PLANNING MANUAL FOR

COASTAL TRANSIT SERVICES

by

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January 25, 1983

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This book is being sent to you compliments of the California Sea Grant College Program. We hope you find it useful and welcome any comments or suggestions.

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INTRODUCTION

This manual is intended as a planning resource for coastal zone planners, transportation planners, transit operators, local officials, managers of recreation resources, and others interested in the provision of transit services in and around coastal recreation sites. It is based on information gathered in a national survey of existing coastal transit services, and contains planning guidelines reflecting the characteristics of successful systems. Topics addressed by the guidelines include (1) the roles of transit services in the provision of access to coastal recreation sites; (2) the relationship between recreation site characteristics and the type of service provided; (3) design characteristics of coastal transit services, such as vehicles, routes, schedules, and fares; (4) institutional arrangements; and (5) evaluation procedures.

The manual was produced as a part of a research project sponsored by the California Sea Grant Program and the California Department of Transportation. Besides producing the planning guidelines, the major purpose of the project was to provide an overview of current activity in the provision of coastal transit services. In order to gather information about such services, the study team conducted a national survey of existing and recently discontinued coastal transit sevices during the spring and summer of 1981.

This survey was conducted in two phases. The first phase was intended to establish the geographical distribution of coastal transit services; the second phase was intended to determine their design features and operating results, and to provide a preliminary idea of the factors contributing to their success or failure.

In the initial phase of the survey, letters were sent to approximately 125 planning agencies and transit operators representing 64 coastal areas (including the Great Lakes). Although most of these were urbanized areas, queries were also sent to several rural public transportation operators in coastal areas. In addition, members of the American Association of State Highway and Transportation Officials Standing Committee on Public Transportation and/or other state officials from 28 coastal and Great Lakes states were contacted.

Responses were received from 34 of the 64 areas contacted; in addition, state contacts reported coastal transit services in four areas that had not been directly contacted. Of the 38 coastal areas for which responses were received, 33 reported that there either were then or had previously been transit services at coastal recreation sites in the area. Subsequently, a few additional contacts were established, bringing the total number of areas involved in the second phase of the survey to 35. Figure 1 is a map showing the location of services involved in the second phase of the survey.

In the second phase of the survey, follow-up letters, telephone calls, and personal visits to transit operators, planning agencies, and local officials

