate provision may be made to adjust for variation in elevation of existing sidewalk at base of posts.

Anchor studs shall be accurately set by means of template. Studs may be set by placing in fresh concrete or by use of expansion bolts.

Structure shall be erected true and level. Leveling may be accomplished by use of shims, or by pouring top of column pier foundation to proper elevation, or by use of the Alternate Post Base Assembly detailed on Drawing No. 2, or by any other approved method. Shims, if used, shall be steel, galvanized or stainless, of the same dimensions as the base plate.

SECTION 5 - MEASUREMENT AND PAYMENT

The prospective bidders shall submit a unit price per shelter. The Contractor shall be paid his price bid for each shelter fabricated and erected in accordance with the plans and specifications.

The unit price per shelter shall include furnishing all labor, material, and equipment necessary to complete the work.

EXAMPLE NO. 2 - Specifications of the Connecticut Department of Transportation for the Shelters Installed in the City of New Haven

Materials

All structural frame and window frame members shall be extruded alluminum of 6063-T52 alloy. Structural framing shall be $2\frac{1}{2}$"by $2\frac{1}{2}$" hollow aluminum tube of .125" thickness. Window frame shall be "F" shaped, self-aligning sections of 3/16" thickness, with integral slots for corner keys as shown on detail drawings. Corner keys shall be cast aluminum "L's" with 1/8" threaded screws for fastening to window frame sections. Mullions shall be $1\frac{1}{2}$" by $2\frac{1}{2}$" hollow aluminum tube sections, of .125" thickness. Facias shall be extruded aluminum section

with integral gutter, rain drip, and weep holes cantilevered beyond face of glazing panels below, as shown on detail drawings.

All aluminum shall conform to the standards of the Aluminum Association, 215 Lexington Avenue, New York, New York.

Construction

Framing shall be of $2\frac{1}{2}$" by $2\frac{1}{2}$" by 1/8" structural extruded tubes. Connections shall be by means of extruded aluminum channels, $2\frac{1}{4}$" by $2\frac{1}{4}$" by $2\frac{1}{4}$" high or $1\frac{1}{4}$" by $2\frac{1}{4}$" by $2\frac{1}{4}$" high, as shown on detail drawings; fasteners shall be by means of high strength stainless steel bolts of $\frac{1}{4}$" diameter, with washer and nuts, and $\frac{1}{4}$" countersunk aluminum rivets. All structural frame connections shall be concealed. Connection at base shall be by means of internal channel connector ($2\frac{1}{4}$" by $2\frac{1}{4}$" by $2\frac{1}{4}$", $\frac{1}{4}$" thickness), $\frac{1}{2}$" stainless steel expansion bolt at each vertical post, and $\frac{1}{4}$" aluminum rivets as shown on detail drawings. Bases shall be adjustable to varying sidewalk conditions (or mounting conditions). Window frames shall be affixed to shelter frame with 3/16" shallow head aluminum rivets, at $13\frac{1}{4}$" o.c. Facias and window frames shall have mitered corners; connections with corner keys and threaded screws as shown on drawings. Additional rigidity of facia shall be by lapping corners of roof fastening plat across mitered joint and fastening through roof frame on both sides of joint.

Finish

All aluminum shall be anodized with a one (1) hour 215 R-1 "dip" minimum, to conform to "Aluminum Association Standards for Anodically Coated Aluminum Alloys for Architectural Applications." The complete shelter, facias and structure, shall have 313 S Dark Bronze Duranodic finish which shall conform to the standards of the Aluminum Company of America.

Glazing

All glazing shall be $\frac{1}{4}$" nominal Solar Control Bronze Plexiglas. The gaskets around the windows shall be extruded Polyvinyl Chloride PVC dry set splines, as shown on the detail drawings.

Roof

The roof shall be one piece molded plexiglas skylight "dome." The thickness of the plexiglas shall be $\frac{1}{4}$" nominal and the color shall be Solar Control Bronze. The roof shall be completely enclosed by compressed gaskets of expanded Neoprene, SCE41, adhesive backed sandwich panel as shown on the detail drawings, and shall be leak and condensation proof.

