

NATIONAL COOPERATIVE
HIGHWAY RESEARCH PROGRAM REPORT

241

**GUIDELINES FOR USING
VANPOOLS AND CARPOOLS AS A
TSM TECHNIQUE**

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NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM
REPORT

241

GUIDELINES FOR USING VANPOOLS AND CARPOOLS AS A TSM TECHNIQUE

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WASHINGTON, D.C.

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NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Systematic, well-designed research provides the most effective approach to the solution of many problems facing highway administrators and engineers. Often, highway problems are of local interest and can best be studied by highway departments individually or in cooperation with their state universities and others. However, the accelerating growth of highway transportation develops increasingly complex problems of wide interest to highway authorities. These problems are best studied through a coordinated program of cooperative research.

In recognition of these needs, the highway administrators of the American Association of State Highway and Transportation Officials initiated in 1962 an objective national highway research program employing modern scientific techniques. This program is supported on a continuing basis by funds from participating member states of the Association and it receives the full cooperation and support of the Federal Highway Administration, United States Department of Transportation.

The Transportation Research Board of the National Research Council was requested by the Association to administer the research program because of the Board's recognized objectivity and understanding of modern research practices. The Board is uniquely suited for this purpose as: it maintains an extensive committee structure from which authorities on any highway transportation subject may be drawn; it possesses avenues of communications and cooperation with federal, state, and local governmental agencies, universities, and industry; its relationship to its parent organization, the National Academy of Sciences, a private, nonprofit institution, is an insurance of objectivity; it maintains a full-time research correlation staff of specialists in highway transportation matters to bring the findings of research directly to those who are in a position to use them.

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The needs for highway research are many, and the National Cooperative Highway Research Program can make significant contributions to the solution of highway transportation problems of mutual concern to many responsible groups. The program, however, is intended to complement rather than to substitute for or duplicate other highway research programs.

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The members of the technical committee selected to monitor this project and to review this report were chosen for recognized scholarly competence and with due consideration for the balance of disciplines appropriate to the project. The opinions and conclusions expressed or implied are those of the research agency that performed the research, and, while they have been accepted as appropriate by the technical committee, they are not necessarily those of the Transportation Research Board, the National Research Council, the National Academy of Sciences, or the program sponsors.

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FOREWORD

*By Staff
Transportation
Research Board*

This manual will be of principal interest to urban transportation policy makers and practitioners, especially ridesharing practitioners, concerned with transportation system management. Furthermore, it will be of interest to heads of ridesharing departments of employers in private and public sectors. The policy maker will find a ready reference of core information needed to assess the potential of ridesharing as an element in the Transportation Improvement Program. Urban transportation practitioners will find a host of how-to-do-it information to assist in: targeting the market, determining appropriate ridesharing incentives, selecting the appropriate ridesharing and organizational types, identifying federal policies and programs relevant to ridesharing, determining a role for transit operators in the ridesharing program, and evaluating the effectiveness of proposed and on-going ridesharing programs.

A fundamental strategy of transportation system management is to encourage more efficient use of highway and roadway vehicles and space through higher vehicle occupancies. Although highway and transportation departments, transit authorities, and other public agencies can and do encourage increased commuter use of carpools and vanpools in large and small urban areas in a variety of ways (computer matching, purchase of vans for vanpooling, parking incentive programs, preferential highway treatment, etc.), many people fail to take advantage of, or even resist, these opportunities when offered. Decisions to participate in commuter-ridesharing arrangements are based on many factors (economic, social, and psychological). Not well understood until now is how the two ridesharing alternatives of carpooling and vanpooling differ in their appeal to commuters in urban regions, and how the great variety of incentives for carpooling and vanpooling affect their use. An understanding of the underlying factors that motivate the decision to rideshare has been necessary in order to assess the full potential of ridesharing development and to determine effective strategies to achieve that potential.

In addition, many existing institutional factors shape the kinds of carpooling and vanpooling incentives it is possible to implement: regulatory, zoning, insurance, profit motive, funding limitations, sponsor types. The determination of effective strategies and the subsequent evaluation of their implementation require methods and criteria that consider social, economic, travel, energy, and environmental impacts, as well as the perceptual, preferential, and attitudinal concerns of the public and decision-makers generally. Such concerns and impacts until now have not been determined or assessed.

This manual utilizes research results from NCHRP Project 8-21 together with state-of-the-art information to guide ridesharing practitioners in the development of a ridesharing program. The manual provides answers to important questions such as, What are the key ridesharing target groups? Which travelers are most likely to rideshare, and how can they be identified and reached? What incentives

will appeal to somewhat less ready acceptors? When and where is it most effective to promote carpools, taxipools, private vanpools, company vanpools, third-party vanpools and/or buspools? What types of promotion are most effective? When, if and what mass-media techniques should be used? How can the critical upper management support be gained from employers? How can the commuters then be reached most effectively? What are the sources of support for the ridesharing agency (RSA)? What are the pros and cons of federal, state, local, and private support? How can one plan in the face of uncertain future funding? What evaluation techniques will help improve the performance of the RSA? How are they actually used?

The manual has been developed for application by all transportation planning professionals, and should be considered as a planning guide to which individuals add their own ideas, observations, and objectives to provide a more focused reference for the particular environment in which it is to be applied.

The research findings on which this manual is based are summarized in Appendix D. Detailed findings and survey data are reported in the agency's final report, "Using Vanpools and Carpools as a Transportation System Management Technique: Research Report." A limited supply of these reports is available for purchase in hard copy at \$11.50 each plus postage and handling or in microfiche at \$4.50 each.

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Dr. Marion Ruth Misch, Deputy Director of the Behavioral Studies Group, was the principal investigator, and Dr. Joseph B. Margolin, Director of the Behavioral Studies Group, was the co-principal investigator. The other participants from Crain and Associates were: David A. Curry, subcontract manager, Lawrence Jesse Glazer, Guillaume Shearin, and Peter Webb, joined by Nancy Klein and Don Torluemke as consultants.

The George Washington University principal investigators were responsible for assessing behavioral and social elements in the literature and ridesharing programs review; for planning, implementing, analyzing and reporting the new data gathered in this study (decision analysis panel series and surveys in four metropolitan areas); for incorporating the new and existing behavioral and social data into this manual. The Crain and Associates team took major responsibility for the literature and ridesharing programs review, for preparation of the initial draft of the manual, and for administering the survey portion of data collection in two of the four study sites. The two teams collaborated in identifying knowledge gaps preparatory to gathering the new data and in revising the manual.

MARION RUTH MISCH
In Memoriam

As this report was going to press, the NCHRP learned of the sudden and unexpected death of Dr. Marion Ruth Misch, the co-author and co-principal investigator. Her untimely death is a loss to all who knew her and a loss to research in travel behavior. Report 241 is a tribute to Dr. Misch and her dedication to the research on which these guidelines are based.

GUIDELINES FOR USING VANPOOLS AND CARPOOLS AS A TSM TECHNIQUE

SUMMARY

The emergence of ridesharing as a significant transportation mode has been rapid and accompanied by changes in both technique and technology. Ridesharing is one of the most immediate, economical, and flexible methods for dealing with problems arising from energy shortages, air pollution, congestion, and transportation emergencies. Its development requires relatively little lead time and no special appropriations or taxes. Furthermore, the design of each program can fit the unique needs of each community or population segment. Ridesharing at its simplest represents a quantum increase in the productivity of the automobile. Although commuting has been the primary focus of ridesharing programs, they may be applied to shopping, to recreational events, and potentially to such industries as tourism.

This manual is designed to assist both existing and new ridesharing agencies in their continuing development as successful, community-oriented service organizations. It integrates the results of literature search, contacts with local ridesharing agencies, and findings from decision analysis panels and surveys conducted in four metropolitan areas of the United States. (The final report of the decision analysis panels and surveys carried out in preparation for this manual and entitled, "Using Vanpools and Carpools as a Transportation System Management Technique: Research Report," is not published herein (for availability, see Foreword). The manual provides guidelines for the several stages that any local ridesharing agency will experience in setting up a community ridesharing program. The manual details these stages, which are briefly described as follows:

- Understanding the goals and nature of ridesharing and of ridesharers.
- Understanding the community conditions and characteristics that affect ridesharing programs.
- Adopting program design guidelines or policies suited to the community and its commuters.
- Planning the ridesharing program.
- Implementing the program.
- Operating the program while encouraging and/or responding to indirect incentives, such as high occupancy vehicle lanes.
- Evaluating and improving the program.

The first stage in any successful program is to understand its goals and its nature. What are the reasons for establishing a ridesharing program? How do those reasons relate to such national and local interests as conserving energy, making better use of highways, and reducing the need for parking space? How do they relate to commuter goals, such as comfort, speed, convenience, reliability, and flexibility of service? How do they relate to employer goals, such as economies in fringe benefit parking and land investments, preserving good union relationships, and maintaining or improving employee morale? What are the ridesharing techniques that could best achieve these benefits? Specifically, how can the sometimes divergent goals of planners, commuters, and employers be served?

A second preparatory stage is to learn how understanding the community characteristics can be used to shape successful ridesharing programs. The best sources for such information are (1) experience with past and present ridesharing programs, and (2) research on ridesharing behavior and incentives. This manual draws on both sources.

Once the conditions are known that permit attaining ridesharing goals in line with the local community's interest, it is time for the third stage: developing and adopting policy guidelines for the program on matters such as: prime, second, and third level target groups; possible brokerage approaches; necessary networking with existing transportation agencies; types of collaborating employer and/or neighborhood agencies to approach; approaches to promote client awareness, interest, and continuing participation; flexibility for ongoing, formative program evaluation. These policies will then influence the next three stages: planning, implementing, and operating the ridesharing program.

Planning the ridesharing program requires dealing with a large amount of existing data and many civic, political, and business leaders. Depending on the data available for the community, it may be advisable to gather new information concerning commuter, employer, and other transportation agency needs and motivations in the local area. From these sources, information will be gained on local transportation concerns and the prospective demand for ridesharing in the community that will provide the basis for initial choices on details of the program—choices that may be modified later as experience and/or changing conditions indicate. What will be the form of the ridesharing organization? What span of services will it offer? What types of ridesharing and of matching systems will be effective for the particular populations to be served? What techniques and program elements are likely to appeal to those most ready for ridesharing? What might induce more reluctant, or previously disillusioned, travelers to try it? What balance of incentives will be effective for different market segments among travelers? What modifications will encourage particular employers or neighborhood groups to cooperate? Once the initial choices are made, implementation will be a matter of carrying out the organization and staffing plan. This may require a fair amount of on-the-job training because ridesharing program experience is not yet widely distributed, and the process itself is a developing art.

Ridesharing operations are usually directed at two audiences: employers who can easily contact natural concentrations of commuters; and the travelers themselves, who may be contacted through their places of employment; through civic, church, or other groups near their homes; and through public information channels. They can also be reached with the help of facilitating agencies, such as the state department of transportation, that can create attractive advantages (i.e., indirect incentives for ridesharing like reserved freeway lanes and preferential parking for high occupancy vehicles). Other facilitating agencies include metropolitan planning organizations, urban traffic departments and transit operators, and the state public utility commission. Any ridesharing agency (RSA), whether it is part of the local or state government, or not, will need to maintain close working relationships with such agencies so that there will be an effective match between the RSA's goals and activities and those of the rest of the community.

Once a ridesharing program has been created, it is important to keep abreast of the outcomes, in terms of both program objectives and needs of participants. This evaluation is an ongoing process that affects both the operation of the program and its future plans. Ridesharing is a new enough activity, and communities vary enough, that no predetermined formula can be applied without modification to suit local conditions. The feedback from ongoing evaluation that is planned from the beginning and used to shape the program as it develops (most commonly known as formative and, sometimes, as cybernetic, evaluation) will be crucial for continuing program vitality.

Evaluation is also a form of action research. In addition to providing data crucial for program changes, it (1) demonstrates to the community the ridesharing agency's interest in potential users, and (2) provides current indicators of effectiveness for policy purposes, as well as feedback to administrators and legislators for planning and budgeting purposes.

Figure I shows how the stages and activities outlined are related. The seven chapters of the manual correspond with the numbered boxes. Two of the topics in the unnumbered boxes, the general characteristics of commuters and the expected benefits of increased ridesharing, are discussed in Chapter One because both topics are closely related to ridesharing goals. More detailed findings on specific target groups from the 4-cities study carried out as part of the preparation for this manual are covered in Appendix D of this manual. Promoting employer ride-

sharing programs (the third unnumbered box) is discussed in Section 4.6. The three major forms of ridesharing—carpooling, vanpooling, and buspooling—are covered integrally at each stage, but third party vanpools and buspools are also considered separately in Appendix E.

The aims in this manual are to at least touch one very important topic related to setting up and operating a community ridesharing program; to emphasize the incentives that need to be provided for gaining the attention and cooperation of commuters; and to refer to other publications for details when a topic is well covered elsewhere.

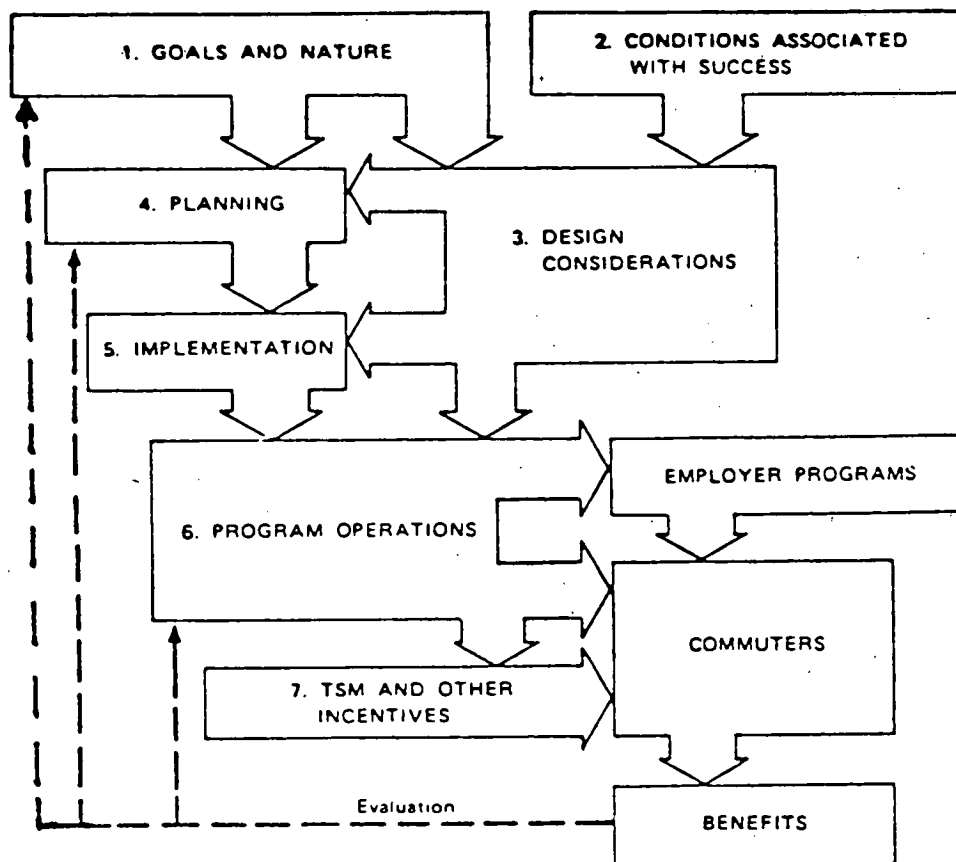


Figure 1. Stages of a local ridesharing program.

GOALS AND NATURE OF RIDESHARING

■ Why promote ridesharing among travelers in an area? What are the benefits to ridesharers, employers, and the tax-paying community? The costs? What are the needs of travelers in general, and the types of ridesharing services to fill those needs, and what program and promotion strategies do these suggest? What outreach techniques and program incentives are available? How compatible is ridesharing with other TSM strategies? And finally, what are the major sources of further information and help? This chapter addresses such questions. ■

1.1 KEY TERMS

Carpools refer to rides shared in private automobiles by two or more people, on a continuing basis, regardless of their relationship to each other or of cost-sharing agreements.

Vanpool indicates prearranged membership in a group whose members are picked up at specific points (possibly their home) to be taken to common or nearby employment sites, then returned to the pickup point(s) after the end of the workday. The van in which they ride may be driven: (1) by an appointed group member who normally has responsibility for vehicle upkeep and use of the van at times, and (2) by a vanpool agency driver.

Third party vanpool service refers to service provided by the RSA or other agencies that serve multiple employers.

Buspool, club bus, subscription bus, and custom bus are used interchangeably to refer to express bus service with limited pickup and destination stops, guaranteed seats, and advance ticket purchase.

Employer program or employer ridesharing program refers to any company, public agency, or institution (such as a school) that promotes ridesharing among its employees, members, or students.

Local agency or local ridesharing agency (RSA) refers to the areawide organization that markets and assists ridesharing by the general public and among employers. An RSA may be public or private.

VMT is vehicle-miles of travel, the prime measure of vehicular movement in an area, usually expressed as averaged daily or annual VMT.

TSM is the abbreviation for transportation systems management, a federal program to promote low-cost, noncapital-intensive, and quickly implementable means of improving highway traffic flow, reducing VMT, and increasing highway capacity. Ridesharing is an important element in TSM.

First acceptors indicate those ready individuals who respond very quickly to the first program efforts either because they have wanted for some time to rideshare or because a particular event, like a gasoline shortage, has suddenly pushed them to it. The important difference between first and later acceptors is that first acceptors arrive on their own, their motivation already determined. Later acceptors can be brought in only by sensitive attention to their preferences and needs and by much stronger outreach efforts.

Formative evaluation is an ongoing process of checking how the program is meeting its goals and those of potential ridesharers. Unlike "summative" evaluation—which asks the question, Was this program a success according to preset criteria?—formative evaluation asks such questions as: How much are we fostering ridesharing? Should some goals be changed? Should we try different methods or approaches? Which ones?

Transportation policy makers form a large and diverse group which overlaps partially with the next, TSM practitioners.

TSM practitioners include people who support the RSA directly (with funding, public relations, etc.), or indirectly (with preferential lanes, parking management plans, etc.).

1.2 RIDESHARING PROGRAM GOALS, BENEFITS, AND COSTS

1.2.1 Goals and Benefits

According to a Census Bureau study of 20 U.S. cities for 1977 (released in February 1981), an average of 66 percent of commuters drove alone to work. The range was from 58 percent to 82 percent (1). Clearly, a large proportion of the nation's commuters comprises solo drivers, whether from preference, necessity, or habit. Increases in commuter ridesharing could produce such benefits as:

- Lower commuting costs, reduced automobile dependence, and reduced traffic congestion and auto maintenance "hassles" for commuters themselves.
- Reduced parking demand and improved resistance to the disruptive effects of fuel shortages for employers.
- Community and societal savings such as reduced air pollution, less traffic congestion and new highway demand, and energy conservation.

The ultimate goal of most local ridesharing programs is to realize these types of benefits, at acceptable costs, by making available a variety of ridesharing services to commuters, principally carpooling, vanpooling, buspooling, and transit information.

It must be realized, however, that what motivates the pub-

lic sector planner may not motivate the employer or the consumer. These are three different worlds, with many more than three points of view. Such policy goals as reducing traffic congestion or minimizing air pollution have not, in the past, motivated great numbers of solo drivers to rideshare. Neither has the lower cost of ridesharing. As citizens, people may be interested in such issues. In the day-to-day business of getting to and from work, however, most have far different priorities. These daily priorities are shaped by personal, family, and workplace demands. Furthermore, many feel that nothing an individual can do will help meet such broad goals as conserving the fossil fuel supply effectively. Finally, the large majority of commuters have not yet had experience with truly debilitating gas shortages, severe parking restrictions, or fuel costs escalating beyond budgets (although this is now worrying many more).

Understanding commuter goals, therefore, requires understanding and working with what is often a split among societal, employer, and individual goals in transportation. Even within the commuter group, successful ridesharing programs must offer alternatives to solo driving that suit the goals (needs and priorities) of the people to be served. Because this population inevitably breaks down into different segments according to the personal, family, and workplace demands which shape their travel priorities, successful ridesharing programs will require approaches tailored to the goals of the (fairly large) population subgroups or market segments in any particular region. These approaches must also be tailored to how those target groups see things, their fears, satisfactions and how they feel required to do things.

Table 1 gives prospective ridesharing goals grouped into the categories of commuter benefits as these have emerged from research and program experience; employer benefits; and community, state, and national benefits. Commuters in a given community are likely to be highly interested in only certain of the benefits listed. The various target groups will value some of these more than others. Nor will the goals of a ridesharing program necessarily include all those in the list. For example, if an area has low traffic congestion, a ridesharing program probably would not reduce congestion enough to measure. On the other hand, if congestion, delay, and air and noise pollution are important issues in an area, the traffic and environmental benefits can be major goals. Moreover, if local growth in employment has caused this traffic congestion, some employers may be very supportive of a ridesharing program that emphasizes these goals.

As the potential benefits of ridesharing programs are discussed in more detail, the reader can consider the circumstances particular to each benefit and decide if it may apply or can be modified to suit particular program goals. The possible range of each benefit is mentioned in the following text where quantitative data are available to facilitate setting specific targets for certain goals if desired.

1.2.1.1 Commuter Benefits

The primary users of local ridesharing services will be commuters from participating companies or neighborhood organizations, as well as some commuters who respond to the public promotion. Additionally, some commuters may start to rideshare on their own because of the public promotion. This latter group may be as large as the primary users

Table 1. Prospective ridesharing program goals.

<u>Commuter Benefits</u>	
Reduced hassle and fatigue from driving, especially in congested traffic	
Reduced commuting cost (fuel, maintenance, insurance, parking, and vehicle ownership costs)	
Reduced vehicle maintenance difficulties and responsibilities,	
Reduced susceptibility to fuel shortages and associated difficulties such as gas lines and higher fuel costs	
Increased reliability of commute, particularly in vanpools and buspools	
Socializing opportunities with ridesharing acquaintances	
Opportunity for riders to spend commuting time reading, sleeping, relaxing	
Enjoyment of ridesharing incentives, e.g., preferential parking and freeway access	
Reduced dependence on a personal automobile, and possible elimination of commute vehicle or availability for alternative uses	
Reduced need to find parking or anxiety about parking	
Door-to-door service (compared with public transit)	
<u>Employer Benefits</u>	
Reduced parking demand, resulting in fewer parking spaces, more usable space, less capital expended for parking areas, and less need for local parking control	
Alleviation of local traffic congestion	
Reduce employee tardiness and fatigue, and improved morale	
Greater certainty about getting employees to work during a fuel shortage (emergency plans)	
Improved security in parking lots	
Reduced need for traffic control	
Lower taxes for road building, traffic management, public parking, etc.	
Access to expanded labor pools	
Public relations boost for reducing community traffic, energy use, air pollution, and noise pollution	
Improved employee morale	
Compliance with ridesharing laws	
Fringe benefits for employees (such as better parking for pools)	
<u>Community, State and National Benefits</u>	
Reduced peak period traffic congestion	
Reduced energy use	
Reduced air pollution	
Reduced accident costs	
Reduced parking demand	
Reduced need for additional highway capacity	

(2). The main benefits that accrue to these users compared with solo drivers are discussed in the following section. How appealing each benefit may be, as previously mentioned, will vary according to population segments. Motivation for ridesharing will vary most by regions or metropolitan area, next most by occupation groups, and to some degree by other characteristics such as sex (3).

Reduced Commuting Costs. This benefit is discussed first, not because saving commuting money is the primary motivation of the greatest number of solo drivers today, but because it is the prevailing "common wisdom" about what motivates people to rideshare. The cost advantage is so obvious that no

planner would want to miss it. Also, current poolers often mention the money they save when asked why they ride-share, although recent research indicates that the strongest concentration on cost savings comes to the fore after pooling starts, rather than as a cause, for most commuters (4). Comparative cost savings are detailed in the paragraphs that follow, both for the reader's orientation and as a basis for strategies to be used for those target groups to whom the cost savings are critical (certain blue collar workers and modest income groups, for example). As petroleum costs have continued to escalate, more and more, solo drivers are concerned about costs, as the 4-cities study (3) indicated. However, desire for mastery over the specifics of the commute and for flexible mobility, as well as social concerns about ridesharing, is so high that many still choose some other budget area in which to ease the economic "pinch" brought on by rising vehicle fuel costs.

Commuting costs vary with commute distance and vehicle occupancy. Figure 1 shows typical commuting costs for bus, rail, solo auto, carpool, owner-operated vanpool, third-party vanpool, and subscription bus modes for round trips of 30 and 60 miles. A range of vehicle occupancies is shown for each of the ridesharing modes. A gasoline price of \$1.40 per gallon was assumed, and other cost assumptions are given in Appendix A. Ownership costs that vary with mileage are included in the private auto costs. These are approximately 22 percent of the total ownership costs given in Table A-2. Distance and cost have been added for carpool, vanpool, and club bus modes to account for average route diversion to pickup points and for commuter travel to the pickup points.

The ridesharing modes are much cheaper in out-of-pocket costs than either of the solo auto modes, and are roughly comparable to the subsidized transit modes. Vehicle occupancy determines how much cheaper the ridesharing modes are than the solo auto. For example, cost savings from carpooling, instead of driving 30 miles alone to and from work in a compact auto, vary from \$1.31 to \$3.12 per day respectively. At 60 miles, these savings increase substantially to \$5.27 to \$8.66 for the driver of the full-size auto, or about \$1,300 to \$2,200 for a 250-day commuting year. Persons who avoid the fixed auto ownership costs by carpooling can realize added savings of \$6.09 per day for a full-size auto.

Vehicle occupancy also determines the relative costs of the ridesharing modes. At full occupancy, the carpool is cheaper than the van or club bus modes on a 30-mile round trip. At 60 miles, the carpool is more expensive than the owner-operated vanpool, but still cheaper than the others. With only two persons in it, however, the carpool is more expensive than the vans or club bus at any occupancy. It should be noted that in 1976 Margolin and Misch (4) found that solo drivers favored 2-person carpools if they were going to carpool. By 1980, the 4-cities study showed that this preference had changed to 83 percent of the solo drivers who opted for 3- or 4-person carpools.