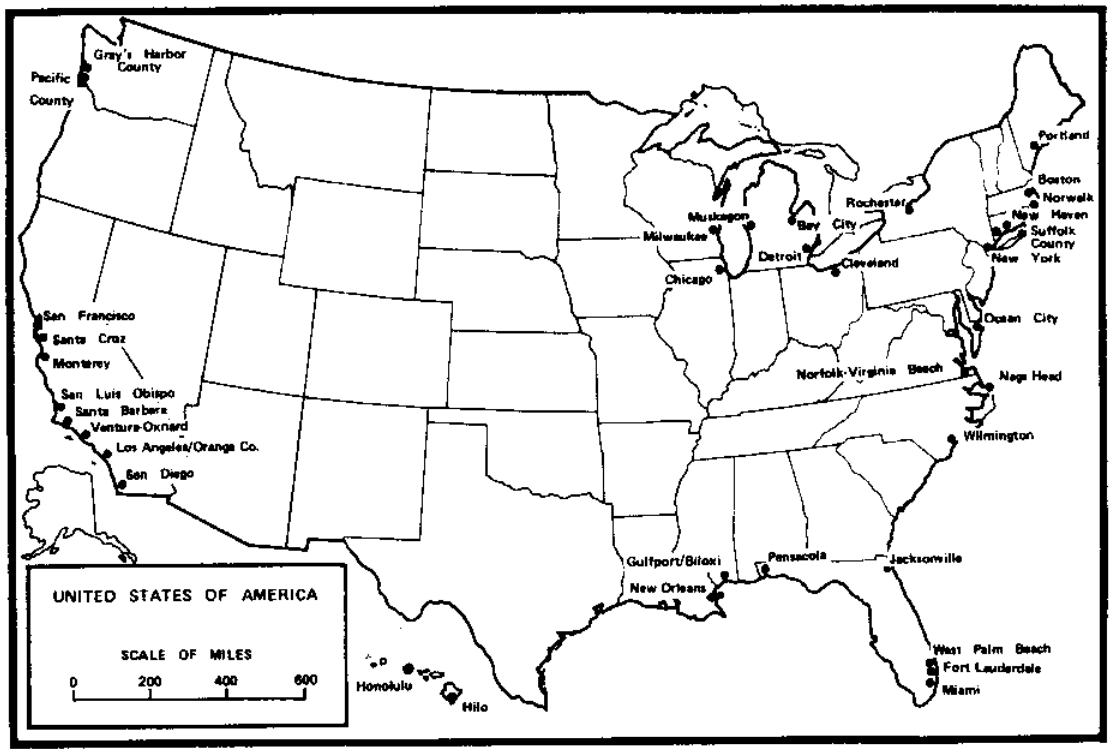

FIGURE 1: Locations of Services Reported in Coastal Tranist Survey

were used to gather additional information about the services reported in the first phase. Information sought included characteristics of recreation sites, institutional arrangements, design characteristics of services (routes, fares, schedules, etc.), and operating results (ridership, costs, and revenue). Detailed descriptions of the results of the survey may be found in references 1-4.

Information received in the coastal transit survey was the primary basis for the planning guidelines. This information provided the study team with a general picture of the relationships among site characteristics, transit system characteristics, and operating results for a variety of types of regular and experimental services, as well as providing specific examples of successful and unsuccessful projects. In addition, the survey provided fairly detailed information concerning the design characteristics of existing coastal transit services and somewhat less detailed information concerning site characteristics and operating results. Finally, the survey provided considerable qualitative information concerning the special issues and problems associated with coastal transit services, especially as these are perceived by the operators.

Tentative guidelines were drawn up, based on an analysis of this information, supplemented by in places by the study team's personal knowledge of practices common in the transit industry and by suggestions from literature related to transit system design and operation [5-8]. These tentative guidelines were incorporated in the project's interim report [1], which was released for review and comment to the respondents in the coastal transit survey and other interested individuals.

Although a number of comments concerning the interim report were received, these tended to focus on aspects other than the tentative guidelines. Meanwhile, the study team tested the guidelines for comprehensiveness and applicability by performing four trial transit planning studies for coastal sites in the San Diego area. Based on the results of these case studies, the final guidelines presented in this manual and summarized in reference 4 were drawn up.

COASTAL TRANSIT CONDITIONS

Although each proposed coastal transit service will be unique, certain conditions seen typical of the coastal transit environment. It is important that planners be aware of these conditions and take them into account in both feasibility analyses and detailed planning of coastal transit systems.

Level of Demand

Overall transit demand at coastal recreation sites varies a great deal. Although no quantitative relationships can be stated at our present level of knowledge, the key factors probably include the degree of usage of the site; the number of transit dependent individuals in the service area; the existence of competing sites and means of access; the fare; and the adequacy of the service offered, in terms of frequency, comfort, speed, and the like.

The level of ridership which can be attracted by a particular service is obviously a key issue in its planning, especially in determining its economic and financial feasibility. This issue is difficult to deal with in general terms, however, because it involves not only predicting ridership but also determining what level of patronage is acceptable under given circumstances. We may state as a general rule that, all other things being equal, the cost-effectiveness of transit services should improve as ridership increases. In individual cases, the relationship between total ridership and cost-effectiveness will be affected by unit costs and temporal variations in demand. Also, the minimum level of economic performance which will be considered acceptable may vary a great deal from community to community, depending on community values and on competing demands on resources.