Installation

The bus shelter shall be assembled according to the manufacturer's instructions and shop drawings. The shelters shall be installed at the locations and in the orientations shown on the plans.

Method of Measurement

The quantity to be paid for under this item will be the number of completed, installed, and accepted bus shelters of the type specified.

Basis of Payment

This work will be paid for at the contract unit price each for "Bus Shelter" of the model specified, which price shall include assembly of the shelter, drilling of anchor bolt holes in the concrete slab or sidewalk, grouting, installation of the bus shelter and all materials, equipment, tools, and labor incidental thereto.

EXAMPLE NO. 3 - Specifications of the City of Detroit

SECTION 2 - GENERAL DESCRIPTION AND SPECIFICATIONS

2.2 - The shelter as specified will be prefabricated, assembled, and erected as a complete unit by the Contractor. Erection shall be done at predetermined sites and according to a schedule provided by the city of Detroit and mutually agreeable to the Contractor and the city of Detroit. Site preparation including all necessary concrete work shall be the responsibility of others and is not to be included in this bid.

2.3 - Labor for field installation of these shelters will be furnished by the Contractor.

2.4 - General supervision for shelter installation will be the responsibility of the Contractor. A representative of the city of Detroit will inspect each installation to determine compliance with this specification.

SECTION 3 - SCOPE OF WORK

3.1 - EXTENT

The work required under this specification shall consist of furnishing all stainless steel, galvanized steel, and related items necessary to construct and erect bus shelters in general conformity with design drawings submitted and further described in these specifications.

SECTION 5

5.9 - SEATS AND BACK RESTS

Seats and back rests shall be of kiln dried maple.

5.10 - WALL UNITS

Frame and mullions shall be of hollow formed stainless steel construction with corners and other joints permanently secured to form a rigid frame. Design of frame should provide for ease of attachment to or removal from posts and permit interchangeability. Fixed and removable glazing stops shall be provided to receive glass, acrylic sheet, or metal insert panels as specified.

5.11 - GLAZING OF WALL UNIT

Window panel shall be designed to receive glass or acrylic sheet of thickness specified. Installation of lights shall be performed in the shop. The lights shall be secured with removable metal glazing beads.

POLICY ON INSTALLATION OF BUS SHELTERS AND BENCHES BY CIVIC ORGANIZATIONS WITHIN HIGHWAY RIGHT-OF-WAY

The Division's policy permits such installations within the State highway rights-of-way under the following conditions:

1. The installation shall in no way obstruct or create safety hazards to vehicles and pedestrians;
2. The installation is aesthetically appropriate;
3. No commercial advertisements are permitted. A small sign readable to the users indicating or crediting the organization making the installation is permitted provided it is properly placed and obviously not intended for motorists to see as well;
4. The applicant shall make a request in writing and submit plans showing type of installation, dimensions, type of material, color scheme, structural design, and the location of the proposed installation relative to the highway;
5. All installations are subject to the Division's review and approval.
6. The applicant shall obtain a permit for the installation. No permit fee will be charged for installation of portable benches. The permit shall contain this statement: "The applicant understands that he shall continually maintain the installation to as nearly as possible its original as-built condition. The applicant further understands that the State may require the removal of the installation at any time. The cost of such removal shall be at the applicant's expense."

7. The applicant shall obtain a permit for any subsequent maintenance of the installation. No permit fee will be required for maintenance.
8. The State will assume liability of the bus shelter upon its satisfactory installation.

Photo courtesy of Plastetics, Inc.

Photo courtesy of Plastetics, Inc.