The owner-operated van is generally cheaper than the third-party van because of lower insurance costs, no leasing company costs, and income tax deductions on sales tax and finance charges, and cheaper financing. Both types of vans are generally cheaper than the unsubsidized bus, principally because of the high cost of paid drivers and deadheading.

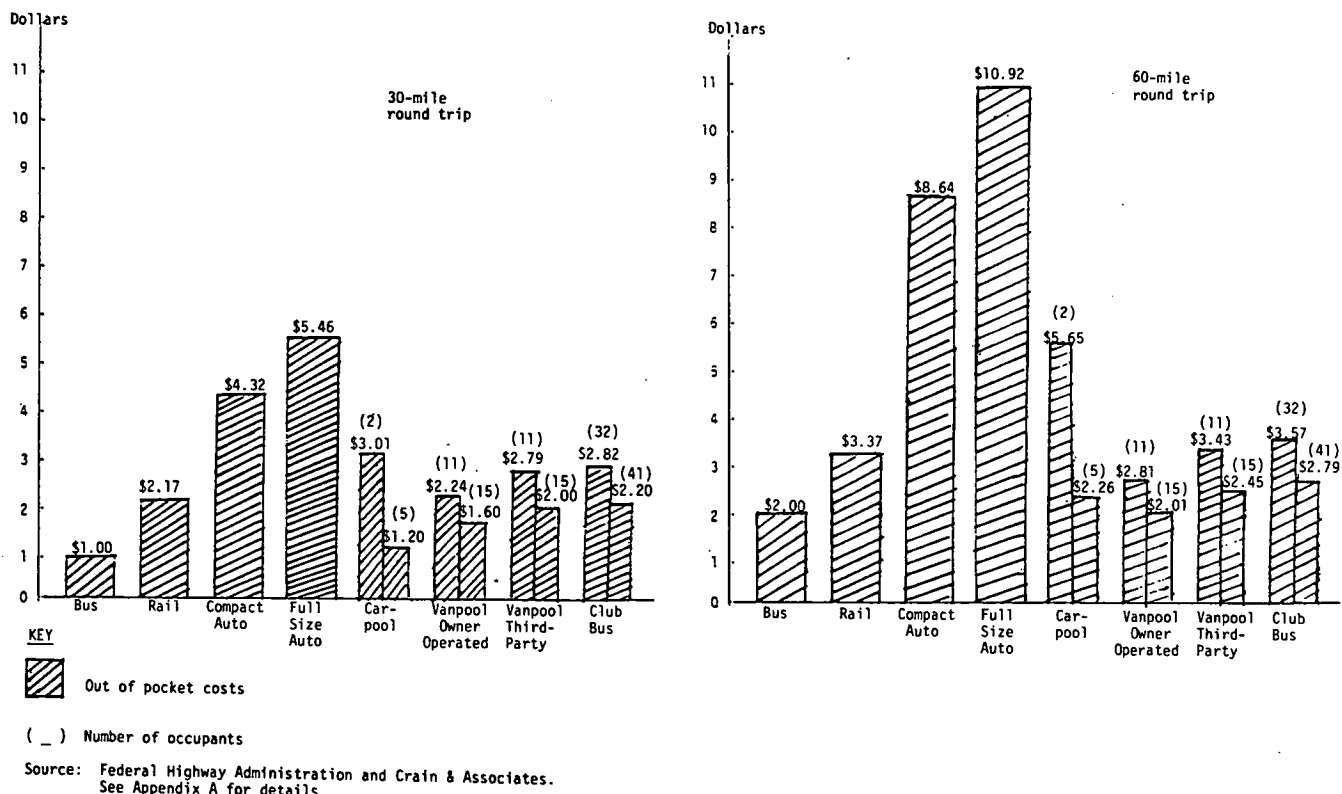


Figure 1. Illustrative costs of commuting via transit, solo auto and ridesharing modes.

Transportation Research News reported in its September/October 1980 issue that the Burroughs Corporation Michigan Van program achieved these typical monthly savings for vanpoolers compared with driving alone. "Typical monthly savings for vanpoolers compared with driving alone, are for 20 round-trip miles, \$55; for 30 round-trip miles, \$89; for 40 miles, \$122; for 60 miles, \$182; for 80 miles, \$240; and for 100 miles, \$297."

However, most drivers do not realize what it costs them to drive alone. If they do not have to pay for parking or tolls, many drivers perceive only the cost of the gasoline. Even this cost may be discounted in their minds if it is paid by credit card once a month along with other bills. For a full-sized auto, fuel is only about 40 percent of operating costs, or \$2.00 for a 30-mile round trip. To rectify such cost misperceptions, ridesharing information strategies should use cost education for those population segments that are found to be sensitive to costs.

Exhibit A shows how even modest annual ridesharing savings can accumulate over many years.

Reduced Dependence on Autos. Ridesharing can reduce dependence on a personal automobile. A car ordinarily used for commuting can be left at home half the time, or more, if the driver shares driving or joins a vanpool. Paying riders in carpools and vanpools may be able to avoid buying a car for commuting or to sell an existing one. Conoco reports that 25 percent of its vanpoolers have realized this benefit (6).

Also, paying riders in carpools and vanpools are relieved of commuting vehicle maintenance responsibilities, and even nonpaying riders may have some relief from maintenance responsibilities because of decreased use of their own vehicles. Because vanpool vehicles are generally new and well maintained, the vanpooler finds that the reliability of his commute is improved. Ridesharers are typically less vulnerable to fuel shortage emergencies because of their reduced auto dependence. This means, of course, that they are less vulnerable to waiting in line for gasoline—a "hassle factor" which to date has had a heavy impact, now compounded by the inevitable associated gas hikes.

Other User Benefits. For many persons, not having to drive in rush-hour traffic every day is a major attraction of carpooling or vanpooling. Commuting time can instead be spent more pleasantly, relaxing or socializing, and commuters can arrive at work more refreshed and ready to work. They may also enjoy such conveniences as parking close to the door, preferential access to freeways and bridges, or free passage over toll bridges.

Offsetting these benefits for some commuters are the added time requirements for picking up and dropping off pool members, the inflexibility of a fixed commuting schedule, the much disliked prospect of sometimes having to wait for others, wariness about social obligations or friction and concerns about abdicating mastery over the commute process. *A properly operated local ridesharing program should promote acceptance or alleviation of these drawbacks, as discussed in Chapters Four and Six.*

1.2.1.2 Employer Benefits

Employers can find substantial benefits in sponsoring a company ridesharing program.

Reduced Parking Costs. A significant benefit can be

The lazy man's way to riches.

How to retire at 50 and prove that life is a free ride.


How would you like to retire at the age of 50 with a free \$60,000 bank account?

Believe it or not, you can do it all the lazy way—just by ridesharing. Here's how it works.

Let's say you begin your work career at the age of 20. It doesn't matter what kind of job you start with, just be sure you get there in a carpool.

Sit back, relax, and enjoy the ride—you're on your way to retiring rich! Ridesharing may only save you \$500 dollars a year. But each year, take that \$500 and put it in a savings account at 8 percent interest, compounded, and watch how it adds up.

By the time you're 30, your account



will be worth \$7,500. At 40 you'll have \$17,500. And by the time you're 50 you'll have a "free" bank account of \$61,031.

On the other hand, put the same ridesharing savings in a mutual fund growing at a compound rate of 12 percent, and before you're 50 ridesharing may have earned you as

much as \$140,461. But let's say you don't want to retire early.

If you wait and work til 65, you could retire with as much as \$847,930.

Almost a millionaire. Just by letting a neighbor be your part-time chauffeur.

Exhibit A. *The lazy man's way to riches.* (Source: Ref. (5))

reduced need for parking. Ridesharing can reduce the capital needed for land purchase, construction, maintenance, and taxes on new employee parking facilities. Or, it can have more land available for building expansion. A prime example is a \$2.5 million savings realized by the 3M Corporation when their vanpool program avoided construction of 1500 new parking spaces (7). The Tennessee Valley Authority also saved \$10 million by reducing the need for parking and highway facilities through ridesharing (8).

In another example, the U.S. Automobile Association sold two parking lots as a result of its successful carpool program reducing the need for space. Other employers realizing parking-related benefits from ridesharing include Chrysler Canada, Nabisco, Southern New England Telephone, General Dynamics, Aetna Insurance, Yale University, Zenith Radio, Corning Glass, and Hughes Tool (9).

In general, it was found in the mid-1970s that six fewer parking spaces were needed for each vanpool formed, and about two fewer spaces for each carpool formed. The savings per space were estimated to be \$135 per year for a surface space and \$395 per year for a space in a parking structure, including the annualized cost of land and construction (10). In cases of higher than average land and construction costs, these savings could have been \$200 to \$1,000 per year higher for each space saved (8). (These 1970 estimates should be adjusted for inflation.)

Improved Access to Employees. A company ridesharing program can provide better access to expanded labor pools. For example, vanpooling helps the Winnebago Industries plant in Forest City, Iowa, to draw 70 percent of its 2,700 employees from out of town, thus tapping a widespread labor

market. IBM, near Burlington, Vermont, encourages vanpooling through preferential parking to allow workers to commute from other urban centers. General Mills in Minneapolis and Polaroid in Boston both started ridesharing programs to compensate for inadequate public transportation that caused, in the case of Polaroid, difficulty in attracting employees. Other companies that have benefited from an expanded labor market because of ridesharing include Aerospace Corporation, Digital, Hallmark Cards, General Dynamics, and TVA (9). VANGO in Maryland reports that rapid vanpool implementation rescued commuters who were losing their commuter bus service in one instance, and in another was able to serve commuters when an employer moved from Baltimore to suburban Washington (42).

In case of company relocation, ridesharing can mean retaining skilled employees instead of hiring and training a new work force. Several companies who have successfully used vanpools to retain employees after relocation are Erving Paper Mills, Brattleboro, Vt.; Prudential Insurance, Newark, N.J.; Nabisco, East Hanover, N.J.; Texico, Harrison, NY; Ralph M. Parsons, Pasadena, Cal.; AT&T Longlines; and Bell Telephone Law (8, 9).

In cases of acute congestion, ridesharing can significantly improve access to the employment site (11). It can also relieve localized congestion on access streets to the employment site. GEICO Insurance Company in Washington, D.C., improved its public image by sponsoring a company ridesharing program to reduce employee traffic on congested local streets and retain a remote labor pool (8). In an environmentally conscious area, the employer can also get a public relations boost for the resulting decrease in traffic noise, emissions, and energy use.

Other Benefits. A ridesharing program can serve as preparation for getting employees to work in case of a fuel shortage. Especially in areas with poor transit service, company ridesharing could be an important fringe benefit. Also, groups of employees arriving and departing together tend to increase security in parking lots, which could be important in high crime areas. Other potential benefits to employers from ridesharing programs include employees arriving more punctually and less fatigued.

For example, Erving Paper Mills has found its vanpoolers to be its most dependable employees, reducing absenteeism to record low levels. The 3M Corporation similarly notes that tardiness is nonexistent among its vanpoolers. Chrysler Canada reported that 27 percent of its employees who switched to vanpooling improved their attendance records; absenteeism and tardiness among vanpoolers was reduced by two-thirds (9).

Like GEICO, employers can enhance their public image through ridesharing programs. For example, the vanpooling programs at Chrysler and 3M attracted favorable articles in the local newspapers. Employees can call favorable attention to their product. Oil and utility companies have used their ridesharing programs to associate themselves with energy conservation. Insurance companies point out the safety benefits of ridesharing. Chrysler has even been able to use its vanpooling experience to promote van leases to other employers. Ridesharing can also improve employee attitudes toward the employer because employees see the company doing something for them. Through ridesharing programs,

employers can generate goodwill in government bodies because the programs are seen as responsive to government goals.

Three disbenefits sometimes perceived by employers are (1) the unfavorable consequences on morale of providing a fringe benefit only to selected staff—usually those who commute longer distances; (2) the cost and trouble of setting up a company ridesharing program, and the possibility of embarrassment if they do not succeed; (3) the belief by some employers that such programs constitute undesirable pressure on the employees; (4) the risk of losing proprietary information, or staff, to other companies from increased social contacts if the ridesharing program encourages pooling with noncompany staff. A more passive obstacle was found in a 1979 survey of 68 eastern employers (12), which concluded that most employers, and especially the majority without transportation problems, believe ridesharing has “very little appeal for their employees.”

Clearly, the prospective benefits to employers must outweigh these negative perceptions if they are to get behind ridesharing. Section 6.1 contains numerous suggestions for finding and emphasizing employer benefits.

On the average, only about 25 percent of an area's work force has been represented by employers who agree to participate (2, p. 110), and in most cases participation has been passive rather than active, without significant staff efforts to build and maintain ridesharing interest among employees. Such a low level of employer interest despite the evident benefit to employees is both a challenge and an opportunity to the local ridesharing agency.

1.2.1.3 Community, State, and National Benefits

The main benefits of ridesharing at the community level and above are reduced environmental costs, social costs, and highway and parking investment costs. Table 2 gives typical ranges of outcomes for most of these benefits from local ridesharing programs. In general, the impacts depend on the average travel distances of the area and its ridesharing potential; the larger the areas, the larger the impact. No quantitative data are available on reduction of accident costs or highway investment costs.

The magnitudes of actual reductions in VMT, energy, emissions, accidents, and parking requirements are all more or less bounded by the percentage reduction in VMT. Currently, the maximum VMT reduction achieved areawide is about 3.5 percent (2). Estimates of the maximum reduction possible through ridesharing are around 10 percent of peak hour VMT (13, 14).

Figure 2 shows the range of VMT reduced from carpool incentive and promotion programs as a function of work force exposure and capture rates. Finally, a Texas study (15, p. 1) found that annual fuel savings from vanpools of 11.2 average occupancy were about 4,600 gal, considering both the former mode of travel and how much vehicles were used when left at home. Some other sources (e.g., Commuter Pool in Seattle) estimates double or larger annual fuel savings.

1.2.2 Program Costs

The costs of a local ridesharing program can conveniently be divided into carpool, vanpool, and employer program

costs, and into start-up vs. ongoing costs. Examples of these are given in Table 3. RSA program costs include both carpool and vanpool services, in many cases, because they cannot readily be separated.

Ongoing RSA program costs are the employer-based carpool matching and promotion costs, and associated carpool placements, of 16 to 24 carpool demonstration projects reported by Wagner (16). Addition of vanpool program costs and general public information and promotion costs would increase both the costs and the benefits of the ratios, with uncertain net results. The estimated ongoing vanpool program costs of \$2,000 per vanpool found are based on limited data from one RSA and one employer. The Knoxville Com-muter Pool, operated by the University of Tennessee, apparently achieves much lower ongoing vanpool costs by sponsoring only owner-operated vans.

The lower limit of zero to nominal employer program costs is reached when the RSA does all of the promotion, match-ing, and vanpool formation among company employees, and there is no employer vanpool subsidy. Employer expenses can be limited by working with the employer to achieve the most efficient internal procedures for the specific firm. In fact, employers can achieve a net saving if sufficient parking expansion costs are avoided by the ridesharing program. The upper limits of employer carpool costs are for a moderately intensive internal carpool promotion and matching program. The upper limit of employer start-up costs for vanpools is larger than for carpools because more company involvement is often necessary to work out van purchase, insurance, driver selections, and fare collection.

1.3 SUMMARY OF RIDESHARING PROGRAM ACTIVITIES

■ This section proposes a classification scheme for all ridesharing services, three types of communication techniques, solicitation of external support, and ridesharing incentives. ■

Four categories of activities or techniques that are intended to encourage ridesharing can be identified. The first is *ridesharing services*, such as matching and transit information. The second category is *communication techniques* aimed respectively at the general public, at employers, and at their employees. The third category is *soliciting external support*, such as money and donated services, and the last is *ridesharing incentives*, such as park-and-ride pools, carpool booklets, driving hassle reduction, preferential parking, and working hour adjustments.

Table 4 presents the techniques that can be identified with-in each of the categories. Ridesharing services are covered in Section 1.4 and are treated in detail in Chapters Four and Six. The desirability of a strong consumer orientation is discussed in Section 1.5, and information needed to provide such service is covered in detail in Sections 1.5, 1.6, 4.6, and Chapter Six. Solicitation of the various types of external support is described in Section 4.5.

Ridesharing incentives are a special class of techniques designed to make ridesharing more attractive to commuters. As a distinction, *outreach techniques* are defined as active ways to gain the preliminary involvement of travelers. *Incentives* are ways to achieve their participation by making

Table 2. Typical outcomes of local ridesharing programs.

Impact Category	Reduction	Comment
Traffic (VMT)	0.03 to 3.6% in peak hour work trips	Actual impact of area shared-ride programs on work VMT (2). Predictions of maximum potential reduction in peak hour VMT of 10% in Washington, D.C. (13).
Energy Use	Impacted by: 1) VMT reduction 2) Increased mpg produced by re-duced congestion and access	Fuel saving from ridesharing depends on size of area and dependence on autos (2). Optimistic prediction of national potential is 11.5 billion gallons saved per year (14). Maximum potential of 3.5% reduction in total motor vehicle energy use is estimated in D.C. area (13).
Air Pollution	Same order of mag-nitude as VMT re-duction	
Parking	Same order of mag-nitude as VMT re-duction	Average of 26 programs was 1000 spaces, or up to 3000 spaces from considering indirectly induced ridesharing (2). Cost per space of \$135-395/year or high-er (8).

Table 3. Illustrative ridesharing program costs (as of 1977-1979).

Cost	RSA Program	Third-Party Vanpool Program	Employer Program Carpool	Employer Program Vanpool
Startup costs	Variable and not well-known	Up to \$58,000	Nominal to \$12,000	Nominal to \$30,000
Annual On-going Costs	\$0.09 to \$1.09 per commuter (average \$.42), or \$7 to \$112 per new carpool-er (average \$47), or \$.175 per VMT reduced (average \$.044)	Around \$2,000 per new vanpool	Nominal to around RSA cost levels	Around \$2,000 per new van-pool, plus subsidy

Source: 2, 7, 16, and Crain & Associates

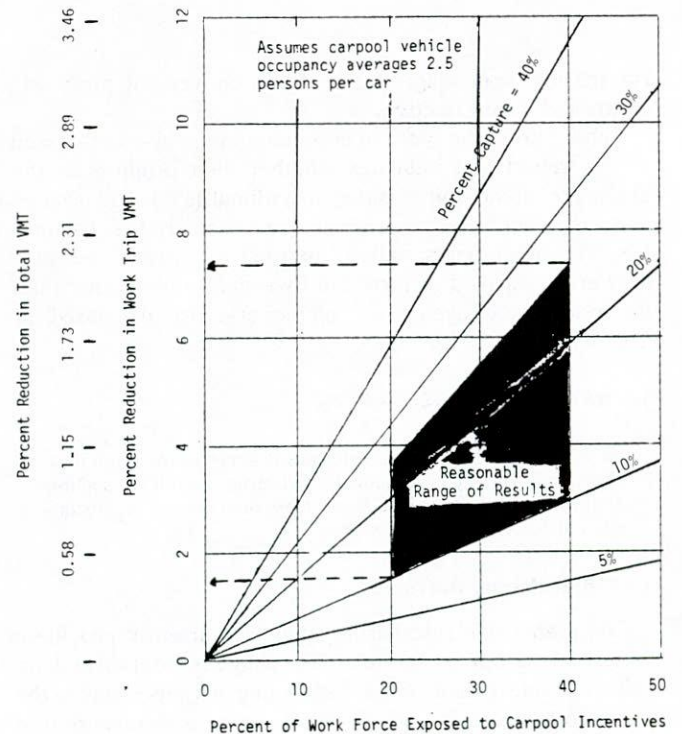


Figure 2. VMT reductions resulting from carpool incentives and promotion programs. (Source: Ref. (16))

Table 4. Six categories of ridesharing program techniques.

<p>1. RIDESHARING SERVICES</p> <p>Assistance to employers in sponsoring ridesharing</p> <p>Public information on commuting alternatives and costs</p> <p>Pool matching, familiarization, and maintenance services</p> <p>Vanpool and buspool service or brokerage</p> <p>Facilitation of community ridesharing incentives</p>	<p><u>Outreach to Employees</u></p> <p>Explanatory brochures</p> <p>Employee newsletter</p> <p>Information displays</p> <p>Employee workshops</p> <p>Company (or other) carpool coordinators</p> <p>Matching questionnaires and instructions</p> <p>Posters</p> <p>Form letters</p> <p>Bumper stickers</p> <p>Lapel buttons</p>
<p>2. COMMUNICATION TECHNIQUES</p> <p><u>For the General Public</u></p> <p>Billboards</p> <p>Highway signs</p> <p>Newspaper ads and articles.</p> <p>Radio spots and programs</p> <p>TV spots and programs</p> <p>Leaflets</p> <p>Mass mailers</p> <p>Special promotions</p> <p><u>Outreach to Employers</u></p> <p>Personal meetings</p> <p>Phone calls</p> <p>Workshops</p> <p>Explanatory brochures</p> <p>Films or slide shows</p> <p>Newsletters</p> <p>Form letters</p>	<p>3. SOLICITING EXTERNAL SUPPORT</p> <p>Money</p> <p>Loaned personnel</p> <p>Donated services</p> <p>Endorsements</p> <p>4. PROMOTING COMMUNITY RIDESHARING INCENTIVES</p> <p>(See Table 5)</p>

- Assistance to employers in sponsoring carpools, vanpools, buspools and transit use (see Section 6.1).
- Public information on commuting alternatives and costs, often including transit routes, schedules, and fares (see Sections 6.2 and 6.3).
- The all-important matching, familiarization, and maintenance assistance for public and employee ridesharing (see Sections 5.4 and 6.4).
- Vanpool and buspool service and/or brokerage offered either through employers or to individuals (see Section 6.6).
- Facilitation of ridesharing community incentives such as preferential parking and flex-time (see Section 7).

In the past, many RSAs limited their carpooling matching service to minimal information (i.e., providing ridesharing prospects with the names and business telephones of other prospects with common origins, destinations, and working hours). Carpooling results were less than gratifying. Demand for matching information remained low, and the numbers of carpools formed even lower. Such a passive approach served some commuters, but these seemed to be the readiest of first acceptors—a pool soon exhausted. More recently, in the light of experience and further research about commuter motivations, far more personalized matching techniques have begun to be tried. These are embedded in active outreach programs. The combination has proved promising.

ridesharing appealing: hassle free, convenient, traveler-controlled, cost effective.

Table 5 gives the types of community incentives discussed in this report and indicates whether their origin is at the employer, community, state, or national level. Ridesharing and employer-based incentives are considered in Chapter Six. The other types, called “indirect incentives” because they are controlled or provided by organizations other than the ridesharing agency or employers, are discussed in Chapter Seven.

1.4 NATURE OF RIDESHARING

■ RSAs can offer several ridesharing services to commuters through a variety of organizational structures. This section first identifies typical RSA services, then gives a few examples of RSA organizations. ■

1.4.1 Ridesharing Services

Comprehensive ridesharing agencies currently provide a variety of commuter services. The range is from those who offer only one (usually either carpooling or vanpooling) to the most comprehensive RSAs who serve as transportation brokers. These help solve the commuter’s transportation problem with any available mode except solo driving. In general, RSA services may include:

Table 5. Community ridesharing incentives by origin.

Incentive	Origins of Incentive			
	Employer	Community	State or National	Section Reference
1. Preferential employee parking or parking fees	X			6.2
2. Use of company vehicles	X			6.2
3. Equivalent treatment of transit riders	X			6.2
4. Model ridesharing legislation			X	7.3
5. Ridesharing subsidies, program support and promotion			X	7.3
6. Flexible working hours	X	X		7.3
7. Park-and-ride lots; preferential urban parking		X	X	7.3
8. Preferential freeway entry for high occupancy vehicles (HOVs)		X	X	7.3
9. Exclusive HOV roadways and reserved HOV lanes		X	X	7.3
10. Air quality and energy conservation regulations		X	X	7.3
11. Area of facility tolls		X		7.3
12. Parking taxes or surcharges		X		7.3
13. Gasoline taxes, rationing, and shortages			X	7.3
14. Parking supply modifications		X		7.3
15. Access restrictions		X		7.3

Vanpool matching has had a happier history, with a greater percentage of those responding forming pools, probably because the very nature of forming a vanpool requires a relatively personalized approach and has a natural leader in the driver or organizer.

Aside from providing public transit information, RSA services entail ways to encourage more use of carpools, vanpools, and buspools. These modes fall between solo driving and public transit service in many of their features: route directness, travel time, convenience, privacy, status, and cost. They were defined in 1.1, and are discussed in more detail here.

Carpools consist of persons riding together in automobiles between common origins and destinations. The carpoolers can be family members, friends (such as co-workers), or acquaintances who ride together by arrangement to either work or for other types of trips.

Carpools consist of two common types: (1) shared driving, alternating vehicles; and (2) single driver carpools.

Shared driving comprises the majority of current carpools. This may be due to a reluctance of drivers to charge enough to cover their full costs as well as the advantages of trading off the task of driving (see Table A-4 in Appendix A for pricing suggestions). Also, charging full costs would make fully commercial what is perceived also as a friendly, or cooperative, function. Service is typically door-to-door. Pool sizes vary from two to (rarely) six persons and average between two and three persons.

Carpooling is a combined business (commuting) and personal (the individual's personal car) matter. As such it offers particular conveniences and social rewards. It is also highly vulnerable to social problems because relatively few commuters are practiced in this combination. Because of this, although carpools are relatively inexpensive to arrange, without planning or maintenance assistance they often also easily dissolve.

Carpool programs may have local agency or employer sponsors. There are presently several dozen local agency carpool programs and probably several hundred employer programs, which are usually supported in turn by a local ridesharing agency. A large percentage of current carpools have arisen spontaneously in response to need, friendship, and word of mouth. Although these remain an excellent basis for the development of ridesharing, more efficient methods can be used to generate larger numbers of compatible groups with a good prognosis for survival.