Taking all these uncertainties into account, however, it still appears that there are many coastal recreation areas in the United States that can generate adequate levels of transit demand during the peak season, even though the volumes of traffic involved may be a small percentage of the total travel to the site. Also, in urban settings, the volume of recreation trips needed to support cost-effective service is even smaller, since it is the overall level of demand that determines the viability of the service, and coastal transit services (even specially-designed seasonal services) will usually attract a variety of types of trips.

Variability of Demand

The variability of demand over time is a major issue in the planning of coastal transit services. Unfortunately, a lack of detailed quantitative information makes it difficult to verify reported demand patterns; however,

reported peaking patterns include seasonal peaks, peaking on weekends, peaking within the day, and large irregular variations in daily and hourly demand.

Coastal recreation sites (and coastal transit services) throughout the United States experience sharp peaks in demand during the summer. With the exception of a few northern locations at which adverse weather conditions shorten the season, the peak season tends to coincide with local school vacations.

Other reported peaking patterns are hard to verify. Based on the limited data available, it does not appear that weekend peaking in transit demand in coastal areas is common, even where peaks in beach use do appear to occur on weekends. This is probably due to the mixture of trip purposes commonly served by "coastal" routes -- even though the demand for recreation trips may increase on weekends, demand for other types of trips decreases, and the net effect is that ridership is the same as, or lower than, on weekdays.

It does appear, however, that there are large and irregular variations in demand on a daily or hourly basis; however, these may not be more important on coastal routes than elsewhere. Reported exceptions occur at beaches in large metropolitan areas in the eastern United States, where sudden rainstorms are common; late afternoon storms are reported to cause extreme demand peaks, as transit patrons rush to leave the beaches.

"Normal" daily peaking patterns at day-use sites are reported to involve highly-directional flows inbound to the shore in the late morning and outbound from the shore in the mid- to late-afternoon. In resort areas, where transit systems are primarily providing circulation among hotel/motel establishments, commercial establishments, and recreation areas, transit demand is reported to peak at times when the majority of the vistors are not on the beaches, such as at night or during periods of bad weather.

Operating Conditions

In addition to the demand conditions discussed above, there are other conditions common in coastal areas which affect the operation of transit services. The most important of these are traffic congestion and the presence of potential passengers who wish to carry bulky items of recreational equipment, such as bicycles and surfboards. Traffic congestion is very common in coastal areas during periods of peak demand. Its presence tends to retard transit vehicles and destabilize schedules, although other factors, such as the normal variation in boarding and alighting times, also have an important impact on schedule adherence. Bulky equipment, if allowed on board, leads to large and highly variable passenger loading times (since equipment such as bicycles and surfboards must be secured in special racks) and these may further destabilize schedules. The combination of highly variable demand, traffic congestion, and highly variable loading and unloading times leads to poor schedule adherence on coastal transit routes, and to large variations in passenger loads from vehicle to vehicle, which often lead to overloaded vehicles or to passengers being passed up at stops.

ROLES OF TRANSIT SERVICE IN PROVIDING ACCESS TO COASTAL SITES

Normally, proposals for new or improved coastal transit service will arise for one of two reasons: either a transit operator perceives an attractive market, or someone perceives an access problem at a coastal site. In either case, one of two circumstances is apt to exist: either (1) there is unfulfilled demand for access to the site on the part of transit-dependent individuals or groups (that is, those whose access to automobiles is limited) or (2) there is some problem involving automobile access to the site -- either congestion or adverse environmental impacts. Consequently, the roles most often proposed for coastal transit services are to provide access for transit dependents or to substitute for automobile access.

This is not to say that coastal transit services should serve these purposes exclusively. Most regular transit routes in coastal areas (and some specially-designed seasonal services) will actually serve a variety of trip purposes. In most cases, this is desirable, since it tends to stabilize demand for the service by smoothing out the sharp weekly, daily, and seasonal peaks characteristic of coastal recreation demand. Consequently, coastal transit service should be designed to serve a variety of trip types where possible.