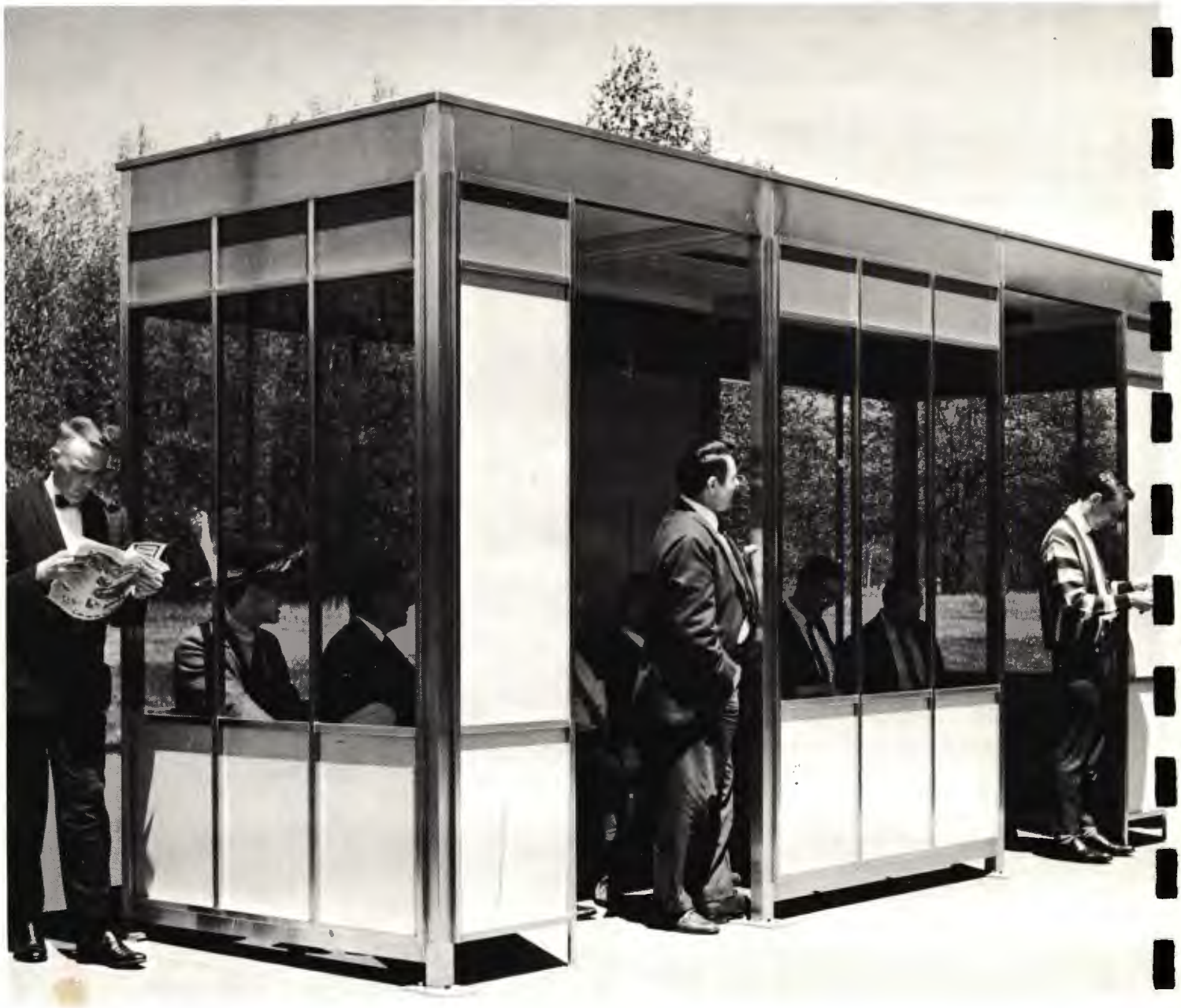

Photo Courtesy of U.S. Steel Co.

Photo Courtesy of Melrose Display Inc.