Vanpool programs usually focus on the van driver, who rides free and collects fares from 8 to 14 paying riders. The driver also may be able to keep some share of the fares above a breakeven number, usually 8 to 12, as an added incentive. Fares depend on mileage and the number of riders, the driver's incentive arrangement, and any subsidy to the sponsor. They are paid by the week or month. Some vanpools allow casual riders at a daily rate on a space-available basis. There is typically some degree of custom service such as: service either from door-to-door or between convenient pick-up and dropoff points; amenities such as air conditioning and a radio; and often, custom seats and interiors. Like carpooling, vanpooling offers opportunities for socializing not found in public transit. In the vanpool, however, this is an opportunity rather than a requirement. Also, the burden of mutual interdependence is largely eliminated, at least as

far as waiting for late members, or relying on a succession of drivers who may vary in their reliability.

The principal types of vanpools are owner operated, employer sponsored, and third-party, but different variations of each type are emerging. For example, the third-party type can be a sponsored lease variation like VANGO in Maryland where vans are financed under an RSA-sponsored master lease, a brokerage operation like Knoxville's that facilitates owner-operated vans, or a transition van arrangement like Golden Gate's that provides an initial RSA-owned vehicle but requires transition to a van-RSA vehicle in a few months. Employer-sponsored programs can take the first two of these forms and two others as well:

- Employer-owned vans provided under driver agreements for employer commuting use and recovery of costs through fares—except for administrative costs and sometimes a subsidy.
- Fleet ridesharing in which the employer offers joint commuter use of its own fleet of vans or cars that are used for company business during the day.

Typical vanpool trip lengths are 20 to 40 miles one way. The destination may be either a large single employer, an industrial park, or a dense central business district.

Club bus or buspool service provides fast, point-to-point convenient service with limited pickup and destination stops. The driver of the 40-passenger (or more) bus is paid and seats are reserved. Common characteristics of buspools are (17):

- Several high density employment destinations, mostly in a central business district.
- Relatively high volume residential collection points and at least 35–50 commuters.
- Travel time within 1.5 times auto time.
- Special features, such as guaranteed seating, convenient or door-to-door delivery, express run for line haul, reclining seats, etc.
- Fares that reflect the special features.
- Constant monitoring and tailoring of service to meet demand, ensure reliability, and maintain backup service.
- Committed riders and advance periodic ticket sales.
- Greater than average commute distance (typically 20 to 60 miles one way).

Characteristics of the buspool organization typically include:

- Operation by a private or community group rather than the transit agency.
- Buses either purchased, used, or contracted from the transit agency.
- No subsidy.

1.4.2 Types of RSAs

A surprising diversity of organizational and funding arrangements has developed for state and local implementation of ridesharing services. There are successful examples of RSAs sponsored by state departments of transportation, of public works, and of energy; by counties, cities, and metropolitan planning organizations or councils of government; by public transit operators; by private nonprofit corporations

and chambers of commerce; by a university; and by different combinations of such sponsors. In addition, private companies often handle van ownership and lease them directly to the users; and consultants sometimes play a role in developing the RSA outreach program, carrying out evaluation studies, or other ways.

Table 6 gives summary information on several ridesharing agencies, chosen to illustrate a variety of sponsors from among fairly comprehensive ridesharing programs. Appendix B gives more detail on these ridesharing programs based on a questionnaire mailed to the agencies. Some general observations from Table 6 are as follows:

- Each of these agencies (or its affiliates in Denver and Boston) offers vanpool as well as carpool service.
- Buspool service is provided by RSAs numbers 4, 7, and 8; and brokerage is provided by numbers 7 and 8.
- There is a range of nearly three times in the cost per person (1976 figures) figured against total population, from \$0.02 for the second RSA listed to \$0.52 for the eighth. The cost per person for the first is much higher—\$5.33—because the divisor is only target workers rather than the total population.

1.5 CONSUMER ORIENTATION

- A strong RSA consumer orientation requires both the staff emphasis on commuter needs and preferences, and the technical skills to develop and implement a good outreach program. ■

Those programs that have relied on understanding consumer and employer needs and characteristics have had great success. Furthermore, the continuing high proportion of solo drivers in itself makes it clear that this approach to ridesharing is necessary for RSA program success. It is ideally coupled with an active outreach—seeking out client needs and preferences, seeking out clients, and then taking an active role in making ridesharing for them not only possible but attractive. The elements involved in such a program are discussed in detail in Chapter Four. The major points of a consumer orientation are:

- Establishing effective communication links with prospective clients.
- Disaggregating the population in order to understand the perceptions, preferences, and needs of the different target groups who make up the potential clients.
 - Targeting those groups in the community with programs and incentives suitable for them.
 - Maintaining feedback to, evaluation of, and necessary changes in, ridesharing promotion in order to keep the program effective.

The next section describes the characteristics of solo-driving commuters—the principal client of the RSA. But the RSA also needs the support of employers, community leaders, transportation agencies, and other groups as described in Sections 2.9, 4.5 and 4.6, 6.3, and Chapter Seven. Local data gathering techniques for program planning and evaluation are discussed in Chapters Four and Six.

The essential difference between the RSA promotion of ridesharing and other marketing efforts is that a public service activity is involved. The effort is to change attitudes and behavior in the service of directly benefiting both the individual client (e.g., commuter and employer) and the society, rather than competing for a larger share of an established market, such as for toothpaste. The acceptance of an innovation with consequent change in aspects of one's life (e.g., being on time for a pool) is a different process from buying a new brand.

The main benefits of a consumer orientation by the RSA are that more ridesharing occurs; the consumer is better served and satisfied; efficiency in maintaining pools is improved; and there is improved community commitment to ridesharing increases over time.

1.6 COMMUTER CHARACTERISTICS

- Compared with other commuters, potential ridesharers appear less dependent on autonomous use of autos, less adverse to relying on others, more irritated by driving in traffic, more concerned about environment and energy, and more interested in the monetary savings from ridesharing. ■

This section describes highlights of what is known to date about the demographic characteristics, personal attitudes, and needs of commuters who do and do not rideshare. It is presented in order to facilitate program outreach efforts and help answer the question: If ridesharing is such a beneficial mode, why is it so difficult to attract more solo drivers to it?

The general answer appears to be that the habit and attraction of affordable independent mobility are so long ingrained and powerful that very compelling reasons must be provided for people to consider and then to change their behavior. Specific answers, however, are related to traveler characteristics.

Characteristics of potential ridesharers fall into 4 classes:

1. **Demographics**—Demographics describe the tangible characteristics of the population, income level, location, etc.; in short, many of the population features that help disaggregate them into discrete subgroups so that those subgroups can be better understood.

2. **Widespread characteristics**—There are a number of characteristics, attitudes, values, and potential behavior patterns that are true of a very large part of the samples studied, such as aversion to waiting for gasoline or service, and "hassle." They appear to be powerful allies in the development of motivators for ridesharing everywhere.

3. **Regional or local characteristics**—Some characteristics are highly regional or local, sometimes determined by geographical features; e.g., availability of roads or parking. Others are cultural, such as conservatism or the need for privacy. Cultural factors are diluted somewhat by the increasing mobility of Americans. However, the persistence of cultural forces in a community or region have well established and comprehensible social psychological bases, such as reference group behavior.

4. **Occupational, educational, and social groupings**—Occupational groups (those of a given educational level and employment type) frequently take on many unique values and attitudes. Blue collar workers, for example, share very special conditions of work and life that operate toward

Table 6. Selected data on ridesharing agencies.

Agency (and Services)	Sponsor	1980 Population Served	Current Annual Cost	
			Total	Per Capita
1. Share-a-ride (brokerage; bus, schedules, personalized carpool and vanpool service)	Maryland National Capital Park and Planning Commission, Silver Spring, MD	18,000 workers	\$ 96,000	\$5.33*
2. Rideshare Office (carpools only; state highway department sponsors vanpools)	Regional Council of Governments, Denver,	1,600,000	32,900	.02
3. Houston Carshare Program (carpools, vanpool and transit information)	Metropolitan Transit	2,500,000	300,000	.12
4. TRI-MET Rideshare (carpools, vanpools, buspools, transit information)	Tri-County Metropolitan Transportation District, Portland, Oregon	1,200,000	350,000	.19
5. Masspool (carpools) and Masspool, Inc., (vanpools)	Massachusetts Department of Public Works in Boston for Masspool; Masspool, Inc. is private	2,862,000**	200,000	.07
6. RIDES for Bay Area Commuters (carpools, vanpools)	Private non-profit corporation in San Francisco	4,900,000	534,000	.11
7. Commuter Computer (carpools, vanpools, buspools, brokerage)	Private non-profit corporation in Los Angeles	10,000,000	1,900,000	.19
8. Knoxville Commuter Pool (carpools, vanpools, buspools, brokerage)	University of Tennessee, Knoxville	500,000	150,000	.30
9. MTA Rideharing (carpools) and VANGO (vanpools)	Maryland Mass Transit Administration	2,500,000	300,000	.10
10. Ridefinders (carpools, vanpools)	Pike's Peak Library District, Colorado Springs, Colorado	344,000	64,500	.19
11. Seattle/King County Commuter Pool (carpools, vanpools, flex-time, fringe and downtown parking, fleet ride)	Seattle and King County, Washington	1,500,000	790,000***	.52

*Per capita costs for Share-a-Ride are costs per targeted worker--the number listed under "estimated population served." For the other nine RSAs, total metropolitan area population is used as the divisor.

**This is the Boston area population since Boston is the main area served by Masspool even though the agency now has statewide responsibility.

***Excludes \$1.1 million van acquisition loan and \$514 thousand in operating revenues; includes \$128 thousand National Ridesharing Demonstration Program Grant

certain common attitudes and values across regional boundaries.

Social science has shed a great deal of light on those factors that influence the decision to rideshare. Some of the findings recur frequently across samples and different population segments. Others characterize only specific population segments. *It is important to emphasize that the 4-cities study demonstrated more differences by metropolitan area than by any other population segment investigated. Therefore, a significant caveat for the RSA director and policy maker is to be sure the findings discussed in this manual and in other literature as it emerges apply to their populations.* A wide range of methods for doing so is discussed in Chapter Four.

As the data base grows, it will be increasingly possible to understand the decision process and make improved projections of needed programs.

1.6.1 Commuter Types

Commuters can be divided into five categories based on their ridesharing behavior and attitudes (4). The two suggested groupings of current ridesharers are: (1) dedicated ridesharers actively interested in advancing the mode and (2) marginal ridesharers who may drive solo if their pool terminates or for other minor reasons. The challenge for the local ridesharing agency is to make the best use of the first

group's interest and to stimulate and increase the interest of the second group.

The last three groupings consist of solo drivers: (3) misinformed or passive potential ridesharers, with strong to mild interest in pooling; (4) marginal antipoolers who will become involved only if highly appropriate incentives are provided or particular disincentives are removed; and (5) dedicated solo drivers who refuse to consider ridesharing.

Clearly, a local ridesharing agency will want to concentrate in its early phases on promotion to groups 2 and 3. This effort has the benefit of providing a critical mass of active ridesharers or active enthusiasts. These contribute to a community consensus climate that is very valuable. Group 4 should be approached next if they can be distinguished from group 5 by their demographic or attitudinal features.

1.6.2 What Distinguishes Carpoolers from the Confirmed Solos?

Differing attitudes of active and potential ridesharers and confirmed solo drivers are significant and can be deeply rooted. For example, the need of potential carpoolers for autonomy in the form of their personal automobile use tends to be less than for confirmed solo drivers, who often feel that use of their personal automobile is essential to their independent way of life. The in-depth decision analysis panel (DAP) discussions of the 4-cities study indicated that very often solo drivers will initially give irregular work hours or other causes for not ridesharing when their basic reason is wanting mastery over the commute. Both groups want it, but dedicated solo drivers are more extreme in that regard and may have qualitatively different reasons for their resistance. *In short, potential ridesharers to date tend to be commuters who may choose to pool because of favorable attitudes rather than compelling situational or economic circumstances.* Others may have compelling needs and a neutral attitude toward ridesharing. Thus, the success of a program will depend significantly on increasing and communicating the positive features of ridesharing while reducing the attitudinal barriers that deter switching from solo driving.

Compared with solo drivers, potential ridesharers tend to see the disadvantages of driving alone more negatively and the advantages of ridesharing more positively. For example, carpoolers are more irritated by rush-hour traffic. On the other hand, they feel more positive about the emission and energy use reduction of ridesharing. They are more likely to believe that ridesharing yields money savings that are worth the effort. Interestingly, solo drivers tend to estimate that carpooling saves more money than carpoolers find it does. That has not turned them into ridesharers because the saving is not worth the tradeoff. This misperception on the part of solo drivers reveals the insufficiency of economics as the only motivator (4). Moreover, schedule reliability, socializing during the commute, the ability to do things while traveling are factors that appeal to potential ridesharers.

Early evidence for such observations came from Margolin and Misch's 1976 study of incentives and disincentives for carpooling based on interviews, surveys, and panel discussions with carpoolers and solo drivers in the Washington, D.C., area (4). That study reached the following conclusions regarding important differences between current carpoolers and solo drivers.

- Middle-income groups, from \$10,000 to \$30,000 annual

income, carpoled more frequently, whereas lower income groups carpoled less than half as much, and higher income groups about 9 percent less than the average for the \$10,000 to \$30,000 group.

- The primary reasons given for joining a carpool were convenience, such as similarity of location and work hours to other carpool members (33%); savings in money (25%) or gasoline (6%); helping others dependent for a ride (11%); lack of other options, such as the family's need for or preference for car (9%). Far down on the list were dislike of driving or preference for carpools (3.4%), patriotism (2%), helping others and oneself (1.1%), and safety from assault (0.6%).

- There were a number of differences between different population subsegments in their reasons for carpooling or driving solo, especially between blue collar, white collar, and managerial/executive professional groups and between men and women.

- Solo drivers tend to be more concerned with travel time, believing that carpooling slows the commute, may cause delays in leaving, and may make them late in arriving at work or returning home. They were also more concerned with the difficulty of making the arrangements necessary for carpooling. (However, further probing in interviews and decision analysis panels suggested that the higher concerns of solo drivers with travel time and with such arrangements were probably thinly disguised surrogates for (1) the greater value to them of, and the convenience and autonomy of, having the use of their own car, plus (2) a lower tolerance for delays, frustrations, uncertainty, and rigid working schedules. Again, the more objective, rational explanations are offered first, masking more basic reasons.)

The latter conclusion was confirmed by tradeoff questions. For example, 63 percent of the solos completely agreed that waiting for late carpool members "is not worth the money saved," while only 29 percent of carpoolers completely agreed with that statement, despite the perception of greater savings in a carpool by solo drivers. Another indicator is that "having a car for running errands on the way home" was more important than saving money to 52 percent of solo drivers vs. 21 percent of carpoolers.

Further support for some of these observations is provided by a 1978 survey of commuters working for New York State in Albany by Brunso and Hartgen, as part of a carpool coordinator demonstration study (19). The two principal reasons given by solo drivers for not wanting to carpool were reported as follows (answers should total 200 percent, though the high proportion of "other" answers requires further study of the questionnaire response):

REASON	RANGE OF ANSWERS FOR SIX AGENCIES(%)	SIMPLE AVERAGE(%)
1. Don't like depending on others	33-55	41
2. Work schedule not right	21-40	30
3. Don't like having to wait	12-55	25
4. Like traveling alone	5-33	18
5. Car needed for work	4-15	9
6. Cost savings too small	2-11	7
7. Can't stand smoking, music and conversation	2- 5	4
8. Bought a second car	0- 7	3
9. Other (personal circumstances, weather, etc.)	51-99	76

Notice in these responses (1) the high percentage of "other" answers (76%), coming mainly from committed solo drivers; (2) the high proportion of answers related to preferring not to depend on or travel with others (items 1, 3, and 4, totalling 84%); and (3) the low proportion (7%) who felt that the cost in savings was too small to justify pooling. Coupled with other data from the survey, these answers suggest that:

- Economic considerations are less salient to most commuters than the other factors; e.g., dependency, delay, etc.

- Solo drivers generally recognize that pooling saves money and gasoline, but in 1978 found the cost savings too small to motivate them to rideshare on that basis alone due to their apprehensions about the tradeoff, the consequences of depending on others.

- Promotion techniques and program planning aimed at solo drivers should therefore seek to tip the balance of decision-making by stressing minimization of problems related to depending on others—travel time, arriving to work on time, and convenience through carpool coordinators, carpooling rules, etc., while including (but not emphasizing) cost savings achieved through pooling. Matching and routing assures that the validity of the claims should also be provided.

- Solo drivers should also be screened as they are contacted to decide whether they are promising candidates for ridesharing promotion. Solo drivers highly resistant to ridesharing marketing (i.e., the strongly committed solo drivers) should not be misled or misused too much and resources should be focused on those more likely to respond.

Margolin and Misch (4) had the following recommendations on promotion techniques and incentives. They observed that, generally speaking, (1) the use of incentives to encourage ridesharing is far more powerful than the use of disincentives, and (2) purely impersonal methods such as computer matching programs provide very little incentive, and often strong disincentive, to prospective carpoolers. In their place, they recommend both (1) *more emphasis on positive incentives, such as preferential parking and high occupancy vehicle lanes* and (2) *more personalized matching techniques, particularly facilitating the introduction of potential carpoolers and facilitating carpool agreements covering smoking, running errands, and other concerns of carpool members.*

They also suggested that:

- The carpool program should concentrate on appeals that are appropriate to particular subsegments of the population, such as occupation type and conditions, experience with carpooling, size of employment site, age, income, sex, and length of commute that are more favorably inclined to ridesharing.

- Local site carpool coordinators should be appointed, either at the work site or home end, to assist in recruitment of new ridesharers, introduction or familiarization of prospective ridesharers, and maintenance of existing pools.

- A "How to Carpool" handbook should be prepared and used as a part of the enrollment campaign and assistance to continue carpooling, along with a carpool coordinator's handbook (see Ref. 20 for an example of these).

These conclusions are also supported by the findings of Horowitz and Sheth (21) and Dobson and Tischer (22). Chapters Four, Six, and Seven of this manual give further details on ridesharing incentives, and Section 3.4 deals with personalized matching. The findings of the 4-cities study about attitudes of solo drivers in general are covered in Section 1.6.4.

1.6.3 Vanpoolers

The characteristics of vanpoolers have been less thoroughly researched, but several points stand out from a 1978 Commuter Computer survey of vanpoolers in Los Angeles (23):

- Whereas 72 percent of new carpoolers were former solo drivers, only 37 percent of vanpoolers formerly drove solo. This suggests more extensive prior vanpooler experience with ridesharing (including transit use). Further analysis showed solo driving as the most frequent prior rider mode and carpooling as the most frequent prior driver mode:

PRIOR MODE	RIDER (%)	DRIVER (%)
Drive alone	40	32
Carpool	23	41
Bus	32	27
Other	5	0

- Vanpoolers tended to travel farther to work than other commuters, an average of 72 miles roundtrip, compared with 45 miles for carpoolers and 19 miles for all commuters.

- Vehicle ownership is 1.8 per household for vanpoolers, close to the regional average of 1.77; but drivers tend to own a lower number (average 1.75) than riders (1.92). Only about one-third of the drivers and one-fourth of the riders have changed their vehicle ownership or purchasing decisions, either selling a vehicle (4% in total) or deferring replacement (26% in total). One reason for these figures may be that nearly half of the vanpoolers in the 1978 California study still use their own vehicle to drive to the pickup point, since the vanpool routing practice was to strike a balance between individual pickups and diversions from a direct route to work.

- The household income of vanpoolers averaged \$33,000 per year, compared with a median household income of about \$13,000 for the population as a whole, and individual vanpooler average income of about \$25,000. Drivers had lower incomes, about \$29,000 on the average compared with \$33,500 for riders. Vanpoolers also tended to occupy somewhat more responsible or higher status positions (executive, manager, etc.) than carpoolers.

- The following reasons were given for initially deciding to vanpool:

REASON	RIDERS(%)	DRIVERS(%)
Not having to drive	25	
Convenience	15	
Reduced cost	14	40
Save wear on car		36
Other	46	24

While the “other” category is large and, therefore, requires further study, these responses at least suggest a low emphasis on cost savings by riders compared with drivers, and a high irritation with driving by riders.

- About 38 percent of vanpool riders were referred to the program through personal contacts, while 29 percent responded to a company presentation and only 19 percent to advertising.

- Vanpooler satisfaction with the service was over 90 percent, with the reasons for satisfaction differing according to the former mode of the vanpooler. Former carpoolers and transit users stressed comfort, convenience, time savings, and development of new friends as important benefits. Former solo drivers valued monetary benefits more highly than former carpoolers and transit users, at the expense of other characteristics.

One Commuter Computer comment on the vanpooler survey results was that most vanpoolers in that expensive system appeared predisposed to rideshare and willing to pay the higher costs of this vanpooling program for its convenience. A second comment was that although more data are needed on vanpooler attitudes to improve program outreach, it already seems clear that (1) personal promotion and word-of-mouth contacts are much more effective than advertising and (2) to greatly broaden the vanpool market beyond its present small clientele would require significant cost reductions. The authors of this manual concur, but note on this last point that Commuter Computer’s 10-passenger “luxury” vans tend to have lower occupancies and hence higher costs per rider than do some other systems. Their high costs must also tend to select higher income persons for riders than may be true for other systems. They offer one example of the variety of ridesharing programs.

In addition to the characteristics of carpoolers and vanpoolers just referred to, a number of conditions such as long commute distances and high parking costs are typically associated with successful prospects for ridesharing marketing efforts.

1.6.4 Attitudes of Solo Drivers From 4 Cities

The 4 cities in this study were selected for their differences (see Appendix D for details) in order to provide exemplars of transportation situations in the United States. They are neither a random nor a stratified sample of U.S. metropolitan areas. Therefore, generalization from these findings must be limited. In this section, pooled data from the 4 sites are summarized to familiarize the reader with the most frequently recurring solo driver attitudes found to date. RSA personnel need to be alert to these common attitudes, but also to the variations from them that may characterize their own communities. Precisely because most differences in the study occurred by metropolitan area, further investigation of the commuters in any other locale is needed before effective program strategies for that locale can be determined.

1.6.4.1 Demographics and How Solo Drivers View Their Commutes

When the total sample from the 4-cities study is considered together, the typical solo driver in this study is moderately

mature (age 31 through 40) and comes from a moderately prosperous household (income in the \$21,000/year to \$30,000/year range). This commuter lives just under 16 miles from work in a household that enjoys a nearly one-to-one ratio of cars to licensed drivers, and finds parking at or near work with no problem. Half the sample has had some carpooling experience in the past, although fewer than 2 percent have ever vanpooled.

The commuters in this study appear well entrenched in solo driving and the convenient errand running that having a nearly one-to-one ratio of household cars to drivers allows. They report running work-related errands with their own cars on the average a little less than twice a week, and personal errands (on the way to and from work or during the lunch hour) a little more than twice a week. Only a few more than half of these suburban residents perceive they have any alternative to driving alone to work (i.e., for just under a half, even carpooling does not come to mind). Flex-time, which may or may not interfere with ridesharing depending on how the commuter arranges matters, involves 30 percent of this sample.

1.6.4.2 Complaints About the Commute

These were in response to an open-ended question. In contrast to 5 years ago when spontaneous complaints focused almost exclusively on congested traffic, today’s solo drivers are concerned with both congestion and rising commute costs, mainly the price of gasoline. (They are also irritated by a number of other problems, ranging from their own schedule difficulties, to family transportation needs, to harassments other than congestion.) However, in using budget appeals, ridesharing programs should be careful to avoid implying in any way that the commuter is to blame for financial difficulties: 60 percent feel that gas price increases are due only to government or industry manipulation, a sense of victimization that generates widespread anger.

1.6.4.3 Prime Concerns—“Hassle” and Costs

“Hassle” appears to be a universal and potent factor. A majority of the items elicited high concern (50% through 75%) with no variation by metropolitan area. Most of these items embed uncertainty in some form. The responses show clearly that solo drivers insist on a reliable commute that is as surprise-free as possible. They will trade the hassles of solo driving for ridesharing only if it offers very comfortable certainty about the daily commute.

In favor of ridesharing are the facts that a large majority like the idea of vanpooling because auto repairs are avoided, and a large majority find it would be worth leaving earlier in the morning to rideshare in order to avoid having to go so often to gas stations to buy gas. A little over half feel that gaining access to an HOV lane for a sizable part of the commute would make it worth having to depend on others to get to work. Finally, four-fifths would not mind at all making a minimal detour (one mile) to pick up pool members.

On the other hand, the hassles perceived in ridesharing bother solo drivers greatly. Large majorities believe that (1) vanpooling is bad because of the risk of missing the ride and having to find another way to get to work that day, and (2) both carpooling and vanpooling are difficult to arrange—an

aggravation in itself. Carpooling is rejected by a little more than one-half on the basis that the cost benefits are not worth the trouble of having to wait sometimes for late members.

Interestingly, some solo drivers perceive a risk of being late to work even driving alone (17%). This increases to over a third who would worry about it if they vanpooled, and nearly a half if they carpoled—clearly a substantial barrier at present to their considering ridesharing a workable option.

Finally, and in tune with the worry about being late even while solo driving and the congestion complaints, a fifth to a quarter find that commuting to work in itself is a hassle (“not a relaxing ride”), regardless of mode. All in all, emphasizing freedom from specific solo driving hassles for those who rideshare will be an effective program approach as long as the hassles solo drivers fear in ridesharing are dealt with.

Although cost is an increasing concern of solo drivers, by itself it is not yet enough to overcome the reluctance to rideshare.

This sample paid an average of \$64/month for the gasoline to commute in 1980 and anticipated increasing costs. (Parking for the urban-employed added another \$19+/month. For most of the suburban-employed it was free.) The gas cost savings ridesharing offers are certainly well understood. Nearly all (94%) rated the gas expensive when driving alone to work, whereas only a little more than half consider that true of carpooling and less than half of vanpooling. Nevertheless, 41 percent of the total sample maintained that even for vanpooling the gas is expensive. The finding underscores the considerable gas cost sensitivity operating among today’s solo drivers.

Most of the strongest cost concerns (60 percent or more expressing concern) relate to prospective, rather than actual, costs. These include:

- Finding vanpooling good because many auto repairs are avoided (mixed with hassle concerns).
- Willingness to rideshare if that were the only way to gain free parking.
- Interest in leaving a little earlier in the morning to rideshare and, so, avoiding going to gas stations so often to buy gas (also mixed with hassle).
- Increasing predictions that they would rideshare if the price of gas rose to (a) \$1.75/gal, (b) \$2.00/gal, or (c) \$2.50/gal (note that these findings do not predict actual future behavior, but rather provide a sensitive measure of present attitudes).