Access for Transit Dependents.

In most coastal areas, there will be a significant fraction of the population that has limited access to automobile transportation. This group forms a large part of the market for transit, especially for non-work trips, and may be expected to provide the bulk of the market for coastal transit services. Based on experience with existing coastal transit services, it appears that services geared primarily to transit dependents can attract adequate ridership at most coastal sites, although this is not universally true.

In planning service for transit dependents, it is best to adopt a regional perspective. In areas with an abundance of coastal recreation sites, not every coastal site needs to be "accessible" to transit dependents. Rather, the sites which will be most attractive to transit dependents should be identified and service should be concentrated at them. In general, the overall time amd money costs of access do seem to affect the choice of recreation sites by transit dependents, so that, where there is a choice, service to sites close to urban development is more likely to be well used than service to more remote sites. This is clearly the case in the New York area, for instance, where transit use is concentrated at such highly accessible sites as Coney Island and Rockaway Beach, despite the existence of specially-designed services at sites such as Jones Beach and Jacob Riis Park [9]. Similar situations exist in the San Francisco Bay area [10] and the Chicago area, where transit services to fairly remote National and State Park units are lightly patronized compared with regular transit services providing access to urban beaches.

In general, transit-dependent-oriented services should be provided to remote beaches only if there are no closer comparable sites (for instance, the services offered by the Rhode Island Public Transit Authority between the Providence metropolitan area and Narragansett) or the metropolitan area is large enough to support the service despite relatively low attractiveness, as in the cases cited above.

Substitute for Automobile Access.

Transit services are not likely to be successful substitutes for automobile access at coastal recreation sites except under special circumstances. These special circumstances include (1) highly-controlled environments in which parking is not permitted in the immediate vicinity of the shore and (2) densely-developed resort areas in which transit services can provide circulation among recreation sites and commercial establishments.

Elsewhere, especially at congested urban or suburban day-use sites, there is little evidence that transit services are an effective substitute for automobile access. In order to attract ridership, they should present significant advantages in terms of time, money, or convenience to individual passengers. This is difficult to achieve for a number of reasons: (1) parking charges at coastal sites are rarely very high relative to transit fares; (2) transit service always involves some time loss to the passenger in waiting for service; (3) transit vehicles normally must use the same congested facilities as private autos; and (4) at coastal sites, potential passengers are often carrying bulky items of equipment which make it difficult to use transit. Planning for coastal transit as a substitiute for automobile access should carefully consider whether the service can be made attractive to potential users, and may include consideration of an overall access strategy, such as coordination of parking charges or other auto restrictions with the provision of transit service. It should be noted, however, that measures restricting auto access are likely to encounter political opposition.

SITE TYPE AND TYPE OF SERVICE

Coastal recreation sites may be categorized as having primarily day use or overnight visitation and as being located in either urban or suburban areas or remote from them. Transit services in coastal recreation areas may be classified as follows:

1. Regular fixed-route services. These are year-round fixed-route services which are part of multi-purpose transit systems. Bus, rail rapid transit, and commuter rail services are included, although most such services use buses.

2. Special fixed-route services. These are usually seasonal services, and in some cases are operated by agencies other than regular transit organizations. They include access-oriented services, which provide seasonal express service between urban areas and remote recreation sites 5 to 25 miles away, and circulation-oriented services, which provide service parallel to the shore in densely-developed resort areas.

3. Shuttles. These services connect remote parking lots or trunkline transit services with recreation sites.

4. Group services. These services, which include private tour services, cater primarily to organized groups and tend to provide tour services (for instance, guides) as well as transportation.

5. Special event services. These are temporary services designed to provide transportation to special events (fairs, festivals, sporting events, and so forth) held at coastal recreation sites.

6. Other. Other services sometimes found in coastal recreation areas include ferries, special intercity services, and dial-a-ride services.