Photo Courtesy of Massachusetts Bay Transportation Authority

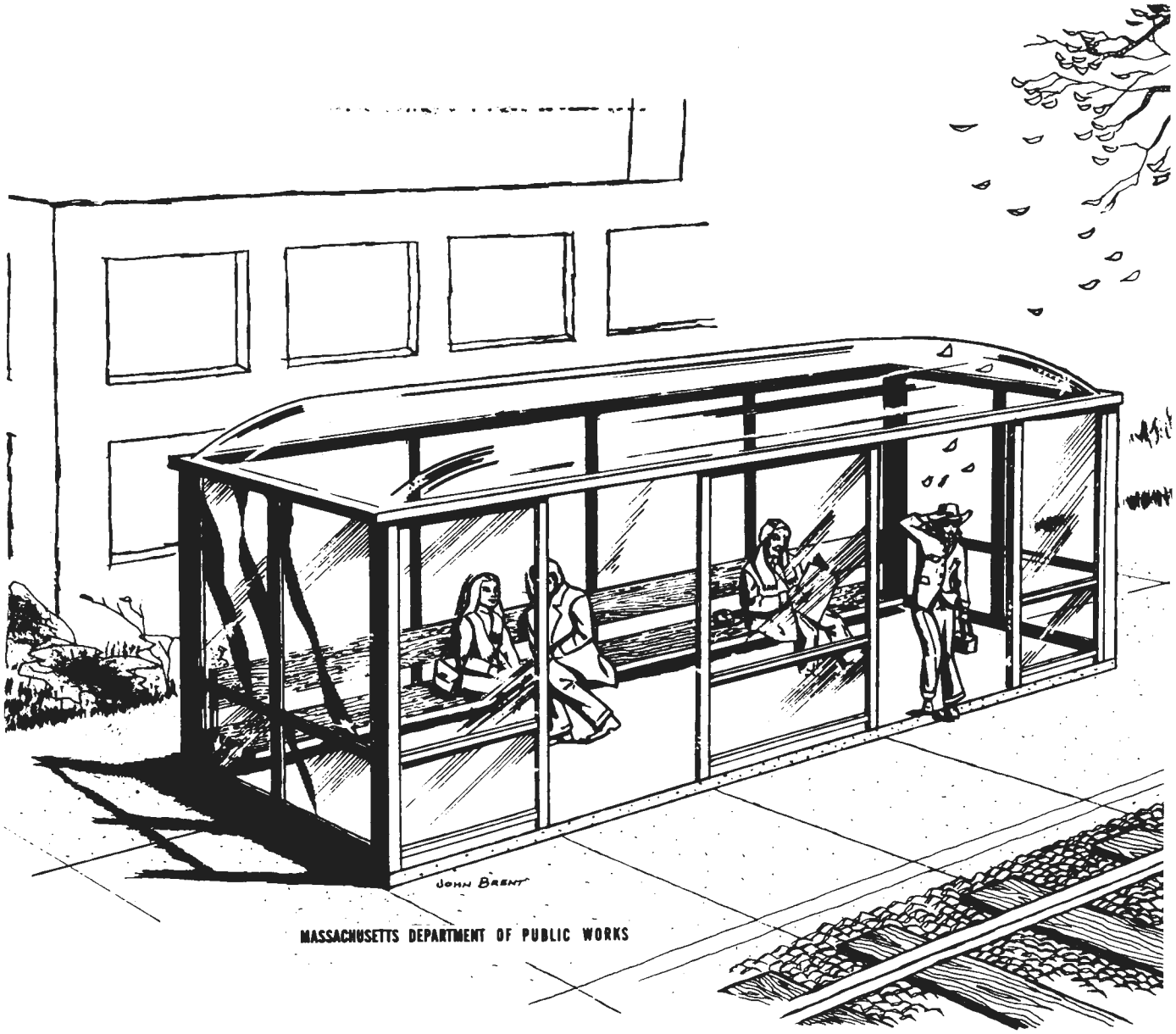

Photo Courtesy of Massachusetts Department of Public Works

Photo Courtesy of Massachusetts Department of
Public Works

Canopy

Photos Courtesy of the Michigan Department of Highways

Aluminum

Stainless Steel

Photos Courtesy of the Michigan Department of Highways

Photos Courtesy of City and County of Honolulu, Hawaii

Photo Courtesy of Cleveland Transit System

Photo Courtesy of Dayton, Ohio Transit Company

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

SUBJECT	FHWA NOTICE
Bus Shelters	

December 22, 1971

HP-24

Section 111 of the 1970 Highway Act permits the use of Federal highway funds to improve public mass transportation systems operating motor vehicles on highways. A paper transmitted with an FHWA Notice dated June 11, 1971, titled, "The New Highway Act and Bus Transit," discusses the various ways in which the act will be of assistance to highway-related urban transit.