However, cost concerns drop, as they did 5 years ago, when the dollar savings are considered in relation to ridesharing drawbacks. Just under a half of these solo drivers will say that saving money by ridesharing is more important than having the car to run errands on the way to and from work. Even fewer think the money saved is worth having to depend on others for the commute. Only a third find the financial gain worth having to wait sometimes for late carpool members. (However, this third is a greater proportion than 5 years ago, demonstrating again that cost concerns have been growing even in relation to the most widespread complaint about carpooling.)

1.6.4.4 Important Social and Personal Factors

Neither carpooling nor vanpooling is considered an imper-

sonal commute mode by solo drivers. It is no surprise, therefore, that social concerns about ridesharing remain as prime today as they were in a study of carpooling 5 years ago (4). This is particularly true of the very personal matter of match methods.

1.6.4.5 Ridesharing—A Social Prospect

Many solo drivers see the opportunity to socialize during the commute in a vanpool or a carpool as a great advantage. However, they will not tolerate being placed in a ridesharing group without having some control over what that social situation will be like.

Over 80 percent find that ridesharing is a pleasant way to meet new people after a change in home or job locations (so frequent for so many Americans). Nevertheless, over 70 percent insist on meeting people at least once before they would agree to carpool. Although the vanpool is not seen as creating as sensitive a social setting, well over half set the same requirement before they would commit themselves to one. A minority (28%) are socially very conservative, indeed, and would only carpool with people they know well, and 20 percent hold to that criterion for vanpooling. When the matter is approached from another angle, a majority would rideshare in either mode only with people from their own neighborhood—a requirement that might have something to do with pickup times, but that in this era of homogenized suburbs certainly increases the chance of a pool in which one will be comfortable socially. Finally, some solo drivers are either not interested at all in companionship during the commute or very wary of involvement: 29 percent said that vanpools are preferable to carpools because it is possible to choose whether or not to socialize.

Most people really prefer not to cross major job barriers when they commute, particularly (but not only) in carpools. The survey picked up only a third who were willing to say in the interview that they prefer to rideshare with people at a similar job level. However, the decision analysis panels elicited the same hesitant finding only until sympathetic discussion had continued long enough to make everyone comfortable about expressing such an “undemocratic” notion. Then the dislike and discomfort were clearly expressed indeed. (Surveys are simply not fine-tuned enough to pick up such delicate matters.) Programs will be well advised to be sensitive to such discomforts.

1.6.4.6 The Match Process

Vanpooling is considered difficult to make arrangements for by 60 percent of these solo drivers. (Because that nearly duplicates the 59 percent who think the same of carpools, it is possible that perceptions of the far better known carpooling are coloring ideas of vanpooling.) Very few solo drivers would want to organize a vanpool themselves, but 60 percent would join a neighborhood van if they were going to vanpool, and 79 percent would join one organized where they work. The much greater endorsement of employer van programs probably reflects confidence about the reliability and stability of employer programs. However, the concern about neighborhood vanpools is not extreme since so many endorse them, probably indicating again the social requirements over which solo drivers want control.

That carpools are perceived as difficult to arrange by so many may be because of the way solo drivers today think of

their size. Five years ago their preference was for the smallest, that is, two-person carpools. Today the median number preferred is four. It is as though these solo drivers are saying that if they have to give up driving alone, they might as well realize the greatest cost benefits and hassle reductions possible.

Seven carpool match methods were tested with results that repeat those of an earlier study (4). If these solo drivers were going to carpool, they would want the process personalized, as well as substantial amounts of help. Impersonal methods or those involving little program outreach were low on the list: only 25 percent would consider forming a pool by themselves, 33 percent would send their names into a central computer to obtain a match list, and 40 percent would use a locator list where they work. In contrast, 63 percent would be interested in being called by someone forming a pool; 74 percent would like the help of a neighborhood coordinator, and 78 percent would like the help of a worksite coordinator. These findings are widespread, with few differences among cities, occupation groups, etc.

1.6.4.7 Concerns About Status

It appears that ridesharing in itself is not seen as lowering the solo driver's status. Although nearly three-fifths think that people who are financially well off tend not to rideshare, only a few more than a quarter consider that switching to vanpooling or to carpooling would mean reducing their lifestyle—evidently, these solo drivers simply do not consider themselves financially well off. The important status concerns are social and have already been discussed: a majority would prefer others in either type of pool to be from their own neighborhood, and the decision analysis panels revealed the strong reluctance to rideshare with people at very different job levels. What this means is that solo drivers want to preserve their present status in the sense of associating with people like themselves. They will draw the lines where they want them, or they will not rideshare.

One additional point should be mentioned. Only 19 percent would say that it would be embarrassing to have to excuse one's self in front of other people at work to meet a carpool or vanpool. This is understandable for the blue and white collar employees, subject to the timeclock and expected to leave promptly at the end of the day. For the managerial/executive/professional (MEP) group, however, the finding appears due to sampling bias. Solo drivers who considered ridesharing impossible because they "have" to stay late probably tended to refrain from volunteering for the survey. Certainly discussions in MEP Panels made it obvious that this is often an acutely embarrassing matter, unless company policy and custom legitimize it. Stated policy is not enough. It is only when the company president, the division chief, or other powerful officers actually leave on time to rideshare that it becomes legitimate for other MEPs. As one government employee put it, "Yes, it's supposed to be all right to leave at five no matter what's going on to meet your pool, and no you don't get promoted if you do."

1.6.4.8 Mastery Over the Commute vs. Independence of Others

Contrary to popular notion, independence of others during the commute did not emerge as an important concern. As

noted earlier, less than half the total sample felt that depending on others is not worth the money saved by carpooling. Only between a quarter and a third thought that (1) an HOV lane for a substantial part of the commute would not be worth having to depend on others, or that (2) it would not be worth depending on others to rideshare in order to maintain a guaranteed parking place at work.

However, willingness to depend on others does not make for passivity about the commute, quite the contrary. Needs for mastery are sharper when the solo driver will not be the only person involved. Mastery concerns were shown in the high ratings ranging from 57 percent to 74 percent on the relevant items, some of which favor ridesharing and some of which do not. Nearly three-quarters of these solo drivers feel better driving their own car to work than being driven. Very large majorities prefer carpooling to vanpooling both because they can have more to say about all the arrangements and because they would really be bothered not to have their cars available for their immediate use during the day. Just under three-fifths like to drive alone both because they find it important to be able to relax by themselves and because they also find it a pleasure to have their own car in order to enjoy driving it home. When mastery is traded off against mastery in a comparison of separate items, many solo drivers opt for it in either case. Nearly three-fifths would enjoy the feeling of being picked up at home "by a chauffeured vanpool." When the matter is put another way, about the same number agree that what they do not like about vanpooling is that it is too much like a bus: "the driver runs the show and you have to keep to their schedule, not yours."

Clearly, effective ridesharing programs will have to emphasize the mastery opportunities of carpools and vanpools: control over runaway costs, over increasing hassles, over type of companionship, etc. Anything that hints at passivity will be counterproductive (with the exception of some specific target groups on specific issues discussed below). A vanpool appeal to "leave the driving to us" will turn away the very solo drivers who would respond to "leave the traffic snarls to us as we chauffeur you to work."

1.6.4.9 Convenience

The question here was how tied solo drivers are to the convenience their own cars offer for running all manner of errands and for being able to change plans (and travel destinations) with little notice. The answer is that the convenience can be sacrificed, but only reluctantly. Nearly three-fifths would be really bothered not to have their cars available for their immediate use. About as many downgrade both vanpooling and carpooling for lack of space for briefcases and packages. On the other hand, only two-fifths consider that the immediate availability of the car is more important than the cash savings made possible by ridesharing, and the sample as a whole is running errands at lunchtime or on the way home only twice a week. There is solid backing for compromising via a mode split: 53 percent would rideshare to a safe (it must be safe) park-and-ride lot in order to have their cars available before arriving home to "run errands, meet friends, etc." This proportion represents a startling reversal of the usual flat rejection of mode splits by solo drivers, and suggests an important program strategy. (That the strategy would not work unless the lots were really safe from vandals and muggers was made abundantly clear in the Panels.)

1.6.4.10 Parking and Safety

Parking is confirmed once again as a critical issue. In relation to ridesharing, 64 percent would switch to it if that were the only way to get free parking at work, and 58 percent would do so to keep a guaranteed parking spot there. The majority who would want to drive to a safe lot to meet a pool if one were going to rideshare has just been discussed. The only item that fell below the 50 percent mark was just below: 47 percent would rideshare for highly preferred parking (within 200 ft of the work entrance). In the Panels held in each city with employers, all organizations made it clear that they do not consider removing solo parking privileges a viable option. The issue is too sensitive. They fear lowered morale, loss of valued employees to competitors, and triggering union problems.

With the exception of the interest in a safe park-and-ride lot, safety does not emerge as an issue of high concern and certainly not in ridesharing. Although a little more than a third are concerned about assault when they drive alone as they do now, the figures drop to 19 percent and 17 percent for carpooling and vanpooling. Waiting on the street at the end of the day for a pool, or relying on the skills of someone else driving, elicit more concern, but these do not go much over the 30 percent mark. (Relying on another driver's skill causes a bit more concern than the possibility of being assaulted on the street.)

1.6.4.11 When Solo Drivers Rate Their Own Ridesharing Potential

Nonsolo driving mode preferences were tested in open and in forced choice items. The forced choice produced 56 percent preferring carpools, 20 percent the less familiar vanpools, 15 percent bus travel, and 9 percent subways, if all of these were available as options. Over three-quarters "vote" for private transportation here. Panel findings suggest that despite the monetary bargain represented by buses and subways, the "hand tailoring" possible in ridesharing, combined with dislike of finding one's self part of a large and impersonal mass of commuters, are the critical factors. If vanpooling appears poorly endorsed, this may be due to its unfamiliarity to this sample. When experience and forced choice interest are considered together, roughly as many solo drivers selected carpooling as have carpooled. In contrast, about a fifth more endorse vanpooling as have vanpooled, indicating considerable potential.

Solo drivers were then polled separately about their interest in vanpooling now and in carpooling now; 37 percent indicated positive interest in the first and 44 percent in the second mode. (Probable or definite lack of interest was expressed by 51 percent for vanpooling and 42 percent for carpooling.) While some positive response bias cannot be ruled out, there is clearly serious potential for both ridesharing modes among today's solo drivers—particularly in the light of their cost and hassle concerns, and the positive social appeal of ridesharing—as long as solo drivers are helped with active outreach programs that allow them considerable say in the matter of who makes up the pool.

1.6.4.12 Ridesharing Program Experience

This sample indicates that carpool programs (which more

had experienced) have been more initially successful. In the total sample, 36 percent could say that they had been exposed to a carpool campaign in the past, and of those (267 solo drivers) 22 percent had carpooled as a result: a high response rate and a high dropout rate. Substantially fewer, 25 percent, had been exposed to a vanpool campaign in the past and, of these (206 solo drivers), only 5.3 percent had vanpooled as a result.

1.6.4.13 Carpool and Vehicle Size

As mentioned earlier, these solo drivers think in terms of large carpools when they consider traveling to work that way (median number preferred is four). Their concerns about vehicle size match this. If they were going to carpool, 85 percent would do so if all the cars in the pool were luxury or standard size, vs. 77 percent when intermediate size cars are involved (this appears to be the significant cutoff). The interest drops to 44 percent when compacts and subcompacts enter the picture. Americans are now buying smaller cars in increasing numbers as one way to deal with the escalating costs of gas. Carpooling may well offer another while preserving the greater comfort of the larger vehicles that are desired by solo drivers if they are to share rides in their own cars. The attitudes and motivations of particular target groups of solo drivers derived from the 4-cities study carried out in preparation for this manual are discussed in Chapter Four.

1.7 COMPATIBILITY WITH OTHER TSM STRATEGIES

Ridesharing is one of a large spectrum of TSM actions. The following tabulation summarizes the relationship between ridesharing and other types of TSM actions:

TYPE OF TSM ACTION	EFFECT OF ACTION ON RIDESHARING	EFFECT OF RIDESHARING ON ACTION
Improvement in traffic operations or vehicular flow	Reduces one incentive to rideshare	Reduces need for action
Reducing peak-period travel demands (except flexible working hours)	Reduces one incentive to rideshare	Reduces need for action
Improvements in transit paratransit service, marketing and efficiency	Neutral to the longer commutes served by most ridesharing	Decreases transit peak-load problems and need for major expansion of transit facilities
Improvement in pedestrian and bicycle facilities	Probably neutral	Probably neutral
Flexible working hours	Encouragement	Probably neutral
Priority (or preferential) techniques for high-occupancy vehicles	Encouragement	Supports by taking advantage of opportunity
Parking management	Encouragement	Reduces negative impact of action on commuter

It appears that the first three types of TSM actions (improved traffic operations, reduced peak-period traffic demands, and transit improvements) will reduce some incen-

tives to rideshare. Improved pedestrian and bicycle facilities probably have a neutral effect. The last three (flexible work hours, priority treatment of high-occupancy vehicles (HOVs), and parking management) can encourage ridesharing. For that reason, these TSM actions are covered in Chapter Seven.

In terms of the effects of ridesharing on the TSM actions, ridesharing reduces the need for the first two measures; is probably neutral with respect to improved pedestrian and bicycle facilities and flexible work hours, and complements the last two measures. The most serious source of potential conflict is between ridesharing and transit patronage, inasmuch as some new ridesharers are former transit users. This is to be expected because ridesharing usually saves travel time compared with public transit, at a lower cost than solo driving. However, there are many situations in which vanpooling, carpooling, and transit do not compete, but complement each other because: (1) each tends to appeal to people with different commute trip lengths, and (2) most ridesharing serves rush hour trips and thus reduces the peaking which is so expensive for public transit to serve. Dalton and Deslauriers found this to be so in their study of ridesharing at the Ontario Ministry of Transportation and Communication (24). In addition, reserved pool parking at rail heads can increase transit use.

As one protective measure, Section 126(g) of the Surface Transportation Act of 1978 prevents the Secretary of Transportation from approving ridesharing projects that will have "an adverse effect on any mass transportation system." However, whether the loss of some transit patronage to ridesharing is acceptable competition to the transit system depends very much on circumstances and attitudes. For example, in the Golden Gate Bridge, Highway and Transportation District's ridesharing program, carpooling is encouraged and vanpool and buspool services are offered by the bridge district because all three reduce both the peak-period congestion on the bridge and the cost of providing subsidized conventional transit service. In transportation brokerage programs such as those of Knoxville's, Computer Pool and Silver Spring Share-a-Ride, the objective is to move commuters efficiently to work by conventional transit, express buses, vanpools, and carpools, in the most appropriate applications for each type of service. The brokerage approach to ridesharing that is recommended in Section 3.2 of this manual takes the same tack. It is believed that conflict between ridesharing and transit services will be minimal, with a brokerage approach, which entails providing transit information along with other ridesharing services in the best interests of the commuter.

For further details on TSM actions, consult Refs. (25, 26, 27, and 28).

1.8 SOURCES OF INFORMATION AND TECHNICAL ASSISTANCE

Table 7 gives the principal national sources on ridesharing information. Inquiries to these sources will provide a small library of ridesharing materials at little cost. The comments include suggestions for specific references to request.

The availability of technical assistance from the agencies given in Table 7 varies according to their resources and other commitments. The state ridesharing office, if any, is the most

Table 7. National sources of ridesharing information.

Ridesharing Branch Public Transportation Management Division (HHP-33) Federal Highway Administration* (202) 426-0210	Ask for references 29, 30, 31, 32, 7, 4, 2, and 8, and to be put on the mailing list for 33.
Office of Service and Methods Demonstrations (UPM-30) Urban Mass Transit Administration* (202) 426-4984	Useful for information on vanpools, brokerage, and transit integration.
National Ridesharing Information Center Room 4432 FHA* (800) 424-9184	A clearinghouse for federal ridesharing information.
Office of Technology Sharing Transportation Systems Center Kendall Square, Cambridge, MA 02142 (617) 494-2486 or (800) 225-1612	Ask for references 34 and 35.
Office of State and Local Assistance Programs, Department of Energy (CE-20) 1000 Independence Ave., S.W. Washington, D.C. 20585 (202) 252-9345	Ask for references 36 on ridesharing impediments and for references 37, 39, 14 and 58, 39 and 40 on vanpooling.
Transportation Research Board 2101 Constitution Ave., N.W. Washington, D.C. 20418	Publishes reference 41 periodically, plus various technical papers and reports.
The National Association of Vanpool Operators (NAVPO) 12208 W. Kingsgate Drive Knoxville, Tennessee (615) 966-4507	Publications available only on joining the Association; write or call for information.
Association of Ridesharing Professionals c/o Ridesharing Division P.O. Box 9000, Presidio Station San Francisco, CA 94129	Annual membership \$25.00.

*400 7th Street, S.W., Washington, D.C. 20590

logical source or assistance. Even without a state ridesharing office, the state department of transportation or highways or energy may house someone who is responsible for keeping up with or promoting ridesharing programs. When there is no state ridesharing person, national sources or consultants—who can be identified by those sources—may be of assistance.

The FHWA Ridesharing Branch and the National Ridesharing Information Center are excellent sources of information for computer matching, for local ridesharing programs, and for carpool information, while the Department of Energy specializes in vanpooling. Vanpooling information and technical assistance are also available from NAVPO. Carpooling technical assistance is available without cost, resources permitting, either from FHWA or from contractors hired by FHWA for that purpose.

Other local ridesharing agencies and some universities are also prospective sources of information concerning successful ridesharing techniques. The addresses of local agencies are listed in Ref. (8). The following universities have recently had one or more faculty members especially active in ridesharing research or technical assistance: The George Washington University, Washington, D.C.; University of Illinois at Chicago Circle, Chicago, IL; Massachusetts Institute of Technology, Cambridge, MA; University of New Mexico Energy Institute, Albuquerque, NM; University of Tennessee Transportation Center, Knoxville, TN; Texas A&M, College Station, TX; University of Washington, Seattle, WA. The appendix to Ref. (34) elaborates on research activities at these and other universities.

Requests for assistance from the urban and regional planning or transportation departments of a local university or

from the university's office of the president may locate a professor with the necessary skills or suggest the importance of the activity to them possibly leading to new sources of assistance.

FHWA, UMTA, and the Office of the Secretary of Transportation sponsor demonstration projects to evaluate and publicize promising ridesharing incentives and techniques; for example, seventeen were sponsored in 1979. In addition,

DOT in 1979 engaged a public relations firm to develop national ridesharing marketing concepts and materials. Details on both activities can be requested from FHWA's Ridesharing Branch or UMTA's Office of Service and Methods Demonstrations, or the National Ridesharing Information Center. Sources of ridesharing financial assistance are covered in Section 4.5 of this manual.

CHAPTER TWO

COMMUNITY CONDITIONS ASSOCIATED WITH RIDESHARING SUCCESS

This chapter is concerned with community conditions that affect ridesharing. There is some overlap with the discussion in Chapter One—parking, for instance, is both a community condition and an intense commuter concern. However, the focus is quite different. It is on the community as the policy maker and how RSA staff must deal with it.

The first of five conditions is type of transportation problems (fuel shortages, increasing fuel costs, parking, highway congestion, level of transit service, and commute distances). The next condition involves varied program settings. Working hours (whether standard, or stabilized flex-time) follows. After this comes a quite different kind of community condition, the social climate for ridesharing. Here are sketched those sociological forces which help shape the demands solo drivers will make, in one community vs. in another, before they will use these collaborative, social modes. Because the concept of social climate is new to many policy and program staffs and little past research has addressed it, a guide to assessing local social climates is included. The chapter closes with regulatory and political factors. Note that working hours and the social climate for ridesharing may vary within a large enough metropolitan area.

2.1 FUEL SHORTAGES

- Good planning can assure that transportation emergencies will become opportunities rather than problems for the RSA. ■

Recent events have proven that gasoline shortages are both possible and of acute concern to commuters and to government officials. Urban areas are also subject to other types of transportation crises, for example, public transit strikes or other breakdowns of service. These events usually create sudden growth in ridesharing applications, which is good if the local ridesharing agency is prepared and a problem if it is not. For example, the RSA can use the prospect of such transportation emergencies as a powerful means to reach and gain the support of company management, because it protects their interest. Hence, the likelihood and

probable consequences of transportation crises should be identified early on, so that the planning and operation of the RSA can take them into account.

When such a transportation crisis occurs, a well-prepared RSA can gain large amounts of free publicity, can build up its files of applicants, and can help alleviate the crisis through increased matching of ridesharers. It must be recognized, however, that these crises will require major deviations from standard operating procedures. If the RSA has prepared good contingency procedures, as are described in Section 4.8, then these emergencies can be handled with few problems and to everyone's benefit.

2.2 INCREASING COST OF FUEL

- Rising fuel prices and consumer anticipation that they will continue to escalate make cost a more important motivation for ridesharing than it was in the past. However, consumer anger at the situation means that cost appeals must be handled delicately. ■

In the past, economic motivation alone did not provide enough incentive to rideshare for any sizable majority of metropolitan solo drivers. Margolin and Misch (4) detailed the reasons for this that were current in 1975, and discussed how such issues as avoiding relying on others, physical comfort, and interpersonal concerns were significant in why most people commuted alone.

The current high inflation rates and the rising cost of fuel is now changing this situation to some extent. Section 1.6 presented findings from the 4-cities study showing that serious worries about prospective cost increases are concerning more and more solo drivers. This is most marked for the economically more marginal ones in the community as the target group findings presented in Appendix D document. These groups include not only those in their middle years whose incomes are at, or below, the national average (largely blue and white collar households), but young couples struggling financially in the attempt to establish households and families, and even the relatively prosperous who face immi-

ment retirement with its drop in income. Economic pressure today is increasing interest in the possibility of ridesharing. Nevertheless, many resist giving up the solo drive as long as possible or until the opportunity to rideshare on their own terms is offered. The widespread sense of being victimized by manipulated gas shortages and consequent price hikes does not help. In fact, it has created so much anger among the 60 percent of those surveyed who agree that this is what occurs, that any cost savings appeals which are perceived as blaming solo drivers will provoke severe backlash. Savings should simply be presented as one of the many benefits ridesharing offers those who care to take advantage of it.

In order to tailor cost savings appeals most effectively according to community and to target groups, see the discussion of the 4-cities study findings in Appendix D. The RSA will need to continue to stay in close touch with general consumer concerns about fuel prices and inflation as these shift over time. Equally important will be the economic fate and attitudes of various age and occupation groups in the community as such economic conditions change.

2.3 SHORTAGE OR HIGH COST OF PARKING

■ Parking shortages and perceived high parking costs are two of the most important motivations for ridesharing, but they are not simple to utilize. Private sector employers are in no position to impose solo parking bans, and commuters adjust to high costs when these occur gradually. ■

The employee problems associated with limited or high cost parking provide a strong incentive for employers to consider ridesharing programs. These parking problems occur most frequently in congested urban areas, but occasionally affect employers in other places. For example, a University of Washington survey of employers found that 29 percent cited parking as the main motivating factor in sponsoring vanpool programs. Some of these were suburban employers faced with expansion or the need for better use of facilities. Most of them were in a central city area where parking is usually scarce and expensive (43).

An evaluation of the FEA vanpool marketing program found that parking is a problem for only a fairly small percentage of employers. *But where parking is perceived to be a problem, it seems to be the prime indicator of potential vanpool interest. The 4-cities study indicates the same about carpooling.*

For example, only 10 to 15 percent of the employers surveyed in three of four market areas indicated parking was at or above capacity. (The fourth area reported 38 percent with parking problems.) However, three of the eight employers solidly committed to starting a vanpool program had severe parking problems (44). Where parking is limited, private sector employers cannot tolerate either solo parking bans or inadequate employee parking space for fear of losing valuable personnel and/or triggering union difficulties. Such employers are prime clients for the RSA.

Commuters are clearly sensitive to parking. Margolin and Misch report that between 47 percent and 73 percent of the Washington, D.C., solo drivers they surveyed in 1975 predicted they would switch to carpooling if it were the only way to get a guaranteed parking place at work. This is higher than the 38 percent who said they would carpool if their parking

cost was \$20/month or more (4). The hassle of coping with limited parking was then a stronger ridesharing incentive than higher cost parking, and the 4-cities study indicates that this was still true in 1980.

Parking cost is an important ridesharing incentive where cost reaches a high level. What is perceived as "high" is another matter. The percentage of employees who pay over \$1.00/day for parking is small. In 1978, Johnson and Sen estimated that less than 5 percent of commuters (includes those who have no parking expense) paid more than \$1.00/day (1978 dollars) and that they were confined to CBD areas (7). The parking savings alone of switching from solo driving to a carpool with two other persons are \$15/month or more, depending on how much over \$1.00/day the parking cost is. In San Francisco in 1979, monthly rates of \$3.00/day were common near the CBD. This gave parking savings of about \$22/month in a three-person carpool or \$66/month in a vanpool, enough to pay for the van fare. In itself, however, such savings did not and do not necessarily motivate the solo driver to rideshare. The 4-cities study found a total study average of \$10.50/month paid for parking, but this broke down into less than \$1/month for the suburban-employed to over \$19/month for the urban-employed. Yet it was the suburban-employed paying so little (most park free) who were more responsive to the idea of ridesharing if that guaranteed free worksite parking. (All were responsive, 66 percent of suburban vs. 61 percent of urban-employed.) That those paying little or nothing were more attracted to a guaranteed saving than those paying much, is probably because the latter had adjusted to their high parking costs gradually. Appendix D presents more detail and strategies on this issue not only by target groups but also by metropolitan area, so that RSAs can find suggestions from those communities most like their own.