Due to a lack of specific information about the other types of services, the planning guidelines address only regular fixed-route services, special fixed-route services, and shuttles.

Urban or Suburban Day-Use Sites.

In most cases, the appropriate type of service for urban or suburban day use sites is regular fixed-route service. Such services comprise the bulk of the existing coastal transit system, in terms of both ridership and and the number of services reported in the coastal transit survey. Most frequently, such services will already exist at any site which would warrant them; consequently, planning related to them is likely to involve proposals for expansion or modification of existing service rather than establishment of new services. Where fixed route service already exists, its effectiveness should be evaluated as part of any plan for modification or expansion. Points to consider in such an evaluation include frequency of service, ease of access from known concentrations of transit dependents, unit costs (if available) and the possibility of operating problems, such as overcrowding and difficulty in adhering to schedules.

In the case of some highly-congested sites, park-and-ride shuttles may be appropriate. In general, however, experience with such systems has not been encouraging, for reasons already cited in the discussion of the role of transit as a substitute for automobile access (see page 6). If properly publicized and properly integrated into an overall scheme for traffic control, remote parking does hold some promise for relieving congestion in the immediate vicinity of the shore; however, alternatives to the use of specially-designed shuttle services should be considered for connecting remote lots with recreation sites. Possibilities include use of regular transit routes to serve remote lots or, in areas characterized by a combination of large-scale recreational and commercial development, a combination of parking shuttle and circulation services.

Remote Day-Use Sites

For day-use sites 5 to 25 miles from the urban area, consideration should be given to instituting seasonal express services designed to provide access for transit dependents. In determining whether the site is appropriate for this type of service, consideration should be given to the number of transit dependents in the area, the likelihood that they will engage in coastal recreation activities, and the attractiveness of this site vis-a-vis others in or near the urban area. As mentioned previously (see the discussion of the role of transit in providing access for transit dependents, page 5), ease of access does seem to be important to transit dependents, so that access-oriented services at remote sites are unlikely to be well used if there are more accessible sites in the urban area. In a few cases, parking at remote sites may not exist in the immediate vicinity of the shore. In these cases, park-and-ride shuttles are appropriate. Also, transit shuttles are sometimes appropriate for linking remote sites with trunkline transit systems.

Resort Areas

Areas with high rates of overnight visitation (resort areas) should be considered for circulation-oriented fixed-route systems. Any area with a peak visitor population of 100,000 or more can probably support such a system, provided development is concentrated in a strip along the shore, distances among commercial establishments are great enough to discourage walking, and some level of parking or traffic congestion exists.

DESIGN CHARACTERISTICS

Vehicle Selection

Regular transit systems operating in coastal areas will normally use the same types of vehicles on coastal routes as elsewhere. The major exception would be cases in which street geometrics (primarily widths and turning radii) do not permit use of full-sized vehicles. Seasonal services may use a variety of vehicle sizes, which will depend on the anticipated maximum passenger loads and on street geometrics. Given the difficulty in predicting maximum loads and the fact that vehicle costs are normally a small percentage of total costs, it is probably best to use the largest vehicles that are compatible with street conditions. In some cases, fears have been expressed that the smaller bus models have high maintenance costs. At present, there is little evidence from coastal systems to confirm or refute this, but potential maintenance costs are an important consideration in decisions about vehicle type.

Some seasonal systems, particularly circulation-oriented services in resort areas, use buses with nonstandard body designs. The most popular of these is the so-called "trolley" body, which resembles an old-fashioned streetcar or cable car body. These nonstandard bodies are used in the belief that they are attractive to potential riders and that they enhance the overall "image" of the resort community. There is no real evidence that nonstandard body styles actually increase ridership -- other design features, such as frequency of service, are probably more important -- but they may be attractive to potential advertisers, and hence increase advertising revenue. One drawback involved in the use of nonstandard bodies is increased maintenance costs.