Since the 1970 act specifically mentions "bus shelters" as one of the items eligible for Federal financing, consideration should be given to the implementation of this type of improvement. Bus shelters are simple and relatively inexpensive structures; yet, the comfort and convenience that they provide are added incentives toward more and better use of public mass transportation.

This office is in the process of gathering information on the types and characteristics of bus shelters more commonly used in urban areas. It is expected that this information will be assembled into a publication to be distributed to the field.

In cooperation with the American Transit Association (ATA), a survey will be conducted among a number of bus transit companies to obtain background information. Also, information has been procured from bus shelter manufacturers. We are also interested in obtaining information relative to the State highway departments experience on this matter. Information along the following lines will be useful:

(1) Past experience with projects involving shelters, including their design and construction.
(2) Problems foreseen in administering projects, such as in coordinating with municipalities and bus companies.
(3) State's attitudes towards implementing bus shelter projects.
(4) Availability of State funds.
(5) Photographs and literature available.
(6) Other comments and recommendations.

-more-

DISTRIBUTION: Headquarters
Regions
Divisions

The information gathered should be submitted to the Public Transportation Branch (HP-24).

G. E. Marple
Associate Administrator
for Planning

QESTIONNAIRE USED TO SURVEY AMERICAN TRANSIT ASSOCIATION MEMBERS

SURVEYS OF BUS SHELTERS

Please check the answer or answers as appropriate. Add any desired comments at the end of each question.

1. Size of shelter used by city or transit company.

(a) width(depth)		(b) length		(c) height	
less than 5'	_____	less than 6'	_____	6' to 6'6"	_____
5' to 7'	_____	6' to 8'	_____	6'6" to 7'0"	_____
7' to 9'	_____	8' to 10'	_____	7'0" to 7'6"	_____
9' to 11'	_____	10'to 12'	_____	over 7'6"	_____
over 11'	_____	over 12'	_____		

2. Predominant Construction Materials used.

(a) structural frame		(b)roof		(c)siding	
Aluminum	_____	plastic	_____	open side	_____
Steel	_____	glass	_____	glass	_____
Wood	_____	wood w/cover	_____	acrylic (plexiglass)	_____
Combination of materials	_____	Combination	_____	polycarbonate (lexan)	_____
Other(specify)	_____	Other(Specify)	___	Combination of materials	_____

3. Additional facilities provided.

(a) lighting _____ (c) benches _____
(b) heat _____ (d) travel information _____
(e) other (specify) _____

4. Entity responsible for care and maintenance.

(a) city _____ (c) citizens group _____
(b) transit company _____ (d) other private organizations _____
(e) other (specify) _____

5. Overall Experience with vandalism.
   (a) frequently vandalized _____
   (b) little vandalism _____
   (c) varies with location _____; more predominant at or near _____
   (specify; e.g., downtown, suburbs, near schools, ...etc.).

6. The shelters are:
   (a) designed and constructed by city or transit company _____
   (b) obtained from commercial sources _____
   if so, name manufacturer(s)

   _____

   _____

   _____

7. Are the shelters:
   (a) of a standard design (same for all locations) _____?
   (b) of a design that varies with location _____?

8. Average cost per shelter.
   (a) if installed by contract - total cost _____
   (b) if installed by agency: cost of furnishing shelter _____
   installation cost _____

9. Construction of the shelters was financed by:
   (a) the transit company _____ (c) civic association or group _____
   (b) the municipality _____ (d) private concern _____
   (e) other (specify) _____

10. Additional Comments:

   _____

   _____

   _____

Notes: (1) If there are pictures available of shelters erected during recent years, please furnish copies.
(2) If there are standard specifications for the construction of shelters, please furnish a copy.