2.4 HIGHWAY CONGESTION AND LIMITED TRANSIT SERVICE

■ Congestion and to a lesser extent limited transit service help motivate people to rideshare if parking problems are also troublesome. These combined effects are most often found only in CBD areas including those of "suburbs" which have become satellite cities. ■

Dislike of the inconvenience and delay of daily driving under congested traffic conditions was seldom the stated principal reason for ridesharing in the past. In Ref. (4), traffic congestion in 1975 was not mentioned at all among the primary reasons given for joining a carpool, although it was the single greatest commuting complaint: 95 percent of the mentions. However, the same study found wide support for reserved or preferential lanes for carpools and other high-occupancy vehicles. Many solo drivers would have been influenced to carpool by HOV lanes, which emerged as incentives that could have offset problems such as depending on others in a pool and having to leave work at a fixed time each day. The benefits of HOV lanes to carpools are to reduce delays due to congestion; it was therefore worth a good deal to ridesharers to avoid congestion. Additional evidence comes from the response of both solo drivers and carpools that carpools offered a more relaxed ride. Relaxation is likely to be associated with relief from driving hassle

and time pressure. As the findings from the 4-cities study presented in 1.6 show, today's solo drivers are even more hassled—and by more than traffic congestion—and they continue to endorse HOV lanes. In fact, by 1980, the prime motivators for ridesharing among present solo drivers were a combination of cost and hassle reduction. The intensity of irritation with traffic congestion had increased, as the Decision Analysis Panel discussion groups made obvious (even though the extent of congestion complaints shrank in the face of so many other commute harassments). That intensity appeared due to an interaction effect with the many other commuting annoyances.

Occasionally, localized congestion from employee autos restricts access to an employer's land so much that it becomes a primary motivator of an employer ridesharing program. The 3M Company and the Tennessee Valley Authority are examples in which extreme congestion on facility access roads was relieved by starting an employer vanpool program (7). Such acute congestion is more often found only in a CBD area or large suburban satellite CBD where it is beyond the efforts of any single employer to affect it through ridesharing. For further discussion and specific ridesharing strategies, the reader is again referred to Appendix D. The extreme traffic and parking congestion of Houston presented there typifies the situation in fast-growing areas when transportation planning has lagged behind explosive metropolitan expansion.

A review of ridesharing research reveals two related studies on the effect of the unavailability of transit service. One study suggests that limited transit service has some effect on motivating employers to mount successful programs in outlying areas, particularly when access or parking problems at the company site are involved. The other study notes this same effect in companies having limited parking and locations within a congested CBD.

The first study was Jacobson's University of Washington survey of employer vanpool programs (43). This survey found that insufficient transit service was most mentioned as a major motivation for employers to sponsor vanpool programs. It was mentioned by 43 percent of employers as a major motivation compared to parking problems that were mentioned by 29 percent of employers. Almost all of these employers were in the suburbs, small towns, or rural areas.

However, Jacobson also found that the employer ridesharing programs motivated by insufficient transit alone in such areas tended not to be as successful as those motivated by parking or highway access problems. The reason appeared to be that vanpool programs that were started to solve parking problems saved money for both employers and employees, whereas programs started to compensate for the lack of transit helped only the employees. Thus insufficient transit appears to be a rather weak factor for motivating employers to sustain ridesharing programs by themselves in outlying areas.

The second study concluded that insufficient transit can be an important factor in vanpool potential when the company has limited parking in a congested location. This view was advanced by the SRI evaluation of the FEA sponsored vanpool marketing program (44). *In essence, this is saying that only when automobile access is severely impaired by limited parking and the traffic congestion usually found in an urban or suburban CBD, and sometimes at single employment sites*

with limited access roads, does insufficient transit become an important ridesharing factor for employers. Then, limited transit service can motivate ridesharing by employers or others, for example, if the transit system is operating at capacity during peak periods or if it has inadequate routes or headways. This is the situation at the Golden Gate Bridge leading into San Francisco. Congestion on the bridge and the high cost of parking downtown have caused commuters to fill the Golden Gate buses to capacity. Adding more transit capacity is too expensive for the Bridge District. Consequently, the Bridge District has turned to ridesharing to offset an annual 2.5 percent growth in bridge commuters.

2.5 LONG COMMUTE DISTANCES

It is well established that commuters who travel only a few miles to work are not likely to carpool. This is because the benefits of expense reduction, hassle reduction, and social opportunities are small; and the costs are high in added travel time, inconvenience, loss of mastery over the commute, and possible social problems. As trip lengths increase, the balance among these factors begins to tip more in the favor of ridesharing. This explains why the average Los Angeles carpooler, for example, travels about 20 one-way miles to work whereas the average solo driver commutes only 10 miles.

Potential vanpoolers face a similar tradeoff, but without saving money on short commutes. Only for longer trips are the cost savings and other benefits great enough to offset the vanpool fare. This explains why most vanpools are used for trips of at least 15 miles, one way. Many are longer: the average one-way vanpool trip length in Seattle is 28 miles; in Los Angeles, 35 miles; and in the Golden Gate vanpool demonstration program, 40 miles.

What all this means is that carpooling and vanpooling are more likely to succeed in metropolitan areas where there are substantial percentages of "long" distance or time commute trips. That information is readily available from local transportation planning agencies and can be used to help estimate the chances of success for an areawide carpool/vanpool program. Section 4.2 describes the procedure for estimating ridesharing potential.

2.6 PROGRAM SETTINGS

- Traditional RSA emphasis on locating programs with large employers ignores the potential of activity centers and neighborhoods. Beyond a minimal size of perhaps 100 persons, the critical success elements are organizational motivation (activity centers and employers) where the employment end offers more and a comfortable social mix among potential poolers where the neighborhood program has the advantage. ■

2.6.1 Neighborhood Programs

There are organizations existing in many neighborhoods which could be of help to an RSA in mounting home-end programs. These include churches, civic associations, and homeowner or condominium associations. Some exurban new towns have used buspools effectively (e.g., Columbia, Maryland) by taking advantage of common employment in a few distant metropolitan centers. Currently, the New York State DOT is working with a neighborhood coordinator pilot. The difficulty with the home-end approach is partly perceived and partly objective. The suburbs are perceived by

many RSAs as dispersed and not organized in the sense that an activity center or an employer is. To some extent this is true. However, the trend in U.S. real estate is toward cluster housing—as much because of the sharp increase in single-head-of-household families as because of the greatly increased cost of housing. Cluster housing developments, like the single frame housing developments which preceded them in the 1960's and early 1970's, invariably have homeowner or condominium associations that can be approached. These vary in efficiency of leadership, but all have the advantage of tapping socially homogeneous commuters. The suburban locations and increasing reduction of households to single-auto ones with only one adult mean that auto maintenance and lack of backup transportation cause serious chronic problems. These could be relieved by both regular and emergency pooling. *Whether the RSA fills the role of neighborhood coordinator or provides training and backup for coordinators from the neighborhood, there is fine potential for home-end ridesharing approaches.*

2.6.2 Employer Programs

Concentrations of employees found at employment sites or in activity centers are important to the RSA for five major reasons.

1. Employers and activity centers have staff and other resources in place that can help facilitate the RSA's work.
2. Promotion through the workplace tends to increase commuter interest (as opposed to generalized, areawide appeals) because an entity is involved that is known and therefore more trusted than the RSA—unless the RSA already has both a widespread and favorable reputation.
3. If employers, or activity centers which represent many employers, collaborate with real interest, these powerful "gatekeepers" can have a strong positive influence on employee decision-making.
4. Ridesharing programs among larger employers and activity centers promise greater return of effort than in widely dispersed very small companies or low density areas—all else being equal.
5. Limited RSA resources can achieve more than if many small, scattered entities had to be contacted, informed, convinced, and organized.

The potential for increased carpooling at the employment end, of course, arises from the increase in ridesharing participants possible (7), as previously noted. This relates not only to number but to the probability of enough employees living close enough to each other to want to join in a carpool (for reasons of social comfort, as well as travel time). With vanpools, the added factor is that the probability of employees living close enough to be able to vanpool would tend to improve with increasing company size. For example, Shearing (11) estimated that a third-party ridesharing program in the Standford Industrial Park in Palo Alto, California, would have roughly four times the vanpool market of separate programs based within companies (the 21,000 employees in the industrial park are divided among 55 employers over an area of 655 acres).

A special reason for vanpooling success among large concentrations of employees is the spreading of start-up costs

and program administration costs. The program costs per van vary with the number of vans and usually lead to a reasonable estimated breakdown fare somewhere between 20 and 40 vans for a third-party operator without subsidy (46). In a company-sponsored vanpooling program, large companies can generally absorb or pass along the start-up and administrative costs more easily because of the lower level of such costs per van. Furthermore, the 4-cities study indicated more commuter confidence in employer than in neighborhood van pools, probably because of the stability perceived. Even carpool programs require staff, records, and telephone costs, although not the vehicle capitalization.

However, the importance of company or activity center size can be overemphasized. The key factors underlying the effect of size in ridesharing program success are the concentration of employees (1) at distances over 10 to 20 miles or commute times over half an hour; and (2) from similar cultural groups. Where there is considerable cultural diversity, the income and occupational distributions within an employment site or activity center will also be crucial, as the Appendix D findings from the 4-cities study reveal. *In metropolitan areas that are not culturally homogeneous, there is great reluctance on the part of commuters to vanpool or carpool with people from markedly different job/income levels because of the social and lifestyle differences.* A small company that employs mainly one type of personnel may therefore have more success initially than a larger one with personnel in highly diverse income/occupation categories. A survey of employee residences and their interest in ridesharing is the best way to determine if sufficient concentrations of compatible employees exist for carpooling and vanpooling.

Program experience suggests no relationship between company size and the percentage of its employees responding to ridesharing programs (7). For example, successful vanpool programs are found in companies of 100 to over 10,000 employees. Moreover, the University of Washington survey of employer vanpool programs found the median company size to be 950 employees in the most successful programs compared with 1,600 in the least successful programs (43). In short, although size can contribute to the prerequisite employee concentration, carpool and vanpool programs can be viable in small companies and activity centers as well as in large. This, of course, is because other conditions are important in ridesharing program success. For example, early efforts in the Minneapolis ridesharing demonstration project to promote multiemployer sites had little success. This was due, in part, in the opinion of the project evaluation team (47, p. 5-2) to the facts that:

... the multitude of working shifts, overtime requirements, rotating shifts, and business need for a car accumulatively served to limit ridesharing potential at the sites. Compounding these factors, short commute distances and excellent highway and parking access to the work place further reduce the values of ridesharing.

The evaluation team concluded that "the ridesharing potential of non-CBD multi-employer sites may be severely limited because of their inherent work and community conditions." This will not be true, of course, in suburban sites where all the conditions which bedeviled that demonstration are not present.

There are also crowded activity centers made up of many small or large employers where congested access and parking limits make ridesharing attractive to employer and employee alike. Often, congestion relief is needed to free access and parking for customers as well as employees. Some, like Silver Spring, Maryland, have become congested suburban satellite CBDs despite a layout originally suited to “village” pedestrian shopping. Silver Spring’s Share-A-Ride program is a direct response. Others are new activity centers located either in similarly congested areas or in such fast-growing ones that access becomes choked. See 4-cities study findings in Appendix D concerning Houston where activity center ridesharing is gaining rapidly for this reason despite the Texas tradition of the independent solo driver.

2.7 REGULAR WORKING HOURS

- Regular or flex-time working hours are important additional factors for success. ■

Regular working hours at an employment site aid ridesharing by increasing the concentration of commuters available for forming pools that arrive and leave at the same time. In multi-employer or very large employer programs, differences in starting times or the travel time between drop-off points can impose a time penalty on ridesharers. However, flex-time working hours can be of help to allow ridesharers to adjust their working hours to suit the pool schedule, providing these are stabilized, rather than changeable, particularly when pool members come from more than one employer (7). Support for this view comes from an FEA vanpool marketing experiment which concluded that flex-time working hours constitute an important positive indicator of vanpool potential when considered with other factors (44). See Section 7.3 for more details on the effects of flex-time hours.

The most significant working schedule barriers to ridesharing are staggered but fixed working hours, employee changes between shifts, and large amounts of (unpredictable) overtime. These work schedule variations, of course, reduce the concentration of commuters available for pooling. Many employers have cited the effect of variable working hours as a reason for not starting a company vanpool program (43, 44).

Nevertheless, the presence of work shifts does not preclude a company ridesharing program. For example, Erving Paper Mills in Brattleboro, VT, operates three shifts per day and uses the same set of vans for each shift by filling them with outgoing employees as soon as they bring in the next shift. An allowance is made for residence location in making shift assignments. The van driver is responsible for leaving the van at the home of the next shift’s driver. The motivating factor for the company vanpool program is a longer than average commute: the company moved 25 miles from its former site in 1972 and started the vanpool program to retain skilled employees (7).

Unstable employment conditions, such as a high rate of employee turnover and frequent layoffs, also interfere with carpool and vanpool formation and continuation. However, all such factors related to working conditions need to be considered along with the important ridesharing motivators of highway congestion, commute distance, and parking access limitations in judging the ridesharing potential of a company or employment center.

2.8 THE SOCIAL CLIMATE FOR RIDESHARING

- Local social approval of ridesharing is important because most people seek that for their travel, like their other, behavior. A tradition of social collaboration is even more important. Both interact with geographic and traffic conditions. Both also vary with local customs and with in-migration patterns. How to assess the local social climate for ridesharing and build promotion strategies on more and less favorable ones is clarified in terms of examples from the 4-cities study. ■

This community condition for success is likely to differ from community to community and within large metropolitan areas. Little ridesharing research has addressed the issue outside of the 4-cities study (3). It has long been clear from program experience, however, that it is a far more difficult matter to gain acceptance for ridesharing where there is no positive community experience with it and no consensus or social pressure for it.

As with any other change in human behavior, particularly those which affect cherished habits of control over mobility, social opinion is an important influence. In the 1980’s, it is much less fashionable to waste energy in certain conspicuous ways: in some neighborhoods even people who pay no attention to their electric bill tend to turn off at least extra outside lights in order to avoid criticism from others on their streets. Also, a considerable body of research does show that new adopters of solar energy systems, thermal energy storage (cheap off-peak electricity for space and water heating), or ridesharing typically “talk up” the innovations they have adopted, as did the first purchasers of European small cars after World War II. There are excellent psychological reasons. Not only does a desire for “cognitive consistency” lead people to rate the change they have made as a good one, the need for social confirmation of their decision also tends to drive them to recruit others. Except for the relatively small proportion of the population which enjoys being different, the first on the block to adopt something new, most people quite unconsciously seek social approval of their lifestyles from other people who are part of their crowd or their group.

The four metropolitan areas investigated in preparing this manual were chosen for their sociological, as well as transportation and geographic, differences: Albany (N.Y.), Houston, Minneapolis, and San Francisco. It is no surprise that the data reveal four quite different social climates for ridesharing. A quick overview follows of two (Albany and Houston) vastly different social climates for ridesharing. The most important factors determining these social climates are summarized to illustrate an analysis process that can be used in their own communities by policy planners and RSA staff. More detail can be found in Appendix D.

Albany. The Albany metropolitan area has a population small in size and highly dispersed and excellent road and parking facilities that continue to develop comfortably in advance of traffic needs. There has been relatively little public transportation or ridesharing. The population is a rather homogeneous and socially comfortable one with traditions of initial social reserve. People there are remarkable for their “don’t fence me in” enjoyment of uncrowded residence and suburban shopping areas widely separated by stretches of pleasant countryside. The northeastern location assures sharp concern with all fuel costs. Albany’s history of immigration is a gradual one that mainly tapped people from

nearby areas and ethnic groups similar to those already there. That fact, combined with an age distribution now typical of much of the U.S. (increasing older and decreasing younger groups), helps assure satisfaction with traditional ways unless there are good reasons indeed for change. As a result, the social climate for ridesharing is difficult. Why should people give up the independent and "unhassled" mobility that makes possible the very "country metropolis" lifestyle they sought out in the first place? The main reason is cost, but this has to be handled most carefully. Because of the sense of being manipulated into higher fuel costs of all kinds by "government or industry" (an anger greater in Albany than at any of the other sites studied), cost appeals will have to tap these very independent solo commuters' desires to control their own commutes and budgets, while avoiding issues of blame. The social climate advantage here is the lack of cultural diversity. Given just an initial chance to size up who will be in a vanpool or carpool, people in Albany then easily break through to sociable collaboration with others.

Houston. Houston is a large, densely populated metropolis whose growth can only be described as explosive. The lack of past urban and traffic planning left a legacy of untrammelled growth where tenants are even moving out of some as yet uncompleted activity centers because of choked access and parking. Public transportation lags. The cultural diversity and social class mix are remarkable. The population tends to be young, interested in innovations, ready for them, but acutely uncomfortable with people from the different economic, ethnic, and other social groups because these groups have not had time to work out comfortable ways to relate to each other. This is a sunbelt city with in-migrants from all over the United States as well as parts of Latin America. The result is an ambivalent social climate for ridesharing. Many employers and commuters want it to free roads and parking lots, and to reduce the extreme "hassle" that solo commuting means. On the other hand, commuters there are more wary than any others found in the study about who else might be in a pool. Here approaches of choice will be (1) the less personal vanpooling, already popular; and (2) dedicated van and carpools (for executives, for labor crews, for sales forces, and the line). Very close attention indeed to familiarization techniques for commuters and personalizing the match process will be critical for carpools, and not unimportant for vanpools.

In summary, the more important factors determining the social climate for ridesharing are:

- Size of metropolis.
- Size and quality of suburban centers (not discussed in the quick sketches above).
- Density.
- Traffic conditions including roads, parking, HOV lanes, existing public transportation.
- Weather conditions as they affect driving.
- Cultural homogeneity or diversity.
- Cultural flavor (prevailing ethos, interest in change, age and occupation distributions, existing social and economic groupings).
- In-migration pace and patterns.
- Household composition.
- Experience with ridesharing programs.

2.9 FAVORABLE REGULATORY AND POLITICAL SETTINGS

- Federal regulations favor ridesharing. The nature of state regulation is very important for vanpool success because some states effectively prohibit vanpools, especially third-party programs. ■

Federal regulations generally encourage ridesharing. For example, federal ridesharing legislation exempts commuting vehicles of 15 passengers or less from Interstate Commerce Commission regulation as long as no more than one round trip is made daily (8). In addition, federal regulations provide the following incentives to ridesharing (48):

- Full 10 percent investment tax credit for employer-provided vans or buses used for commuting.
- Exclusion of the value of employer-provided transportation from commuters' income.
- A permanent ridesharing demonstration program with 75 percent funding from federal highway trust funds, limited to situations with no adverse effect on transit.

State regulations vary greatly in their effect on ridesharing. Carpools are not regulated at all, probably because they are not perceived as a serious threat by public carriers (7), and possibly because the cost of regulation would be high and the political implications poor. Vanpool regulation varies from state to state, ranging from no regulation to severe regulation on the basis of vehicle size or the number of passengers. Others require for exemption that they be nonprofit or employer-sponsored as well.

Some states classify vanpools, especially third-party vanpool, as common carriers and therefore subject to considerable regulation. In case of a complaining transit operation, entry can be effectively barred. In Atlanta, a nonprofit third-party vanpool service called MODNAR was classed as a common carrier by the public utility commission. The local transit operator has contested its operation, accusing it of competition and "skimming off the cream." Vanpool operation is very difficult under these conditions because the burden of proof in such a contest is on the entering vanpool operator and because routes, schedules, and rates tend to be closely regulated. Buspool or club bus operators are regulated by public utility commissions in most states because they are usually profit making services under contract to a private group, an employer, or a public agency. There is yet no evidence on the effects of this regulation on buspool formation effectiveness and survival.

In a recent study for FHWA (49), the National Committee on Uniform Traffic Laws and Ordinances reviewed legal impediments to ridesharing in all 50 states in the form of motor carrier laws, insurance for ridesharing arrangements, state vehicle codes, state fair labor standards acts, state income tax laws, and restrictions on the use of government-owned vehicles. A model state law was developed by the Committee that corrects such impediments; see Section 7.3 for a summary of the contents of the model law.

The presence of strong political support for ridesharing is an obvious asset in gaining favorable publicity and attention for a new or expanded ridesharing program. The mayor or city manager, council members, county supervisors, and

state highway department or DOT or energy department directors are all people whose endorsement can have tangible and, sometimes, economic value. The prospect of such support can probably be determined by a few phone calls or visits. Section 4.5 describes the solicitation of political and other forms of external support further.

Where there may be political opposition to an existing or projected ridesharing program, the increasing availability of research findings may help concerning consumer interest in, needs for, and benefits from ridesharing; and the assistance car, bus, and vanpools can provide in relieving peak load congestion and increased expense.

CHAPTER THREE

KEY DESIGN CONSIDERATIONS

This chapter describes several considerations that should be kept in mind or adopted as policies while planning, implementing, and operating a local ridesharing program. They include a client-centered approach, personalizing ridesharing, the flexibility of formative (or program-shaping) evaluation, the option of brokering many alternatives to solo driving, effective promotion, and hiring capable administrators.

3.1 CENTERING THE SERVICE ON THE CLIENTS

■ Ridesharing in any form is a collaboration among transportation consumers. Because it requires their input, it must meet their most important preferences and needs to induce and maintain the major change in mobility behavior and management of time associated with ridesharing. Such behavior changes can be accomplished only through active outreach efforts for all but those most ready to rideshare. ■

Ridesharing is a special kind of transportation service: it involves some form of specific commitment and cooperation among small groups of consumers beyond simply using the service, as one does with mass transit or taxis. Even for a buspool, one has to subscribe. Vanpools require more collaboration, and carpools are the most intense in terms of sharing the driving, need to reach agreements, etc. In trying to mount a successful program, however, it is not necessarily obvious how to balance the economic constraints of the program with satisfying specific consumer requirements.

Historically, the greatest attention has been paid to appropriate matching of origins, destinations, and working hours, on the assumption that these were the client demands that mattered. Clearly, good matches are necessary. What was not appreciated at first is that they are not sufficient. The most social and other skills required of the individual traveler to rideshare successfully, the more important are factors beyond a good match of origins, destinations, and work hours. The skills needed are greatest in carpooling, present but less in vanpooling, and least in buspooling.

It is understandable, however, that the point was not appreciated, because it appears to be one not readily volunteered by ridesharers themselves. Many surveys have found that people say they rideshared in the past because there was

a good match available and that they stopped ridesharing because origin/destination/work hours changed. In-depth assessments of carpooling indicate that this is misleading. In a study by Margolin and Misch (4) which included intensive analysis of the decision process in small groups, as well as a survey, it was found that (1) people indeed do mention schedule and location difficulties as a reason for terminating a carpool; (2) on further discussion, the importance of such social strain factors as chronic lateness, smoking, messing up the car, etc. emerge as powerful decision factors; (3) among those who had stopped carpooling in the past, current carpools are more comfortable admitting personal strain reasons than current solo drivers; and (4) even on survey, a full quarter of those who had ever stopped carpooling in the past did give personal strain reasons, but did not always overtly label them as such. *The authors concluded that social interactions tend to be the most neglected of success factors in carpooling.* They are often not foreseen as important by people before they begin to carpool. They can be difficult to handle during carpooling. They tend to be ignored as relevant after carpools disband, particularly by those who turn to solo driving. There is evidently a bias against stating "emotional" or "not being able to get along with others" reasons as the cause of changes in commuting behavior. Personal strain factors operate powerfully, nonetheless.

There are more universal reasons for this. Mobility via the individual car is a firmly entrenched value in this society. If this behavior is to be changed, clients will insist on a good reason for doing so, on good service (because they have had good service in the past when driving alone) and on knowing what they are getting into. In the past, after all, they had complete control of their intrinsic commuting conditions. Merely publicizing that matches are available will not attract. An active outreach approach will be required.

Although there has been a strong tradition of active outreach in the private sector, the public sector has not traditionally operated in this way. The role, being unfamiliar, may seem inappropriate. This issue was addressed in Section 1.5, and specific outreach techniques are detailed in 4.6. A great deal of this outreach amounts to personalizing the ridesharing program by familiarization methods: seeking the advice

and help of commuters or other types of travelers; getting them together to become informed about, to discuss and to help shape their carpool or vanpool program. Personalizing the program has been found so important that a separate section is devoted to it later in this chapter. Outreach also includes the important point of doing something with the failures, helping to reorganize disintegrating vanpools and carpools, and first trying to rescue those getting into difficulty.

The RSA almost always operates in a buyer's market. The majority of commuters still have the option of solo driving which is well reinforced by habit, by status considerations, and by a large cluster of convenience, personal mastery, and independence factors. These are becoming modified by rising fuel prices and inflation for some, and by the annoyance of auto maintenance and rush hour driving for many. Meanwhile, the only way to sell ridesharing under buyer's market conditions is to maintain sensitivity to client needs and important preferences. That means becoming keenly attuned to the disadvantages of solo driving for particular target groups and to take advantage of the unique benefits that the various ridesharing modes can offer specific kinds of travelers in specific locales. In practice, this means tailoring approaches to target groups rather than to individuals: for instance, to skilled blue collar workers with suburb-to-suburb commutes. Individual needs and crucial preferences are served by offering options according to major group preferences. These, in turn, depend on the characteristics of a local potential ridesharing population: no-smoking carpools, executive vans, winter-only ridesharing, etc. Appendix D, where many findings from the 4-cities study are summarized, offers insights into important target groups, site-specific differences, and strategies for tailoring ridesharing to both.

Certainly the RSA which restricts itself to the passive approach of offering match lists alone, instead of actively reaching out to probe and satisfy crucial client requirements will tend to find itself successful with first acceptors only. First acceptors are those "ready souls" whose motivation to rideshare is firm before they are ever approached. Many of the population of first acceptors in any community have put themselves into carpools—and some into vanpools—without the help of any program. Others respond very quickly when the sheer opportunity is offered. Because their motivation is predetermined, they in effect "train" the staff of a new RSA in minimal methods: some initial success is achieved through little more than publicizing the service and making matches. This builds in a difficulty for the unwary RSA. The next waves of potential acceptors will require much more. If the earlier passive approaches are repeated, they will result in much failure, considerable staff frustration, and often staff anger against the "unresponsive" clients. An RSA must expect the first acceptor phenomenon, use it as a welcome success wave in the first stages of operation, and train staff to be ready for different approaches to the less easily satisfied clients who require the bulk of RSA work over time. However, if active outreach methods are used from the beginning, there is not only less staff readjustment, but a great deal more success can be achieved earlier. Furthermore, the RSA avoids losing the interest of later acceptors that will otherwise occur once the RSA image is set as an impersonal matching operation. It is much more difficult to

convince people that something better than the first service is available than it is to set off on the right foot in the first place. So powerful are original images (as the advertising world well knows) that an existing RSA switching from sheer matching information work to active outreach would do well to change its name too.