Seasonal services may either lease vehicles, own them outright, or obtain them from a private firm which is also under contract to operate the service. Systems leasing vehicles report that monthly costs are high compared with amortization costs for similar vehicles owned outright, but since the costs occur only during the summer season, annual costs may be lower. Since most seasonal services operate only during school vacations, the alternative of using school bus equipment (or contracting with a private firm providing school transportation where such arrangements are in effect) should be considered.

Route and Stop Location

Regular transit routes in coastal areas which are designed to provide transit dependents with access to coastal recreation sites should connect the site as directly as possible with known concentrations of transit dependents and/or central transfer points in the local transit system.

Circulation-oriented systems will normally run parallel to the shore in areas of intense recreational or commercial development. For these systems, it is important that routing be as simple and direct as possible, and that major concentrations of commercial, recreational, and hotel/motel development be interconnected. If the boundaries of the developed area are not well-defined (say, by physical barriers) route length may be an important issue.

Transit shuttles should connect the site as directly as possible with the nearest transfer point on the trunk transit route they serve.

In the case of parking shuttles, the major issue is the location of the remote parking lots. These should be outside the congested area in the immediate vicinity of the shore, but otherwise located as close as possible to the recreation site. Also, park-and-ride lots should be located as close as possible to major access routes into the coastal area, and should be in as visible a location as possible, so that visitors can find them. It is also important, however, that if possible there be a relatively uncongested route from the lot to the site, so that the shuttle can maintain reasonable travel times.

For all types of coastal transit routes, as with other transit routes, consideration needs to be given to the geometric and structural adequacy of the streets involved, traffic conditions, and proximity of the route to the actual origins and destinations of riders. There will often be a conflict in coastal areas between avoiding traffic congestion and locating the route as close as possible to the destinations of the riders, since streets in the immediate vicinity of the shore are apt to be congested.

Location of routes and stops in the immediate coastal area should provide for adequate distribution of passengers to various destinations along the shore. In most cases, beach areas are rather extensive, so that several stops and some routing parallel to the shore will be appropriate. Stop locations along the shore should be reasonably frequent (a spacing of one to two blocks is common) and should include high-use sites such as parks, piers, amusement parks, or especially popular stretches of beach.

In order to increase route identification among riders, routes should be located to provide service in both directions on the same street where possible. The exception would be cases in which the streets nearest the shore are one-way. Stop locations should be clearly and conspicuously identified. This is particularly important in resort areas, where many riders may be unfamiliar with the system.

Schedules

Schedules should be designed to provide adequate frequency of service at all times. Although "adequacy" is not precisely defined in this case, it includes prevention of overcrowding of vehicles or passing up of passengers in all cases except during the most extreme irregular demand fluctuations, and consideration of passenger waiting times and inconvenience in periods of low demand. Existing coastal routes operate with headways of up to 60 minutes for urban/suburban sites and at frequencies of service as low as one trip per day at remote sites. The most common urban/suburban headway is 30 minutes, and this is recommended as the maximum desirable headway for urban/suburban routes.

(See Table 1). Schedules should be revised periodically based on operating experience and availability of resources.

In designing some of the more specialized coastal services, such as circulation-oriented services and shuttles, it is very important to consider the relationship between frequency of service, route length, and cost. The basic relationship is that

$$C = aN$$

where C = cost per unit time to operate the route
a = cost per vehicle per unit time
N = number of vehicles assigned to the route.

The number of vehicles needed to provide a particular frequency of service, in turn, is given by

$$N = \lceil Tq \rceil \quad \text{or} \quad N = \lceil T/h \rceil$$

where T = the cycle time of the route (travel time plus layovers)
q = frequency of service, in vehicles per unit time
h = headway (time separation between vehicles),

TABLE 1. Headways for Regular Transit Systems Operating in Coastal Areas

BASE HEADWAY, MIN.	NUMBER OF ROUTES
0 - 5	3
6 - 10	19
11 - 15	19
16 - 20	27
21 - 30	54
31 - 40	4
41 - 50	3
51 - 60	36
More Than 60	9

and the \\ symbol indicates that the quantity in question must be rounded to the next highest integer. Given that systems such as shuttles or circulation-oriented services need to operate at high frequency of service with as few vehicles as possible, the length and directness of the route and the ratio of travel time to layover time (all of which go together to determine T) may be crucial.

For new seasonal services, issues involved in producing the initial schedule include the length of the season and days and hours of operation, as well as frequency of service. In the absence of other considerations (for instance, known adverse weather conditions at some northern locations) the season should coincide with local school vacations. Where possible, services should operate seven days a week rather than weekends only, unless there is clear evidence of strong and consistent weekend peaking in recreation demand at the site in question. Even where recreational use does peak strongly on weekends, seven-day service may be justified on the basis of demand for nonrecreation trips, which should be accommodated along with the recreation trips where possible. Access-oriented services should normally operate at least from mid-morning (say, 9 a.m.) to sundown. Hours for circulation-oriented services should be extended to cover evening demand, which may last until midnight or later in some resort areas.

Fares

Generally speaking, coastal transit services should be able to command fares comparable to those of similar transit services in the same geographic area. Table 2 summarizes fares charged by coastal services in 1981 (or, for discontinued services, the last year of operation). Since fares have been changing rapidly with inflation, it would not be useful to recommend actual amounts. However, most regular transit sytems are able to recover from 20 to 50 percent of their costs from the farebox, and coastal services, if otherwise cost-effective, should normally be able to operate in the same range. Unless it is done for social reasons, there seems to be little justification for offering discount fares on coastal systems. For systems in direct competition with the auto (for instance, park-and-ride shuttles) a coordinated set of fares and parking charges is preferable to offering free or underpriced transit service. It should also be noted that such services have rarely attracted adequate ridership, even when they have offered discount fares.

INSTITUTIONAL ARRANGEMENTS

System Operation

Existing coastal transit services are operated under a variety of arrangements, no one of which appears to be clearly superior to the others. The most common arrangement is operation by a regular transit agency at its own initiative. Other possibilities include direct operation by a local government or by a park or recreation agency, or operation by a regular transit agency or a private firm under contract with a local government, or a park or recreation agency.

Considerations involved in determining operating arrangements in particular cases include cost, financial considerations, management experience, simplicity, and flexibility. In general, regular transit operators will be at a

Table 2. Coastal Transit Fares, 1981.

FARE, $	NUMBER OF SYSTEMS			
	REGULAR	ACCESS ORIENTED	CIRCULATION ORIENTED	SHUTTLE
Free	0	0	0	5
.10	0	1	0	0
.25	0	1	1	3
.35	0	0	1	0
.40	0	1	0	0
.50	10	2	4	1
.55	1	0	0	0
.60	4	1	0	0
.75	2	1	0	1
.80	2	0	0	0
.85	1	0	0	0
1.00	0	0	0	1
1.00 +	0	3	0	0

disadvantage in terms of cost due to union wage rates and work rules. On the other hand, they generally have considerable management experience, and may possess more operational flexibility than other operators. Also, they often have better access to general transportation subsidies than do other agencies, and this may be an important financial consideration.

Financial Arrangements

In most cases, financial arrangements will involve subsidies, either from the agency sponsoring the service or from external sources. A major source of subsidies has been regular transportation funds. Federal, local, or state funds, where available, may be sought through appropriate channels. Also, in some cases, new projects may qualify as demonstration projects under various transit funding programs. Of course, if regular transportation funds are sought for coastal projects, they will be in competition with other transit projects. Consequently, good potential cost-effectiveness (in terms of low cost per passenger or per passenger-mile) is important for projects seeking this type of funding. Services in resort areas have sometimes been able to secure substantial aid from the local business community, either from advertising

revenue or from outright contributions. Where services are intended to enhance the attractiveness of coastal commercial development, this funding source should be investigated.