3.2 PERSONALIZING RIDESHARING

■ For success with all but the readiest first acceptors, RSAs should personalize the approach to consumers, the matching process, and follow up to maintain or to rematch pools in trouble. Although the cost ranges of personalized ridesharing are not yet clear, their effectiveness potential is. It contrasts sharply with initial failure and later high dropout rates of impersonal programs. ■

Ridesharing in any form is a social matter and the research data make clear that people insist that social matters be handled in a personalized way. Personalizing ridesharing means three things for the RSA:

1. Personalizing the approach to the consumer by having human beings (coordinators) be the contact point for information matching rather than relying on lobby locator lists or on computer printouts sent directly to potential poolers.
2. Personalizing the matching process itself by familiarization methods so that potential ridesharers can find out enough about others who also might be in their pool to be willing to commit themselves to at least a trial of ridesharing.
3. Personalizing the pooling process by follow up to help maintain pools, rescue those getting into difficulty, or rematch people into other pools when that becomes necessary (i.e., when pools are dissolving from social strain, members moving away, vehicle difficulties, or changes in origins/destinations/travel time).

RSAs have found low rates of carpool and vanpool formation from simple circulation of match lists to applicants; about 10 percent to 20 percent of those requesting them. (Even these requestors represent only a restricted range of the potential pooling population because many who would respond to a coordinator will not request a match list.) They have also found high rates of attrition among the pools that do form. Currently, there is more RSA experience with personalized approaches and familiarization than follow-up. Like the formative evaluation with which it is so closely associated, follow-up has been seriously underdeveloped in ridesharing—although thoroughly familiar for years in other practical community programs that depend on client responsiveness. The well-known U.S. Agricultural Extension Service is probably the most experienced example. There, the coordinator is called an extension agent, but the process is the same. A locally known and trusted farm agent (*coordinator*), expedites the flow of information about new methods and products by dealing directly with local large and small farmers (*personalized approach*); helps with the adaptation of the innovations in ways suited to the particular farmers (*personalized matching*); keeps track of difficulties and helps solve many on the spot (*follow up*); and feeds back success and failure data to the program, as well as the causes for both, and in the process serves as a prime agent in reforming program goals and approaches in the light of the experience (*formative, or cybernetic evaluation*).

RSA's are increasingly using personalized techniques: examples include MTC Commuter Services in Minneapolis, RIDES in San Francisco, Share-A-Ride in Silver Spring, and the Car-O-Line Neighborhood Ridesharing Demonstration Project of the New York State DOT in Albany. Exhibit B shows the personalized Albany approach.

The entire personalization process is detailed in Chapters Four and Six on program planning and implementation. The following briefly outlines the known need for each step.

3.2.1 The Need To Personalize the Approach

In their study of carpooling attitudes among carpoolers and solo drivers in 1975, Margolin and Misch (4) found that both types of commuters (1) strongly preferred carpool match methods involving a worksite or neighborhood coordinator, (2) were quite responsive to being called by another commuter forming a carpool, but (3) endorsed at less than chance level the use of the impersonal locator list or computerized matching (when used without the intervention of a coordinator). This situation appeared the same when the 4-cities study of solo drivers was carried out in 1980. Carpool worksite and neighborhood coordinators were endorsed at the 78 percent and 74 percent level, respectively, and 63 percent liked the idea of being called by another commuter forming a pool. However, only 40 percent would consider using a lobby locator list, only 33 percent a computer printout, and only 25 percent handling the matter on their own. Only 10 percent would consider starting a vanpool by themselves, while 59 percent were interested in neighborhood-based vans and 79 percent in those organized at the worksite. (A known coordinator was intrinsic to the vanpool items, except the one on "organizing one by yourself.") Note also that a full 59 percent perceived carpools, and 60 percent vanpools, as difficult to arrange.

3.2.2 The Need To Personalize the Match

The same consistency over time occurs here. In 1975, over 85 percent of both solo drivers and carpoolers insisted they would want to meet the others who might be in the same carpool at least once before making definite arrangements. Among solo drivers, 35 percent insisted they would carpool only with people they already knew, and the carpoolers were even more insistent: 43 percent (4). In the 1980 4-cities study of solo drivers, 71 percent would want to meet the others at least once before carpooling, and 58 percent before vanpooling. The insistence with pooling only with people they already knew was expressed by 28 percent for a carpool and 20 percent for a vanpool.

In addition to social compatibility, an important reason that people need to know something about others before getting involved in a pool is because ridesharing is a combined social/business activity. People tend to be inexperienced at handling relationships that are mixed in that way and uncertain of the "ground rules." Therefore, an essential part of personalizing the match is helping poolers know the ground rules for the expected behavior. This will be more important in the highly personal carpool, but still important in the vanpool. "How to Pool" booklets can be invaluable as a combined introduction to the pool and to take the onus off the members of having to tell others what is acceptable behavior. Prospective members need to know that the group

must come to agreement on such important matters as pickup points and times, driver rotation, payment for riding or parking, any wait for late members, whether smoking, eating, or drinking ordinary or alcoholic beverages, radio playing, etc. will be allowed and, if so, within what limits. Questions about advance notification of not riding, handling trash in the vehicle, and the critical matter of making it legitimate to bring up difficulties for discussion are particularly important. Such flyers or booklets were highly endorsed in the 1975 Margolin and Misch study of carpooling (4), as well as in the Decision Analysis Panel series run in the 4-cities study. Additional information on carpooling agreements comes from a 1977 study of relationship maintenance in carpools and vanpools around Knoxville by Owens (50). Owens found that one of the very few discriminating features of successful poolers was that they tended to have a relatively large set of agreements with other members about details of the pool's operation. In all three studies it was found that few would refer to these as rules, preferring to call them "understandings." Exhibit C shows a brochure for carpoolers developed and used by the Denver COG ridesharing program. Point 11 stresses the need for reaching agreement on all matters of mutual interest, and the other points except 14 suggest specific rules or agreements.

3.2.3 Need for Follow-Up

Surveys of persons who have left a carpool find that most people offer explanations suggesting causes beyond the control of the commuter. They attribute leaving the pool to a change of home or work location or time schedule (4, p. 28; and 51, pp. 40-41). However, in-depth assessments of former carpoolers reveal that this is misleading. As pointed out in Section 3.1, social interactions often make or break carpools, but seem not to be considered appropriate reasons to offer. Although knowing pool members in advance and assisting people in setting up comfortable carpool agreements will help prevent such problems, maintenance operations will still be needed. That way, disheartened carpoolers can be helped to solve their problems or to shift to another pool rather than revert to solo driving. In addition to research data, there is some program experience with personalized follow-up.

Carshare in Houston maintains a personalized emergency service in addition to its basic program. The pooler whose car breaks down or who finds himself stranded for any other reason can telephone and be given the name of another driver to contact immediately. Demand has been heavy. In fact, during the gas crisis of 1979 so many calls came in from nonpoolers trying to rideshare that all could not be handled. The experience points up the need for areawide follow-up service. It also indicates the need to be able to expand that service quickly in times of crisis, and suggests the potential of an Emergency Ridesharing System to be triggered when crisis conditions arise from fuel shortages, storms, and so on.

Less is known about why vanpoolers leave because the mode is so much newer, but available program experience suggests opportunities for RSA intervention. For a 1979 Commuter Computer evaluation survey (52), about 39 percent said that the fare was too expensive; 21 percent were unhappy with the van route, schedule, or pickup points; the remaining 40 percent cited a change of employment, work location, or working hours. (These reasons may be biased

What will CARPOOLING do for you?

1. **Save Money**
 - Use less gasoline
 - Split the cost of parking
 - Some insurance companies reduce premiums for regular carpoolers
 - Less frequent repairs
 - You may not even need a second car
2. You can **relax** - you won't have to fight traffic every day.
3. It's **safer** - your carpool members will help in emergencies such as snowfalls or flat tires.
4. It's **fun** to talk with friends on the trip to work.
5. If everybody carpooled there would be less traffic congestion, less air pollution, and less energy use.

MONEY SAVING CHART

Home to Work Distance	Car Size	Yearly Cost to Drive Alone	YEARLY SAVINGS		
			In a 2 Person Carpool	In a 3 Person Carpool	In a 4 Person Carpool
10 Miles Round Trip	Small Car	\$ 500	\$224	\$286	\$348
	Big Car	\$ 750	\$337	\$431	\$521
15 Miles Round Trip	Small Car	\$ 679	\$294	\$380	\$465
	Big Car	\$1026	\$447	\$577	\$706
20 Miles Round Trip	Small Car	\$ 858	\$364	\$473	\$582
	Big Car	\$1301	\$657	\$723	\$888

What will the CARPOOL COORDINATOR do for you?

1. **INVITE** you to a short meeting where you can meet others from your town who want to carpool.
2. **INTRODUCE** you to other carpoolers if you need more members.
3. **LISTEN** to your carpooling problems and help you try to solve them.
4. **HELP** you find another carpool if the one you are in doesn't work out.

CARPOOLING... TRY IT!!

Your Carpool Coordinator will contact you in a couple of weeks

Tear Off and Return to Your Superior

CARPOOL COORDINATOR CARD

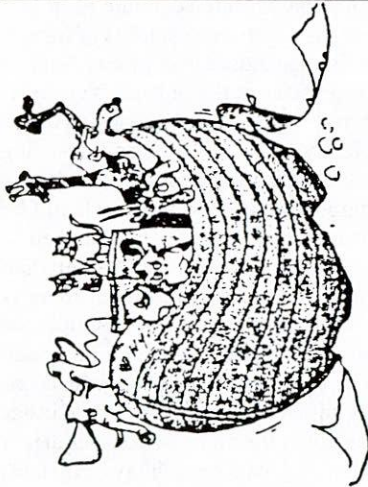
Work Phone _____

NAME _____

STREET _____

CITY OR TOWN _____

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED EXCEPT WHERE SHOWN OTHERWISE



Perhaps it was **AWFUL** and you dropped out because you couldn't stand...

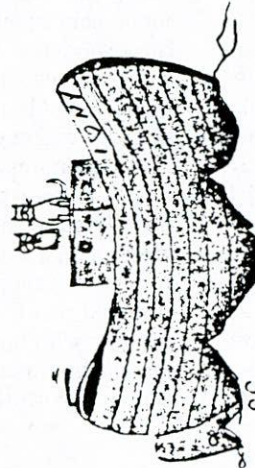
- the people
- or the smokers
- or the talk
- or the wait for someone who was always late

But suppose there was a **CARPOOL COORDINATOR** in your office who would

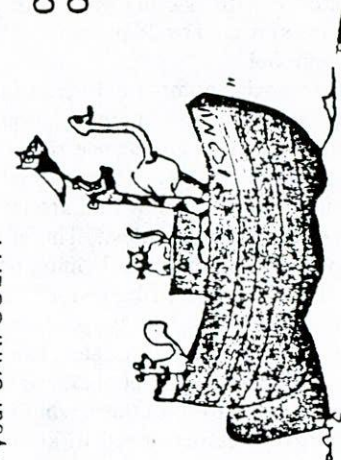
- **HELP YOU MEET** other people from your town who are also thinking about carpooling.
- **Help you WORK OUT DETAILS** so that you can arrange your carpool.
- **LISTEN** to your carpooling problems and help you solve them.
- **Or FIND ANOTHER CARPOOL** for you.

OVER FOR DETAILS

REMEMBER THE LAST TIME YOU TRIED TO CARPOOL?



Perhaps you **LIKED THE IDEA** and would like someone to hunt up some more people for your **CARPOOL**...



NEW YORK STATE ENERGY OFFICE



Here are some sensible tips for Double Up! carpoolers

1 Make it an *ironclad rule* that your pool serves but one purpose: commuting to and from work. You're in big trouble if it becomes a shopping or an errand service.

2 See if you can arrange to have only one driver - permanently. He or she will not only feel a definite responsibility to be the driver, but chances for misunderstandings will be greatly reduced.

3 On the other hand, if driving chores simply must be shared, reduce confusion and detailed scheduling by rotating drivers monthly or weekly - rather than daily.

4 Have a definite agreement in advance on reimbursement for driving expenses. (Example: Multiply roundtrip mileage by 12¢ per mile, add daily parking costs, divide by total number of carpoolers to determine share of each.)

5 Agree on regular payment basis. This is most important.

6 It is extremely important that a chain of communications be established among carpool members so that rapid adjustments can be made with minimum delay and inconvenience. The chain of communication should parallel the morning pick-up sequence: driver, passenger #1, passenger #2, passenger #3. Thus, if, for example, the driver is ill or the car won't start, the driver calls passenger #1 and asks him or her to drive. Also, if a passenger must change plans, he or she should notify the person who is picked up immediately before him.

7 Maintain a regular route and a regular schedule. Try to stick to it.

8 Resolve to be extra careful about maintaining harmony among passengers. For example:

- a) Don't honk for your passengers. It frays neighbors' nerves, often starts dogs barking for blocks around.
- b) Since most passengers will be watching for your car from inside their homes, it is most important that the driver is prompt.
- c) Have a prior understanding among all passengers on just how long the driver should wait for a passenger (should be no more than two minutes at the most).

9 Discuss carpool plans with your insurance agent (in most cases present liability coverage is adequate - but you *must* be sure!). See to it that all your riders are informed about insurance coverage.

10 It's important that the car be maintained in good driving condition - well serviced, safe, and comfortable.

11 Discuss any problems that might arise when your carpool arrangements are first made. Try to anticipate problems so they can be resolved beforehand. Reach *firm agreements* on all points, and renew them *regularly* to avoid misunderstandings. It's the little things that mean a lot. So don't overlook such small points as smoking, radio station choice and volume, earlier starting time on inclement days, etc. It wouldn't hurt to provide each passenger with a concise list of carpool rules.

12 Establish a pickup and delivery route that is convenient to the driver's home.

13 Try to establish a common meeting place and time for the trip home.

14 Carpooling isn't difficult. It can be most pleasant and enjoyable - as long as members set out seriously to make it work.

towards fare complaints, inasmuch as Commuter Computer's rates were on the high side in 1979.) Fares can sometimes be affected by the ridesharing agency through help with insurance or loan arrangements. Assuming that the 21 percent who were dissatisfied with the van route, schedule, or pickup points is representative, an RSA can assist in improving vanpool routes and schedules. Reassignment or new vanpool formation is possible for those who change worksites or hours of work. Furthermore, there are very likely other more social problems that people will not state on surveys. These could be discovered early and fielded by a coordinator working in an in-person follow-up mode.

A less close type of follow-up and maintenance is practiced by the Lawrence Livermore Laboratory ridesharing program which keeps in periodic touch with its carpools and vanpools to learn about and replace lost members. A periodic newsletter keeps pool drivers apprised of ridesharing developments and problems.

The Minneapolis, Sacramento, and Knoxville RSAs all use some form of telephone follow-up beyond distribution of a printed list. Although their procedures are not identical, they are similar.

Match lists are prepared by hand in Minneapolis. Several weeks after distribution of a group of match lists (usually for a single employment site), one MTC staff person calls each person who received a list. Inquiries are made about whether the recipient formed or joined a carpool, and if there were any problems. Encouragement to join a pool is given, and the MTC staffer may also mention other applicants who have been called, saying that they are actively seeking pool members and would welcome a telephone call. Conference calls were tried but abandoned as too time consuming.

The Sacramento Ridesharing Office reports placement of 34 percent of applicants from employer promotions, and 33 percent of dial-ins, in either pooling or transit. These are high percentages, and the office attributes part of its success to the practice of follow-up telephone calls to all likely prospects, at a cost of about \$7 per applicant called.

The telephone promotion system used by Knoxville Commuter Pool has been an important part of efforts, beginning in 1978, to increase placement rates from the 3 percent achieved simply by distributing match lists. Other changes were to present available matches or schedules for all ridesharing modes, including transit; and to provide step-by-step guidelines similar to Exhibit C for beginning a pool, such as starting on a trial basis.

Such steps had increased matching to 14 percent by the time telephone follow-up began. The telephone follow-ups are selective, directed to parties who have some prospects of matching and relatively long commutes. The matching or placement rate has increased to 22 percent after a year of telephone follow-up. Initial salary costs were about \$20 per person placed and later dropped to \$6.

There are thus strong presumptions that (1) telephone follow-up helps create more matches and (2) they are probably quite cost effective if the conversations can be kept short. Several careful evaluation studies will be conducted by 1982 as part of the National Ridesharing Demonstration Program.

3.3 PROGRAM EVALUATION FOR PROGRAM IMPROVEMENT

A ridesharing program cannot be launched and left alone to

seek its original targets based on a predictably successful plan. There will be trials and errors, learning from both mistakes and successes; and there will be the need to let ongoing results feed back into program approaches so that efforts can be maintained on target: more ridesharing by solo drivers. Formative evaluation is a program approach which allows for continuous feedback to change policy and program, as necessary, in response not only to program difficulties but to changing economic, transportation, and social conditions. Applied to ridesharing, such an evaluation approach requires feedback from cooperating organizations (employers, activity centers, neighborhood agencies), from potential and actual ridesharers, and from coordinators to maintain constructive program improvements. What is especially needed is identification of any differences between the RSA's view of its own program, and how the results are judged by the clients. These needs can be met through the personalized approaches and matching systems discussed earlier, survey techniques, including small group discussion methods (see Section 4.2 in the context of planning the RSA), telephone spot checks, and in-person follow-up techniques.

In addition to the foregoing, contingency plans need to be developed for possible changes in procedures or staffing during emergencies. Will the RSA be ready for the sudden increase in ridesharing interest that accompanies the next fuel shortage or weather crisis, or will business go on as usual until backlogs and processing time delays force decisions to curtail or streamline service or add staff? Will the RSA remain alert to the more gradual motivational changes which affect solo drivers over time, and be ready to alter program strategies in line with these? For example, a comparison of the 1975 Margolin and Misch data (4) with the 4-cities study in 1980 revealed that the earlier, well-known desire of solo drivers for independence of others during the commute, as well as their general indifference to commute costs, had eroded in the face of sharply escalating commute "hassles" and living costs. This in no way lessened the demand for personalized ridesharing services. In fact, it increased solo driver insistence on retaining mastery over the kind and quality of their commutes should they rideshare.

The only safe form of planning is for alternative futures, building in program flexibility from the start. This means a monitoring and evaluation system that lets you know when and where both difficulties and changes are taking place. That is evaluation at its best: an ongoing, formative process that allows the RSA staff to maintain and increase effectiveness, free from having to adhere rigidly to original formulas.

Under such a system, negative feedback is no longer to be taken as criticism of staff that can leave them disheartened or defensive. Like the positive feedback that may also come, it comprises the very data any staff and management need and seek in order to work effectively.

3.4 THE OPTION OF A BROKERAGE APPROACH

- The business of RSAs can be construed as the brokerage of alternatives to solo driving, for both commuting and non-commuting purposes. This extension of services can be extremely valuable although more costly in terms of RSA time, staff, and other resources. Whatever the RSA span of activities, values are exchanged with several publics. ■

As noted in Section 1.3, local ridesharing agencies often offer a diverse range of services to transportation users.

These can include facilitating carpools, vanpools and buspools, providing transit information and possibly offering such services as park-and-pool lots and "fleet ride," the use of company vehicles for employee ridesharing at cost. Although the emphasis has been on commuters, RSAs can, and some do, offer their services for short and long distance leisure travel, shopping and special services for the handicapped, the elderly, and the "transportation poor" (those not served by public transportation who also do not have automobiles).

If a wide range of modes (and perhaps types of services beyond commuting) is to be offered, the RSA charter becomes that of facilitating travel alternatives to solo driving. When that happens, the RSA assumes the role of a client-centered broker who seeks and arranges the best option for clients among the choices available, including any public transportation. Clients may be individuals or groups of transportation users, employers, or activity centers. The brokerage approach works well in the stock market, the insurance business and tour and travel planning. It has been pioneered in applications to transportation by the University of Tennessee Transportation Center (e.g. 53, 54, and 55). The totally opposite pole to the full brokerage RSA is separate promotion of one mode—carpooling or vanpooling, and so on. Although this demands the least of RSA resources, one serious problem is that it tends to make the mode chosen by the RSA an end in itself rather than a means to reduce travel stresses and public and private travel costs. Furthermore, single mode RSAs run the danger of setting up competitive relationships with the local public transportation in the eyes of everyone—the public transportation staffs, the public, and the RSA staff. Maintaining good collaborative contacts with public transportation personnel and conjoint policy decisions (e.g., the use of ridesharing to help relieve peak load congestion without further public transportation costs) can take care of the problem. It will certainly require such attention.

In between the two poles, of course, come the options of offering some selection of modes, often beginning with one type of ridesharing plus public transportation information. This is a course many RSAs follow in the process of expansion.

It is useful in this connection to note that ridesharing activities involve an *exchange of values* between the various parties. Figure 3 shows the four principal publics associated with an RSA and illustrates the relevant value exchanges. The members of these four publics are extremely diverse, but they can be grouped in this way because each shares common types of value exchanges with the RSA in its role of serving the public at large.

RSA staff members should be particularly aware of, and sensitive to, the values that are exchanged with each group shown in Figure 3 because they can act as agents in arranging or promoting each set of exchanges. For example, products or services provided to ridesharing applicants can include information on commuting alternatives and their costs; match lists; familiarization assistance for new pools; and vanpool or buspool service and pool maintenance assistance. From the applicants who are helped to pool or ride transit, the RSA gains are the increased ridesharing and its benefits in reduced VMT, reduced fuel consumption, etc. In addition, the RSA usually obtains payment or arranges for payment to

suppliers, for the cost of vanpool and buspool operation. A final value is follow-up information on client needs and satisfaction with RSA services, obtained in discussion or through survey techniques.

Does Figure 3 fit your RSA? Does it omit important publics or value exchanges, or include some that are of little importance to you? It can only be a generalized map of RSA territory. To make it your own present or future map will take your RSA's input and experience.

3.5 APPROACHES TO PROMOTING RIDESHARING

- Perhaps the most important design consideration is to view the RSA as a service organization, not as a data processing one. Then the vital questions become (1) what are this RSA's prime target groups, and (2) what program strategies and promotional approaches will reach each most effectively? ■

Most laymen think that the major problem for an RSA is processing masses of data to match people for carpools and vanpools. As all RSAs have discovered, this is not true. Matching is a necessary support activity, but the major problem, and the most difficult task, for nearly all RSAs is promoting ridesharing. Only in a crisis atmosphere such as a gasoline shortage does promotion effort become less essential, but even then it has a potential task of communicating the opportunity to a public with suddenly enhanced ridesharing needs and awareness.

Ridesharing promotion falls into two general categories: dedicated (via specific organizations to particular target groups of commuters or other travelers) and mass (to the public at large). The first is by far the most important because the organizations facilitate RSA work if properly approached, and because the specific target groups necessary for most successful ridesharing can thus be located and effective promotion techniques for them applied. Mass promotion to the public at large is chiefly of use to build awareness.

Whatever the promotional approaches an RSA chooses, it is important to coordinate the span, content, and timing of efforts. Therefore, a major promotion consideration is the recognition that priorities and schedules must be set.

3.5.1 Dedicated Promotion

Most RSAs begin by trying to reach commuters and do so by contacting them at their place of work through their employer or activity center. Before this can be done, it is necessary to gain the support of upper management at the employing organization or activity center. This may not be an easy task, but all RSAs engage in this type of dedicated promotion to some extent, and many do it quite heavily.

The primary benefits of working through the employer derive from reduced cost and the ability to target specific population segments, tailoring the promotion to their needs. This route also couples the RSA's promotional activities with the moral and other support of the employer.

The minimal RSA objective is usually to obtain the employer's or activity center's agreement to transmit ridesharing information and application forms to workers. This entails only trivial costs for management, but is a passive form of promotion effective mainly for those first acceptors already interested in ridesharing. More effective support involves arranging for presentations by RSA staff, appointing

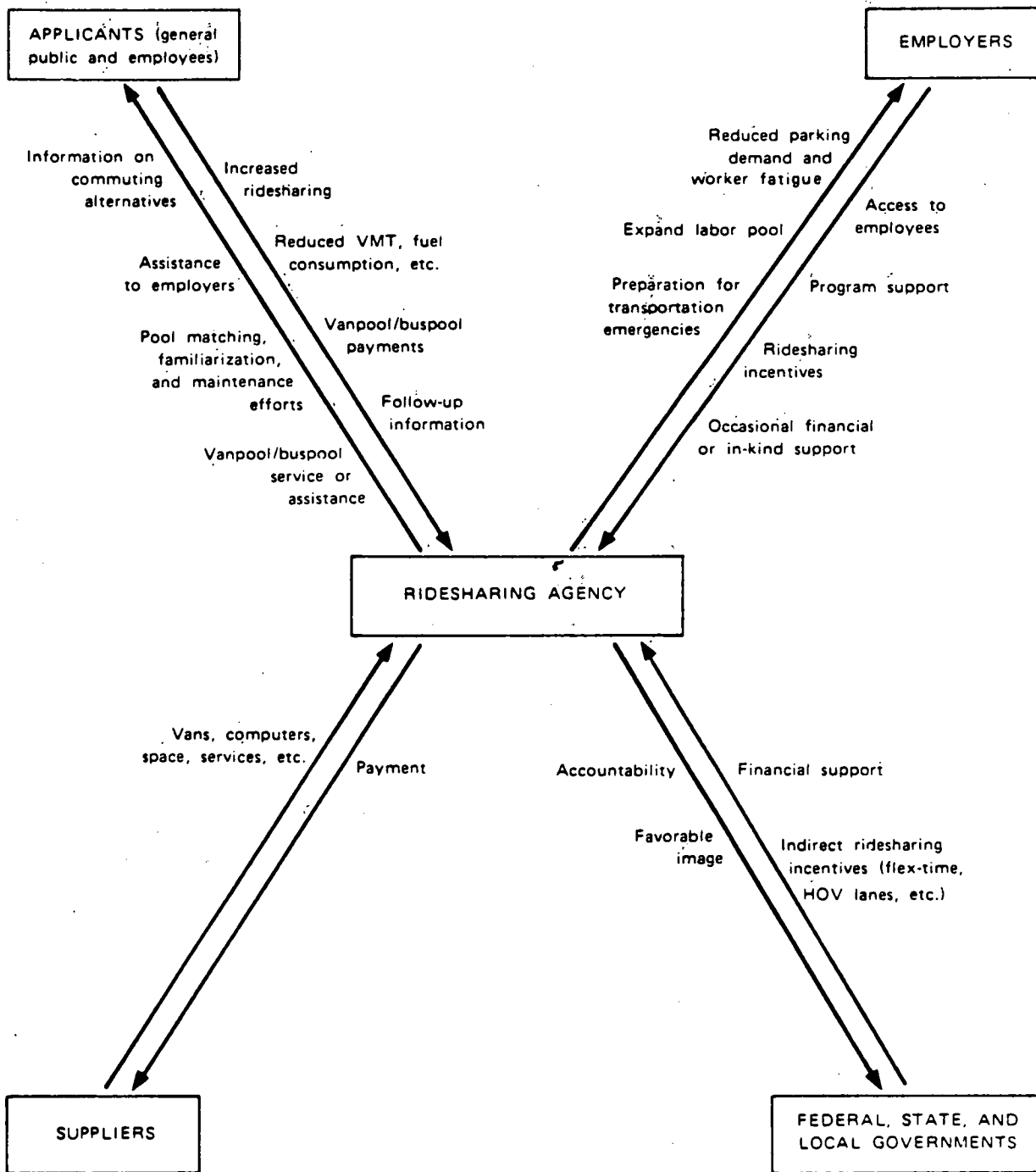


Figure 3. Principal RSA publics and illustrative value exchanges.

an employer or activity center coordinator, and sponsoring employer-based incentives such as preferential parking and flexible arrival and departure times for ridesharers.

How can such cooperation and involvement be achieved? Only by studying the needs of employers and activity centers first, as an RSA does for most target groups of potential ridesharers, then demonstrating how those management needs and important preferences can be met. Chapter One discusses a number of the ridesharing goals that employers have, and Chapter Two details these further in the discussion of approaching employment sites. They include reduced needs for parking and therefore land investment, clearing choked access roads, or providing more auto space of both types for customers. It may also well be that without any parking or access problems, the good public image management can gain from cooperation with energy saving, employee-helping programs will be sufficient. This is likely to be particularly true of energy industries, such as the local utilities or of major traditional employers in a metropolitan area.

There are also management concerns to be allayed. No private employer wants even to appear to force ridesharing on employees for fear of losing them or of triggering union problems. No private employer wants to run the risk of seeming to reduce existing fringe benefits for the same reasons, and because even short of those extreme reactions, employee morale will suffer. Incentives for ridesharing, rather than disincentives to solo driving, will be the approach of choice. The RSA must be attuned to management needs and concerns. It must bring such subjects up to demonstrate credibility as competent transportation help to management. It must demonstrate how management goals can be furthered through active cooperation with the RSA. This requires that RSA staff both maintain and project an open-minded attitude: more interest in discovering the employer's or activity center's pro and con views on ridesharing than in any hard sell of car, van, or bus pools.

The best methods for discovering local management needs and concerns involve preliminary exploratory talks. One effective approach is to go to their organizations first: chambers of commerce and boards of trade. This will not only provide information about the entire employer community but it will also yield valuable referrals to specific top management persons.

Only after such preliminary explorations should program ideas for specific employers and activity centers be fully crystalized and presented to management.

The general process in contacting neighborhood organizations is similar, but a special warning applies. Civic associations, church groups, homeowner associations, and condominium boards are much more loosely organized, and may tend to agree verbally in the spirit of general goodwill in the public interest without necessarily being willing or able to do much. Therefore, preliminary exploration with the leaders will be essential to try to search out good motivation for program support. It must be realized that the best help available from most neighborhood organizations may be providing insight into local resident motivations for ridesharing and pointing out good candidates who might be hired part time as neighborhood coordinators.

After insight and/or support has been gained from the cooperating organizations, the next step is to promote rideshar-

ing to target groups of potential poolers either through RSA coordinators or by working through onsite coordinators. The RSA in either case will be mounting a personalized ridesharing service as discussed earlier in this chapter and further detailed in Chapters Four and Six on planning and implementation. The personalized service in itself is the most powerful promotional technique. In the process, such tools will be used as brochures describing the program, preliminary familiarization meetings so that potential poolers can ask questions, "how to (car) (van) (bus) pool" flyers or booklets, and ridesharing applications forms.

3.5.2 Mass Promotion—Addressing the Public at Large

This promotion uses mass media (radio, television, newspapers, magazines) for two purposes:

1. To encourage interested commuters—that is, first acceptors—to switch from solo driving to a ridesharing mode either on their own or by going to the RSA for assistance.
2. To spread awareness of ridesharing programs and thus set the scene for recruiting in the more personalized arenas where attitudes and behavior change will occur for all but the readiest acceptors.

Where the social climate for ridesharing (see Chapter Two) is already favorable, the media will be supported by word of mouth and positive community experience, and will be much more effective.

The only difficulty with achieving the first objective is that this is an expensive way to go about it, particularly if television and magazines are used.

The second objective must be viewed as a longer range activity because attitudes do not change by media exposure alone. The problem here, in addition to long sustained expense, is that mass media may easily be counterproductive for the more reluctant solo drivers. This is likely to happen unless there is follow-up by discussions at a more personal level, as well as endorsement by "gate-keepers" (those whose opinions are listened to and whose example is followed on a given subject). The negative impact can occur precisely because generalized appeals usually sound so depersonalized, and the vast majority of solo drivers are sensitive on this point. The program experience is that promoting ridesharing to the public at large has proven the least effective route to program success.

3.5.3 Setting Priorities

Although many RSAs will eventually engage in all three levels of promotion (employer-oriented, neighborhood, and general public) to some extent, it is not realistic to expect to be able to do a truly complete job at all three levels simultaneously. Therefore, the final promotion consideration is the recognition that priorities and schedules must be set to (1) determine what emphasis will be given to each level in terms of allocation of RSA staff and budget, (2) coordinate the substantive content of promotion at three levels, and (3) coordinate the timing of efforts at each level. In particular, it is emphasized again that while the idea of "blanketing the area" via the mass media can seem appealing, this is likely to be the route that yields the least response. Particu-

larly until staff acquires experience, beginning in a few places and building up examples of effective ridesharing in the community will assure earlier success. In addition, such examples will provide a base, or reference point, for those people to be reached later by the combination of mass media and personalized matching.

3.6 HIRING CAPABLE ADMINISTRATORS

- Based on both personal capabilities and the RSA's stature, a good administrator is able to negotiate with many political and business sources for the best possible ridesharing program. ■

There is a clear consensus among RSAs and writers in the field that successful ridesharing programs require effective leadership. For example, a recent evaluation of Federally sponsored carpool demonstration programs (2) noted that the effectiveness of a ridesharing program depends heavily on the capability and stature of the program administrator.

To assess a prospective administrator's capability, professional experience, personal references, commitments, and motivation can be evaluated. Typically, good ridesharing program administrators are experienced in management and working with people, resourceful, and highly motivated. Prospective administrators should have proven ability to supervise; delegate work; plan, monitor, and evaluate program objectives; coordinate resources; deal with outside interest groups; and elicit in-house support as well as community support for the program. They must effectively promote ridesharing services to both travelers and community resources. For existing programs, this has entailed:

- Pursuing public and private funding sources.
- Eliciting political support of city, county, and state elected officials.
- Seeking and often gaining the active participation of local employers.
- Promoting joint marketing efforts with businesses and community groups.
- Eliciting the cooperation of local and state institutions, such as transit authorities, MOPs, planning authorities, transportation or highway departments, and other ridesharing agencies.

- Collaborating with insurance brokers for favorable rates.

It appears that the level, rather than the particular specialization, of previous experience is what counts. For example, Wagner (2) also reported that 42 percent of carpool program administrators had professional experience in transportation; 28 percent in marketing; and 19 percent in urban planning or public affairs.

To assess stature is more difficult. In most cases, the ride-share program administrator's stature will be closely related to the ride-share organization's stature and level of funding. Without adequate organizational support or funding, the administrator will have less stature to negotiate with employers or others such as business organizations, transit authorities, and other ridesharing agencies for active participation in their ridesharing program. However, an agency, of course, can benefit from the contacts and prestige brought by a person who is already well known and highly regarded in the community.

A profile of the effective administrator is elusive and difficult to write into a job description. These true vignettes illustrate the potential mixes of administrator and agency sponsor.

A county employee is assigned the new role of ride-share program administrator. Capable, well-intentioned, and informed on ride-share strategies, this administrator assumes the job, but the funding and marketing budgets are low and the staffing is minimal. In short, the county's view of ridesharing is that of a second-class citizen. Stature in this situation would be hard to achieve for the administrator.

A senior planner is hired to direct a newly formed, combined carpool-vanpool program. The several hiring agencies do not concur on his job duties and there are past rivalries that serve as constraints to effective program management.

An administrator with some experience in transportation is hired to direct a prospective vanpool program. The sponsoring agency commits money and staff. In addition, the agency itself has stature in its community and with other local institutions. This program administrator can negotiate and promote the program because of the supportive institutional setting.

CHAPTER FOUR

PLANNING

This chapter is designed for both existing and new RSAs who want to maximize effectiveness by using the results of new behavioral research and of program experience to date. Planning is integral to operations. Here it is based on the range of practical matters that must concern new or existing RSAs. These are: (1) dealing with the RSA working environ-

ment; (2) estimating both consumer demand and consumer potential for ridesharing; (3) specifying your ridesharing services, goals, and evaluation criteria; (4) choosing the organizational form; (5) soliciting external support; (6) promoting ridesharing; (7) defining data processing needs; and (8) planning for transportation emergencies.

4.1 DEALING WITH THE RSA WORKING ENVIRONMENT

4.1.1 Acceptance of Innovation

■ RSAs work in the difficult arena of gaining acceptance for innovation. In this process, the views and concerns of commuters, employers, regulatory agencies and other transportation-related institutions are important. They must be assessed and dealt with in the light of existing conditions and needs as the RSA locates itself in the local technology delivery system for transportation. ■

The fundamental problem confronting a new ridesharing agency is the acceptance of innovation. People are usually creatures of habit and preconception. Travelers have their established methods of mobility, particularly commuting; employers have their established policies of involvement or noninvolvement in employee transportation; public and private transportation agencies have their policies, laws, and regulations; and such auxiliary institutions as insurance companies have their regulations. In addition, the media and the public at large have their preconceptions about ridesharing.

The introduction of a new mode that requires psychological, social, legal, economic, and logistic adjustment is likely to encounter barriers arising from the resistance of prior arrangements to adjustment and change. The most effective method for dealing with this resistance is to develop a program that will either improve on the earlier condition or facilitate its operation (e.g., assisting commuters to reach their mass transit station more easily and inexpensively).

Thus, acceptance will be facilitated by the offering of adequate incentives to overcome the resistance or by the removal of barriers, real or perceived, that have prevented the acceptance of ridesharing.

Much of the planning stage and the operation of a ridesharing program can be conceived of in terms of the ability to achieve the willingness by commuters, employers, and the like, to consider the mode and the specific program offered them and, eventually, to adopt it as a part of their transportation behavior. Each step in the plan and its implementation should be examined in the light of this critical issue.

As noted earlier, all gatekeepers on the route to the development of an effective ridesharing program will want to know, consciously or otherwise, why they should change their existing habits, social relationships, laws, rules, economic arrangements, or schedule. In dealing with each of them, that person's position and that person's decision process must be considered.

4.1.2 Regulatory Environment

As explained in Section 2.9, federal regulations are generally favorable to ridesharing (federal tax laws less so). Also, nonprofit carpools are not usually regulated. However, state regulations can make or break the vanpooling element of a comprehensive program. In the absence of legislation specifically permitting third-party vanpooling, its status must be defined by the public utilities commission or whatever commission interprets and administers public carriers. The state transportation or highway agency should be contacted for an explanation of current ridesharing regulations and other relevant legislation or rules.

4.1.3 Transportation-Related Institutions

Ridesharing, of course, does not take place in a transportation vacuum. Important actors on the scene include the state transportation or highway agency, metropolitan council of governments, the transit commission, city and county traffic departments, and perhaps a metropolitan transportation planning agency. These public bodies should be contacted by private, as well as public, RSAs in this initial planning step to determine their interest and concerns related to ridesharing, because they are important to an RSA for coordination and support. For example, the county FAU (Federal Aid Urban) committees are the only source of nondemonstration federal funds for ridesharing. The RSA must compete with the highway needs in the county for this money.

Speaking more broadly, the state and local highway or transportation agencies should agree that (1) there is a transportation problem, usually peak-period urban highway congestion, that could be relieved by increased ridesharing, and (2) the program proposed by the RSA can result in a substantial increase of local ridesharing. It is clearly in the interest of any RSA to work closely with state and local transportation agencies on both of these points.

Other agencies, such as the transit commission or operator, may be important for political support, or at least for absence of opposition. This is especially true for an RSA that is an independent corporation and not part of some existing public agency.

For instance, the local transit operator may be concerned about competition by an RSA, particularly from vanpooling services. Contacting and working with the transit operator may avoid charges of competition that could negatively affect the RSA's local political support, its state regulatory standing, or its ability to receive federal funds.

This relationship is even more sensitive for an RSA organized as a brokerage operation because transit and the RSA must then work effectively in harmony. For example, the UMTA-sponsored Knoxville brokerage project negotiated a 13-c agreement with KNOXVILLE Transit which requires that it not accept vanpool passengers with both origin and destination in the city of Knoxville and that it not otherwise compete with the transit system. On the other hand, there is interest in ridesharing in Ontario, Canada, among other reasons, to relieve the expensive peak load burdening public transit.

Other types of concerns may be found in a state transportation or highway agency, which is the most common source of both general and special-purpose RSA funding. For example, the EPA requires state DOTs to be responsible for providing ridesharing services in all urban areas that do not meet the federal clean air standards. In southern California the local RSA, Commuter Computer, performs these services under contract to the state DOT (Caltrans); the RSA thus receives political and financial support for that work while Caltrans fulfills its EPA requirements.

There may be other agencies or factors that can affect RSAs. For example, Commuter Computer also provides ridesharing services and emergency transportation plans to employers who are required by the state's local air quality management district to have and to use emergency plans to reduce employee vehicle trips during smog alerts.

Local experience will be helpful to identify the important

entities in the area that should be contacted. Public and semi-public agencies that have been past supporters of ridesharing should be first on the list. Key agencies may be invited to furnish a member for a nonprofit RSA's advisory board or board of directors. Sections 4.4 and 4.5 discuss in more detail the choosing of the RSA organizational form and achieving institutional and political support.

4.1.4 The Technology Delivery System for Ridesharing

One way of approaching and organizing this large assembly of agencies and institutions involved in ridesharing is to conceive of it as a system for the delivery of ridesharing. The concept of a technology delivery system (TDS) is coming into increasing use in transportation planning from the field of energy planning. Its value is that it reveals a full view of the essentials of the working environment. The TDS includes the active organizations directly involved, beginning with funding and promoting agencies such as Congress, DOT, DOE, and the analogous state and local agencies. It proceeds as a delivery system through:

- Those who plan and set up actual ridesharing programs.
- Those who estimate demand and learn about population characteristics.
- Those who provide or purchase vehicles (as for vanpooling).
- Those who finance the purchase of the vehicles and insure their operation.
- Those who promote and market ridesharing to the public and to employers.

In addition, those who regulate or own parking facilities are a part of the system. It also includes the ultimate decision makers: the employers or their representatives, and the travelers who make their choice of travel mode. The regulatory agencies, who control or influence highway conditions for ridesharing, possibly provide support for ridesharing (e.g., demonstration programs), or define its role and status, are a further part of the delivery system. Other agencies such as those governing mass transit, insurance rates, and emergency transportation plans play active contributory roles to the ridesharing TDS.

Considering the delivery system as a sequence of agents provides a useful approach to planning. All active agents can have a facilitating or an interfering role. Their role and authority must be understood, and methods must be developed for enlisting their support or cooperation. Some will play continuing roles, participating daily in the delivery of ridesharing. Others may play more intermittent or passive roles, but none can be ignored because of the risk of interrupting or weakening a link in the system.

The sections that follow outline stages in the planning process. They do not include the most important elements in the TDS. Many are familiar to the transportation community and only need to be taken into planning and program account in terms of their specific roles in, and effects on, the ridesharing TDS.

4.2 ESTIMATING CONSUMER DEMAND AND POTENTIAL FOR RIDESHARING

4.2.1 Introduction

Ridesharing demand means the number of persons or the fraction of the total number of commuters that might switch to ridesharing either directly or indirectly because of the RSA services. The *demand for ridesharing services* refers to requests for expenditure of RSA resources, such as the percentage of employers responding positively to ridesharing promotion by requesting assistance in starting a ridesharing program. Estimating the demand for both ridesharing and ridesharing services in an area will need to be a recurrent process in which all the best clues available are monitored. Whether the clientele to be served includes all the commuters in the state, or is limited to the employees of one company, there is no sure way to predetermine demand. This is not only because ridesharing is new enough to offer limited prior experience as a basis for prediction. It is also because one of the most important roles of an RSA is to help create demand by offering services that appeal to particular market segments; and demand appears to be quite sensitive to such appeals. The opportunity to highlight the benefits of ridesharing and the possible routes to do so should be continually assessed by the RSA.

This section begins with the important matter of investigating the local ridesharing market and techniques for doing so. An account of the experience of other programs is then presented to give the reader a feeling for what has been accomplished in the past and under what circumstances. The section ends with a brief discussion of modeling.

4.2.2 Learning About Local Populations

Any local ridesharing market includes both employers and commuters. Although some of their attitudes and values will be like those of employers and commuters in other parts of the country, many will relate to local situations, local economics (including the characteristics of the labor markets in the area), local customs, etc. To estimate a particular ridesharing market, therefore, will require more than becoming familiar with ridesharing experience elsewhere, useful and necessary as that is. Local commuting attitudes, local preferences and local constraints operating among employers and commuters must also be investigated.

Several sources from which an RSA can identify the concerns of commuters and employers are:

1. This manual and other literature (e.g. Refs. 4, 43, 8, 3), including available local data.
2. Informal polls of employers and commuters.
3. Employer interviews.
4. Small group data gathering techniques involving commuters.
5. Attitudinal surveys.
6. Combining small group and survey techniques.
7. The coordinator as a data source.
8. Tracking the demography of housing income and jobs in your area.
9. Application forms for RSA services.
10. Market positioning.

These sources are discussed in turn. If a new or expanding RSA does not have the resources to pursue all of these sources at the outset, numbers 4 through 7 could be deferred until the program is in operation.

It is important to appreciate that the data gathering processes described here not only are important in the planning stages, but they also are the tools needed for obtaining the information on which to build ridesharing promotional activities and for the formative evaluation of the program so that it can grow in responsiveness to community and traveler needs and situations.

Part of knowing an area involves learning what segments or target groups exist in it. Every city or town separates itself into affiliative subgroups, that is, clusters of people who tend to favor each other's company or feel more comfortable together. These divisions may be geographic, economic, educational, occupational, ethnic, racial, or personal habits. Frequently they are combinations of these variables. Indeed, housing locations may provide a first cut of such subgrouping. Economics, education, and occupation frequently determine where people live and what they can afford. However, even when neighborhoods have developed there are many issues that link, and others that separate, people.

It is possible to learn about the subgroup structure of the community. It is then necessary to consider the other factors that may link or divide the members of a carpool, a vanpool, or a buspool. These are the personal preferences and habits previously noted. Some emerge clearly; e.g., in carpools smoking is a very controversial issue. These predispositions must be considered in the light of people's willingness to consider and accept this new mode.

Two basic elements should be sought: (1) the characteristics and needs of the subgroups and (2) what strategies will attract and motivate each. Both will be used to structure RSA services and promotion.

There are three important warnings to be heeded in this process of getting to know the market segments in the community. (1) The information that can be gained about any population is limited. Do not be overly ambitious. Only a discrete part of an RSA's budget can and should go into this effort. (2) Gathering local data, whether by informal discussions with employers and commuters, or through formal data gathering techniques, means doing "action research." That is, the way in which the community is contacted and dealt with in gathering information will color attitudes towards ridesharing. A cooperative, serve-the-public attitude, combined with sensitivity to employer and commuter points of view will begin to build the perception that ridesharing can be a good thing, and can usefully and safely be accepted as an option. Opposite impressions may begin to undermine the program before it is well under way. (3) It is also vital to evaluate the validity of the information gathered. To whom have you spoken? Do they have their own interests or preconceptions? Has information been sought from balanced sources? Have they explained how they came to these conclusions?

4.2.2.1 *Reviewing the Literature*

Reviewing the ridesharing literature or talking with experienced ridesharing professionals are simple ways of obtaining a good background on employer, activity center, neigh-

borhood organization, and commuter concerns. Many are clarified in this manual and further detailed in the 4-cities study (3). Many similar concerns are revealed across the country. For example, employers new to ridesharing tend to be concerned about the capital and workmen's compensation liability of starting a vanpooling program. Many commuters are apprehensive about sharing a ride with a stranger. However, the ridesharing climate and attitudes vary from place to place and with time. Promotional efforts keyed to one place and time may not be effective for another area. For this reason, the use of one or more of the following sources is recommended.

4.2.2.2 *Using Available Local Data*

Some of the information needed can be obtained by going to existing local data—for instance, police and transportation department records. More can be added by conferring with local government and private transportation specialists. Information can also be found in such sources as automobile clubs. Local government staffs and commercial or marketing firms may be willing to share their data or their experience. One can thus learn a good deal about auto use, parking, effects of fuel availability and price, economic conditions including income and employment changes. Many local businessmen, especially realtors and bankers, know a great deal about the characteristics of neighborhoods and their occupants. These do not exhaust the sources that an inquisitive and perceptive program developer can find in the community.

4.2.2.3 *Informal Polls of Employers and Commuters*

This is a minimum effort RSA staffs can make to become oriented to local conditions. It cannot begin to provide the full information needed, but it does quickly provide some valuable clues. Chatting with 5 to 10 employers or their personnel officers can give an idea of their interest in, and possible concern about, ridesharing. Observations from other ridesharing programs can be tested out on them. A small sampling of commuters can be approached informally through their employers, on the street, or in a shopping center to give their reactions to several questions about ridesharing. For example, commuters can be asked what their feelings would be towards ridesharing with someone they met at a company orientation meeting, versus someone introduced over the telephone. However, they should not be approached when they are in a hurry or enroute to work. Taxing or annoying potential acceptors can only limit ridesharing acceptance.

These quick techniques can give RSA staff a first feeling for the kinds of employer and commute ridesharing reactions in the particular community. By themselves they will be inadequate for assessing local ridesharing interests, attitudes, and barriers; and they should be used only as an adjunct or an introduction to a good acquaintance with the literature and the more systematic and thorough local data gathering techniques suggested in the following.

4.2.2.4 *Employer Interviews*

A series of more extensive interviews, set up by means of appointments with a well-distributed sampling of employers

can be far more productive. These permit exploring in depth an agenda of topics gathered from the literature and informal polls to gain a good understanding of employer concerns and interests. Furthermore, the employers' knowledge of the community can help solve RSA problems throughout the community—an advisory role which most employers find satisfying. To this end, even a carefully structured interview should leave time for open-ended discussion that may yield unanticipated information or feeling from the employer.

Working through the local Board of Trade often provides the necessary entrance. It also has the advantage of presenting the ridesharing program person as one who understands and is sympathetic to the structure and the interest of the business community. There will inevitably be some disappointments; e.g., the employer who wants nothing to do with ridesharing, the one who acts interested but later delays and refuses to follow-up. However, this process is the first step in building future employer programs. It may also be instructive because it may reveal a reason, objective or subjective, why he is not interested. Often valuable information about, and access to, other potentially good collaborators can be gained.

4.2.2.5 *Small Group Data Gathering*

These offer systematic and intensive ways to assess commuter attitudes at less cost in time and money than surveys. The information obtained is more in-depth, although typically the sampling must remain less extensive.

A word of caution is in order when these methods are used with employers. This can only be done successfully in a purely information gathering context; that is, there should be no attempt to obtain a commitment or to enlist cooperation at the information-seeking meeting. Gathering employer representatives in a group in which they encounter the possible "price tag" of program cooperation is most likely to have negative effects on both data gathering and the program.

4.2.2.6 *Decision Analysis Panels*

Decision analysis panels are open-ended exploratory meetings with small, homogeneous groups of employers, employees, or any other population. In such a congenial setting, people can be helped to go beyond surface responses to explore their real priorities and concerns—even when these are not at first easy for them to express. For example, decision analysis panels have revealed the reluctance of certain population segments to carpool with those who are unlike themselves socially, or in terms of job level; the intense antipathy to smoking on the part of those who do object (arguments about smoking can break carpools); the adamant unwillingness of the working mother of young children to give up the solo driving which provides her only solitude of the day, lets her schedule errands in an overcrowded schedule, and which she perceives as the only way she can be sure to pick up her child at the day care center.

The decision analysis panel, as its name suggests, is specifically designed to determine how and on what basis people make decisions concerning ridesharing and other behavior. This dynamic approach requires researchers trained in the necessary social, psychological, or other group dynamic skills to probe gently, but thoroughly, employing the internal feelings and momentum of the group members to bring critical issues and attitudes to the surface.

4.2.2.7 *Focus Groups*

These groups also allow a systematic and in-depth, although more limited, exploration of ridesharing issues. Unless the RSA has a staff experienced in the necessary techniques, focus groups, like decision analysis panels, should be performed by an appropriate consultant. Focus groups are more limited than decision analysis panels, in that although they allow free discussion, data are gathered only on a predetermined set of issues. They are therefore unlikely to produce the understanding of the dynamics of decision-making provided by the decision analysis technique. The drawback of focus groups is that they may miss issues that the staff has not anticipated. However, RSA staff can gather even more from a focus group by a thorough debriefing of the focus group leaders. This has the advantage of bringing out issues which emerged in the discussion, although not on the rating scales provided to group members at the end of the discussion (the formal data product). For example, focus group sessions with employers as well as employees were held during the preparation phase of the Silver Spring Share-A-Ride project. Two important findings from these sessions were that (1) hardly anyone knew about the established regionwide computerized matching service and (2) the few who did know about it were disappointed by the impersonal nature of the service and the lack of follow-up. These findings led to development of a personalized approach for the Silver Spring Share-A-Ride project.