MARKETING

Coastal transit systems employ a variety of marketing schemes. Regular transit systems operating routes in coastal areas may provide special brochures and/or route schedules describing coastal services. In addition, advertising geared to users of coastal recreation sites may be incorporated in routine advertising programs.

Marketing efforts for special services, especially new ones, are often quite elaborate. They may involve market research; brochures; news releases; radio, television, newspaper, and/or magazine advertising; and special promotional campaigns involving local merchants.

Market research efforts are a potentially useful way of determining whether demand exists for new services. Their results, however, should be viewed with caution. In the first place, it is very important that potential services be described accurately to the respondents in marketing surveys, and this may be difficult if the surveys are conducted before planning is complete. Also, there appears to be a tendency for respondents in surveys conducted prior to the beginning of service to substantially overstate their willingness to use transit services.

Adequate advertising is of crucial importance in attracting ridership to new coastal transit services. Unfortunately, it is also quite expensive, with marketing budgets for experimental services often accounting for 25 percent or more of the total project costs. At present, it is not possible to state which of the advertising media is most effective in attracting ridership; however, this probably depends on local conditions and on the target population.

EVALUATION

Coastal transit services, particularly those that are specially-designed, should be carefully evaluated to determine whether they are achieving their objectives and whether they are cost-effective when compared with alternative ways of achieving their objectives. In addition, design and operating characteristics should be carefully documented, so that future project sponsors will have a better data base from which to begin planning.

Coastal transit projects should have realistic objectives. These should be stated clearly, and in terms which allow convenient evaluation. At the least, there should be some idea of the intended scope and cost of the project, the target population in terms of ridership, and the expected benefits. Where possible, the objectives should be quantified.

Evaluations should clearly document the design and operating characteristics of the transit service. This documentation should describe routes, schedules, vehicles, and fares. The documentation should also record results in terms of ridership, costs, revenue, and any special operating problems or procedures. Ridership information will ideally include results from ridership surveys which will establish the actual trip purposes and

socioeconomic characteristics of passengers and daily ridership counts which will establish the presence or absence of weekly peaking patterns. Cost data should be broken down according to the type of expenditure, and actual expenditures should be compared with budgeted amounts. Documentation of special operating problems should include studies of on-time performance, reports of overcrowding, reports of assignment of extra service, and the like.

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GLOSSARY

Access-oriented service. A transit service primarily intended to provide access to a remote recreation site for transit dependents.

Circulation-oriented service. Transit service parallel to the shore in densely-developed resort areas.

Cost-effective system or route. Transit service that achieves an acceptable proportion of operating costs from passenger fares, or provides service at an acceptable cost per passenger carried or per passenger-mile.

Cycle time. Scheduled round-trip travel time on a transit route, including layovers.

Fixed-route service. Public transit operating with predetermined routes and schedules. Regular fixed-route service implies year-round service provided as part of a general-purpose transit system.

Group services. Services, including private tour services, which cater primarily to organized groups and tend to provide tour services as well as transportation.

Layover. Time a transit vehicle spends waiting at the end of its route. Layovers are used to provide work breaks for drivers, to dampen variations in run times, and to adjust cycle times to headways.

Park-and-ride shuttles. Shuttles connecting remote parking lots and recreation areas.

Shuttles. Transit services connecting remote parking lots or trunk line transit services with recreation sites.

Special event services. Temporary services designed to provide transportation to special events held at coastal recreation sites.

Street geometrics. Physical design features of streets, such a width, cross-section, grade, curvature, etc.

Special fixed-route services. Fixed-route services which are seasonal, are operated by agencies other than regular transit systems, or both.

Transit dependents. Individuals who do not have access to automobiles and are thus dependent on public transit.

Transit shuttles. Shuttles connecting trunkline transit services to recreational sites.

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