Small group techniques have the advantage of permitting the exploration of complex or sensitive issues that are impossible to treat adequately on a questionnaire. They are also relatively inexpensive and have a quick turnaround time. However, it is easier to ensure adequate representation of a cross section of the commuting population in a stratified questionnaire sample (i.e., one that has been carefully segmented).

4.2.2.8 *Attitudinal Surveys*

Attitudinal surveys are another research tool that can help structure the ridesharing promotional campaign and the services offered. As one example, Tri-Met Rideshare in Portland, Oregon, spends \$10,000 per year on an annual telephone survey by a market research firm to help review its ridesharing program. Originally the program was directed mainly through employers because the survey disclosed that most commuters looked toward their employers for help with transportation problems. In the last year, the survey provided the valuable information that ridesharing in the area essentially complemented transit service rather than competing with it. Tri-Met's technique illustrates another point: planning the program and detecting the concerns of the other actors in the area is an ongoing process rather than merely an initial step in planning.

As a further example of surveys, the New York DOT used a written questionnaire mailed to state employees in Albany to help direct and evaluate an experimental carpool program which led to its using local coordinators to personalize its services⁽¹⁹⁾. The survey asked for both attitudinal and demographic data.

Although they are effective, the foregoing examples of attitudinal surveys do not represent the optimal methods for obtaining information about attitudes or readiness for given behaviors. The very best data are obtained from face-to-face

interviews by trained interviewers under conditions conducive to the full cooperation of the respondent. In addition to the difficulty in obtaining the full attention of the respondent associated with mail or phone surveys, proper sampling is very difficult because only a select group is willing to respond. Improved methods are discussed in the following.

4.2.2.9 *Combining Small and Large Group Techniques*

Probably the most effective assessment of a ridesharing market can be done by combining small group and survey techniques. A series of decision analysis panels or well-debriefed focus groups will provide the issues to be tested out more widely by survey as well as hypotheses concerning the nature of the population and good insights into the dynamics of their decision-making. This allows a far more sensitive and cost/beneficial survey: one tailored to an area and to current commuter concerns. It avoids the problem of a survey based on past experience in other areas alone or of issues that seem “right” to the surveyors but have no empirical base. Again, sophisticated research skills are needed to blend these techniques, and may have to be obtained outside the RSA.

In the 4-cities study completed for this manual (3), the authors employed such a combined method with a national sample of solo drivers. New data were gathered in two phases at four sites: Albany (N.Y.), Houston, Minneapolis, and San Francisco. In Phase I, ten decision analysis panels were held at each site: eight with solo driving commuters, one with representatives from large employers, and one with representatives from small employers. These small group meetings permit exploring in depth commuting perceptions and attitudes, as well as conditions for future travel behavior change. The data from these panels made it possible to develop a survey instrument for Phase II based on current solo driver views of commuting realities and possibilities. This survey was then administered to a new, and much larger, sample of solo drivers in the same four metropolitan areas to provide more extensive quantification and wider generalizability. In the final data analysis, the panel results often illuminated survey findings. For instance, they explained the ambivalence toward ridesharing of blue collar workers evident in their apparently contradictory responses to related survey items. (This occupation group finds the social opportunities ridesharing affords extremely attractive; at the same time, they display great wariness about social interactions during the commute. The panel discussions had revealed how strong are the social networks among blue collar personnel and their fear of tampering with these by confronting such problems as lateness or the personal habits of some colleagues.)

Including both phases, a little more than 1,000 solo drivers and representatives of more than 60 employers were interviewed, for a total sample population (N) of 1,154. The study provided a vastly improved insight into program needs in the 4 cities studied. This included a profile of solo drivers with their universal characteristics and local differences. It revealed the importance of such factors as “hassle,” cost, sense of victimization, the declining demand for independence during the commute coupled with the increasing demand for mastery over the details of any shared commute, the considerable importance of social and status considerations, parking, convenience, and safety. The method per-

mitted recommendations important for new program development including personalization, outreach, delivery systems, what tradeoffs can assist a program follow-up, and how to target the program and the promotion that will gain its acceptance. (Overall results of the 4-cities study are summarized in Chapter One. Findings and recommendations by site and by target groups are summarized in Appendix D.)

Such combined research approaches are relatively expensive. However, once undertaken, follow-up on a national or a local basis may be fairly economical and highly productive.

4.2.2.10 *The Coordinator as a Data Source*

After the program has begun to function, coordinators at both work sites and home-end can become valuable sources of insightful and relevant information about ridesharing problems and opportunities. The coordinators of personalized programs more than almost anyone else will know the populations they serve and the kinds of service that will foster and maintain ridesharing.

Coordinators can be trained to detect specific phenomena long before they reach the critical stage. They can receive and report the complaints and observations of the populations with which they work. Special forms tuned to the reporting function can be prepared, or periodic group or individual discussions can be held with coordinators. They can be very useful in tracking housing and job trends and provide information far ahead of census or survey sources.

4.2.2.11 *Tracking Housing and Jobs in the Local Area*

Keeping track of current and changing demographics will be crucial for an RSA to maintain its effectiveness over time and to respond to changes that affect commuting directly. For example, there is a trend in most large metropolitan areas for the newlywed population to buy homes in the farthest suburbs—a pattern followed mainly by blue collar families in the past. Housing costs have risen so sharply that these are the areas young couples can afford. The long commutes that result, combined with the greater flexibility of the young in terms of commuting (and other) habits, and their severe budget restrictions suggest a ridesharing potential that has not begun to be tapped with program efforts dedicated to this large and growing group.

4.2.2.12 *Application Forms*

The RSA can also obtain information on the preference of its applicants by asking for it on the application forms for matching. Tri-Met Rideshare allows preferences to be indicated on its carpool matching form. The person doing the matching has access to this information and a 50 percent match rate is achieved. This technique is, of course, not available for initial planning of the ridesharing program, nor will it provide in-depth information. However, it can be one source for continued review and revision of plans.

4.2.2.13 *Market Positioning*

This is a process of making a careful study of local conditions and needs in order to identify a viable niche for which a service should be developed and offered

For example, if the local transit operator happens to offer

commuter express bus (or rail) service along all corridors except one, that corridor should be examined as a candidate for a vanpool or buspool. A useful example is offered by Commuter Computer in Los Angeles. The marketing director found that local commuters and employers felt a strong (unmet) need for an emergency transportation system to accommodate gasoline shortages, bus strikes, air pollution alerts, personal emergencies, and the like. This need was so strong, especially among employers, that promotional efforts were reoriented to a theme of "Emergency Ridesharing Registration." The resulting improved employer cooperation promptly produced a doubling of the applications for emergency carpools. This reorientation required major changes in the program, but it was clearly worth the effort.

4.2.3 Results of Other Programs

One basis for estimating demand is to look at the rates of application and pool formation in other programs.

4.2.3.1 Nonpersonalized Carpool Programs

The demand experience prior to 1979 for nonpersonalized carpool matching and promotion programs detailed in Table 8 (and estimated in Table 10) can be summarized as follows:

- Mass media programs reach larger numbers of individuals, providing some awareness of, and information about, ridesharing programs.
- Employer contact programs reach fewer individuals, but appear to have a greater impact and response rate.
- Areawide dial in, or mail in, campaigns employing the media have the lowest resulting application rates.
- When promotion is via media and employer, the application rates improve, but not dramatically.
- When the contact is through the employer and directly to the target audience, rates of application are very markedly higher. (Note that this process introduces the beginning of personalization. See Chapter Three.)
- When area and direct employer methods are used, new carpoolers may be as many as 20 percent of the applicants, and 2 percent to 4 percent of area employment.
- Among new employees reached in the same manner, new carpoolers may exceed old employees by a factor of two times or more.

The experience given in Table 8 covers four measures: exposure to advertising, employer response, applications, and new carpoolers, typically over a period of 1 to 2 years. An RSA using mass media advertising can expect to gain some ridesharing awareness by two-thirds to three-fourths of the area employees. If contact is made only through employers, it is typical for about 25 percent of the employees in an area to be reached. About half of the employers contacted typically respond positively to carpool promotion by at least allowing information to be passed to their employees. However, the carpool application rate for an RSA using only mass media techniques is usually less than 1 percent of those exposed to promotion. If mass media techniques are combined with employer contracts, this rate can rise to 1 percent to 1.6 percent of the entire area population (2.4 percent to 4 percent of area employment). Within a company exposed to

carpool promotion, the application rate in the past has averaged about 25 percent, although it is strongly influenced by company size, the degree of management commitment, and commute circumstances. The proportion of applications received from the general public compared with those received through the employer component of an RSA program is highly variable and depends on the relative marketing emphasis and the ridesharing environment. RSAs like Commuter Computer, Masspool, or Share-A-Ride in Minneapolis, which put most of their effort into employer programs and/or have local statutes requiring either ongoing or emergency employer programs, have expected 67 percent to 95 percent of their applications through employers. Conversely, RSAs that place more emphasis on public marketing can expect to receive proportionately more of these applications directly from the public.

Lastly, in the limited number of nonpersonalized programs examined, about 10 percent to 20 percent of applicants from either area or employer promotion have become new carpoolers. These new carpoolers may average about 0.8 percent of area employment. This includes only direct demand (i.e., those who request matching). If indirect or induced demand is included also, this figure has risen as high as 1.5 percent. Within a company, about 2.5 percent of the old employees have become new carpoolers on the average. However, if nonapplicants becoming new carpoolers during the promotion are also counted, this rate may average 4 percent. On the basis of limited evidence, about 6 percent of the new employees within a company may become new carpoolers (56); this suggests that orientation programs for new employees and follow-up company programs will be highly productive.

All of the programs on which Table 9 is based emphasized impersonal techniques such as mass media promotion and mail-out of match lists. The more personalized techniques described in this manual can achieve much better responses under the same conditions. Nonpersonalized programs clearly make little appeal to any but the readiest ridesharing acceptors. The following summarizes findings from the 4-cities study:

Methods	Positive Response Rates of Solo Drivers to	
	Vanpooling (%)	Carpooling (%)
NONPERSONALIZED		
• Start the pool yourself	11	25
• Send your name into a central computer to obtain a match list	(n/a)	33
• Assemble one yourself from a locator list where you work	(n/a)	40
PERSONALIZED		
• Having a pool organized with the help of a work end coordinator	79	78
• Having a pool organized with the help of a neighborhood coordinator	59	74

Table 8. Summary of demand experience for nonpersonalized carpool matching and promotion programs prior to 1979.

<u>Methods and Measure</u>	<u>Estimated Averages or Ranges (%)</u>	<u>Comments</u>
Exposure		
a. Area-wide, media promotion	66-75	These are the average shares of the total labor force receiving some information about ridesharing programs.
b. Employer contact only	25	This is the average percentage of employers contacted who respond positively to a ridesharing promotion contact.
c. Employer response rate	50	
Application rates*		
a. Area-wide dial-in or mail-in	Less than 1 (exposed population)	Average proportions of given group applying for carpool matching service.
b. Combined area promotion and employer target	1.0-1.6 (entire population)	Average proportions of given group applying for carpool matching service.
c. Within a company	25 (those employed)	
Percentage of applications through employers vs. general public	25-95 75 (typical)	This depends on the RSA emphasis in marketing and on the ridesharing environment. See text.
New Carpoolers		
a. Prospective new carpoolers as a % of applicants	10-20	Combined area promotion and employer targets suggested in (7).
b. New poolers as % of area employment*	0.8-2.5	This includes direct demand only; indirect or reduced demand may raise this range to 1.5-4% (51).
c. New poolers as % of company employment	2.5	This includes direct demand only; indirect demand may raise this to 4% (51).
d. New poolers among new employees	6	Based on limited evidence (56).

*Quoted rate is believed to apply to a period of one to two years.

Sources: 7, updated with information 2, 56, and 51.

It should be emphasized that the main differences between the most and least successful programs on which these averages are based appear not to be the budget, but rather the quality of the organization, the way the money was spent, what groups were targeted, and how the community accepted and felt they were a part of the program (7). Although many of the programs did appear to be limited by funds, there was no direct relationship between success and money.

Thus, the foregoing nonmonetary factors will have a more important role in determining whether the response to your carpooling program is above or below the average of the prior programs. External variables such as transportation emergencies (for example, fuel shortages or transit strikes) can be expected to have a significant impact on ridesharing demand, and recurrent fuel shortages or escalating fuel prices appear to be in strong prospect for at least the immediate future.

4.2.3.2 Personalized Carpool Programs

Information on this type of program is limited because the approach is new to programs, although strongly recommended in the research literature. New York DOT reports that about 5 percent of the state employees they contact in Albany become new carpoolers. This is twice as high as the average direct carpool demand achieved by the more impersonal techniques. Knoxville Commuter Pool, Silver Spring Share-A-Ride, and Minneapolis have demonstrated that personalization increases application rates. A personalized ride-sharing program for the 8,000 employees of Lawrence Livermore and Sandia Labs in Livermore, California, is able to place about 75 percent of its applicants within a week by referring them to existing carpools. Most of the 25 percent who are not placed in a carpool have too many special requests (e.g., long working hours and ride only) to be accepted by the existing carpools with vacancies. Both the carpool coordinator and the applicant are given the other's phone number and are told that the other is waiting for their call. At the time of reporting, 23 percent of the employees in the two companies carpool, which is 17 percentage points higher than before the introduction of the program—over six times the average experience of 2.5 percent cited for non-personalized programs.

4.2.3.3 Vanpool Programs

Because of the personal organizing role usually played by vanpool drivers and the frequent use of vanpool orientation meetings by RSAs, vanpool programs have tended to be much more personalized than carpool programs. However, there is less experience with RSA vanpool programs than carpool programs. Table 9 gives the experience of two San Francisco Bay Area agencies.

With both RIDES and Golden Gate operations focused mainly on San Francisco employment, about 0.5 percent of city employees have joined their vanpools (the number of employer-sponsored and private vanpools is not known). To place this figure in perspective, a vanpool potential of 1 percent of area employment is viewed as between "probably attainable" and "an upper limit" by ridesharing professionals at RIDES and Commuter Computer, and Shearin (11) estimates a 2.5 percent vanpool mode share in a concentrated industrial park with 21,000 employees. The Maryland and Seattle vanpool programs are below even the 0.5 percent level, but growing rapidly; and the geographical configuration of the Bay Area, with many vanpools able to avoid both bridge tolls and queues, probably supports vanpooling.

Table 9. Area vanpool demand.

Agency	Vans Operating by 10/80	Starting Month	Months in Operation
VANGO (Maryland)	268	11/77	35
Commuter Pool (Seattle)	81	5/79	17
RIDES for Bay Area Commuters	242*	3/78	32
Golden Gate Bridge District	131*	10/77	36

*27 of RIDES' vanpools were initiated by Golden Gate and are also included in the Golden Gate total.

The price elasticity of vanpools (relation of demand to price) is not known, but scattered evidence suggests that lower fares can sharply increase demand. One data point is the rapid growth of Commuter Pool's program in Seattle, with a smaller employment base, at fares up to 36 percent (for shorter trips) below those of RIDES or VANGO's leased vans. Commuter Pool achieved low fares by a combination of no-interest financing (through loans from Federal Aid Urban Systems funds), low negotiated liability insurance rates, self-insurance by Commuter Pool for collision and comprehensive insurance, and a state-legislated vanpool exemption from sales and excise taxes. Other examples of lower van fares are provided in Section 4.3 and Appendix E.

Experience with employer-sponsored vanpool programs has indicated that RSAs can expect rates as high as 3 to 4 percent only in circumstances such as unusual management support or high concentration of employees. However, personalization of vanpool services and lower vanpool fares can easily double these rates.

4.2.3.4 Combined Carpool and Vanpool Programs

At the present time it is not clear how much more ridesharing demand is stimulated by offering a combined carpool and vanpool program instead of just one of these services. Current research has not been conducted under the controlled conditions that would provide a valid answer to the question. An upper limit (under average conditions) may be estimated by noting from program experience that there is some overlap of demand between the two ridesharing programs.

The Silver Spring, Maryland, Share-A-Ride program, a relatively new, personalized brokerage program, has been able to place in new ridesharing arrangements 47 percent of all those who applied for service since the inception of the program in September 1979. All had previously been solo drivers.

Survey and modeling results in Ref. (11) suggest that the vanpool-carpool split within a concentrated employment area may be 15 to 20 percent vanpool, or about a 2.5 percent switch to vanpools and an additional 9 percent switch to carpools. In less concentrated areas, typical of whole urban areas, the vanpool share would probably be less, and it could be much higher for individual employers.

At the Lawrence Livermore Laboratory, carpooling in March 1977 (i.e., before the current personalized ridesharing program) had involved 750 employees or about 12.1 percent of employment, with 11 percent divided almost equally between carpools and commuter buses, 0.2 percent by vanpools, and 0.9 percent by transit. By January 1980, 42 percent of the employees were ridesharing, with 23 percent arriving in carpools, 11 percent in vanpools, and 4 percent each by commuter bus and transit. Thus, about 55 percent of total pooling was by car and 26 percent, or about half as much, by vanpools. About one-fifth of existing carpools switched to vanpools, and new applications are now running about two to one in favor of vanpooling. In part, the high vanpool share at Livermore can be explained by the Laboratory's isolation (20 to 50 miles) from several of its labor pools and, in part, by its promotion and facilitation of low-cost driver-owned vans. See Section 4.3.2 for details on vanpool costs, and 6.4 for a full account of the Livermore ridesharing program.

Although impressive, Lawrence Livermore's ridesharing levels are not unique, and other firms, such as Tektronix in Beaverton, Oregon, have passed the 40 percent ridesharing mark.

4.2.4 Modelling

If an RSA follows through on the local investigations of ridesharing demand suggested in 4.2.2, very little can be added by using existing available demand models. This is primarily because available models are based on past experience and are, therefore, insensitive to innovations; and, secondly, because they are constrained by many assumptions that do not operate in the real world. An example is the assumption that human behavior is determined by full knowledge of all available choices and fixed decision rules based only on economic criteria. Human preferences, rigidities, and frailties are neither considered nor measureable for purposes of current modeling techniques.

The staffs of metropolitan planning organizations or state and national government agencies may be better able to work with ridesharing models of the disaggregate type because they have the staff and budget resources needed to adapt models to local needs. Even so, their use is more suitable for travel analysis (e.g., determining mode elasticities) than for demand forecasting. Sketch planning models are generally simpler, more easily understood, less expensive, and more adaptable for forecasting purposes.

In concluding this section, an example is given, in Table 10, of the effects that one such model predicted for Washington, D.C., from various changes in carpooling incentives. To represent parking incentives in the model, excess time of solo drivers was increased and that of carpoolers decreased. Employer incentives were represented by assuming that the carpooling incentives of all employers had effects like those of the Federal Government employers. These include providing preferential parking for carpoolers or providing parking for carpoolers only—an extreme assumption because private employers do not restrict parking so severely.

The results indicate that the more effective policies for increasing the ridesharing mode split are those that give a time advantage to carpoolers compared with solo drivers: the parking incentives policy and the employer incentives policy. The effect of increasing parking costs was not nearly as persuasive a policy as the employer and parking incentives until all work trips incurred a \$3 parking cost increase. Gasoline rationing and price increases also had much less effect. The spurt in ridesharing because of 1979 gasoline shortages and price increases seems to belie those results, although other factors such as "gas lines" may have been responsible for the effects. The effect of the indicated incentives remains untested in most areas.

4.3 SPECIFYING RIDESHARING PROGRAM GOALS, EVALUATION CRITERIA, AND SERVICES

During program organization, the ridesharing services the RSA expects to offer, at least at the beginning, and the main program goals the RSA will try to attain by offering such services should be developed.

4.3.1 Goals and Evaluation

The next step is to prepare an explicit statement of these

Table 10. Predicted impact of carpool policies.

Carpool Policy	WORK TRIP MODE SPLITS			Added Percent Ride-sharing
	Drive Alone	Transit Passenger	Shared Ride	
Base Year - 1968	52.9%	14.5%	25.4%	
Parking incentives	47.2	14.6	31.0	+5.6%
Employer incentives	50.8	13.8	29.6	+4.2
Parking cost increase				
CBD only:				
\$1.00	51.7	15.4	25.7	+0.3
\$2.00	50.6	16.3	25.9	+0.5
\$3.00	49.6	17.1	26.2	+0.8
Areawide:				
\$1.00	50.2	16.0	26.5	+1.1
\$2.00	47.4	17.6	27.8	+2.4
\$3.00	44.6	19.2	28.9	+3.5
Gasoline rationing*	48.0	16.3	27.5	+2.1
Gasoline price increase:*				
100%	52.2	14.9	25.8	+0.4
200%	51.4	15.2	26.2	+0.8
300%	50.6	15.6	26.6	+1.2

Source: Ref. (57) gasoline rationing and gasoline price increase estimates include the effects on weekend travel

services and goals, along with projected levels of attainment for the first year or two. This statement should be developed carefully because it will be required for gaining funding, securing political support, establishing an effective promotion program, and for evaluating the performance of the RSA.

Evaluation criteria should also be specified at the outset so that everyone will know how the performance of the RSA will be measured. Ideally, the degree of attainment of all goals should be measured. In practice, however, some goals may be too difficult to measure (e.g., reduced traffic congestion) and other goals may simply be unquantifiable (e.g., reduced driving tension). Most RSAs are funded largely by local or state governments, and these funders tend to be most concerned with communitywide benefits or those that affect a sizable or critical population segment.

Prevailing practice among RSAs reflects these constraints by limiting evaluation criteria to a small number of important and quantifiable results. From those the following general effects can be calculated:

- Reduced energy consumption, or reduced gallons of fuel consumed.
- Reduced air pollution, in tons per day.
- Reduced parking space needs.
- Commuter cost savings.
- Cost/benefit ratios, if desired.

Much evaluation information can be obtained from two basic parameters that are often used as evaluation criteria: (1) reduction in vehicle-miles traveled (VMT) and (2) reduction in vehicle-trips (VT).

In addition to such criteria, it is customary to report (3) the number of applications for matching assistance processed and (4) the number of persons placed into ridesharing

modes. Although these are operating data, they do provide feedback concerning some aspects of the program. In addition, (5) the number of pools maintained for a year, (6) the number of dissolving pools rescued (or re-formed), and (7) the number abandoned are more useful evaluation criteria. Along with the number of pools, (8) the number of ridesharers gained, maintained, and lost are important.

A primary objective of evaluation is to provide understanding of the causes of success and failure so that the program can be improved. This will require data gathering procedures such as those discussed in Section 4.2.2. Evaluation to assure constructive program change is further discussed in Section 6.8.

4.3.2 Ridesharing Services

4.3.2.1 Carpool Services

Both personalized and nonpersonalized services were discussed in Section 4.2, as were combined carpool and vanpool operations. Further information is needed, however, about the types of vanpool operations possible. An assessment of these options and decisions is an important planning task for any RSA as to which will be offered.

4.3.2.2 Vanpool Options

An RSA has the choice of offering three basic types of vanpooling arrangements, but there are also several combination forms from which to choose. The basic types are employer-operated, owner-operated, and third-party, in which the RSA itself or some other agency such as a state department of transportation or energy offers the service. Operators can either own or lease the vans they offer. Owner-operated vanpools are small nonprofit businesses for the drivers, which permit obtaining personal vehicle rates on insurance and avoiding registration with state public utility commissions as a public carrier.

Among the combination vanpooling arrangements are the following examples.

- An areawide third-party program (Knoxville) has sold its vans to the drivers, thereby converting itself to support of owner-operated vanpools.

- A corridor-oriented third-party program (Golden Gate) offers its own "seed" vans for limited term use in forming pools, which are then invited to convert to one of two other forms:

- leasing from the areawide third-party vanpool operator (RIDES, Inc.) or other sources, or
 - purchase of vans at retail prices, insured privately and financed 100 percent with local banks.

- An employer can begin a vanpooling program with minimal effort by inviting the third-party operator to market vanpools among its employees. Once this idea catches on, the employer can either begin his own program or facilitate owner-operated pools among his employees, or both.

- Another option exemplified by Detroit Edison and Michigan Bell provides for the development and marketing of the program by a consultant (third party) and the maintenance, insurance, and operation of vehicles by a private leasing company, such as Van America Network Inc., Avis, or Hertz.

Given evidence of their need, the success of, and demand for, vanpooling services are probably most sensitive to the price of the service and to the incentives offered the driver. The burden on company management is also a consideration for employers who sponsor their own or owner-operated vans. Because the three types of vanpool options differ in these characteristics, RSAs are faced with three important vanpool planning decisions.

1. Will the RSA offer third-party vanpool service or promote employer and owner-operated vans?

2. Which form or configuration of services will be offered?

3. How will the RSA allocate its marketing efforts between the different forms of vanpool ownership? (if more than one is chosen).

These decisions are related, sometimes in subtle ways. For example, an RSA that finds itself with a third-party vanpool program may tend to promote that form, forgetting its role as a broker. As a broker, the RSA would inform an employer of the whole range of vanpool options, and let the employer decide what is best. For this purpose, development of a concise brochure or presentation is suggested that covers at least the following points. These are also relevant to the RSA's choice of what type of vanpooling services it will emphasize in its own work with the public.

- Under favorable financing and insurance arrangements, the owner-operated van can offer substantial savings in rider costs over third-party vanpools. This is illustrated in Table 11, which compares estimated 1981 costs for owner-operated vans in the San Francisco Bay Area with two third-party systems, one operated by the California State Department of Transportation (though the San Francisco Bay Area is excluded from the offer) and the second by the areawide San Francisco third-party operator, RIDES. In this comparison, the main sources of the significant savings (27% to 57%) for owner-operated pools are lower insurance rates, avoidance of leasing company fees, somewhat better financing, and tax benefits to the driver from deduction of the financing charges. Table 12 shows a more detailed comparison of owner-operated vans with third-party leases from a year later, illustrating both these differences and the sharp rise in van fares over a year's period. Neither Table 11 nor Table 12 allows any credit for the possibility of a substantial residual value for the owner-operated van after 5 years, which makes the owner-operated cost quite conservative.

- The rider fares of employer-operated vans would usually be much lower than the third-party systems illustrated, assuming the good terms for vehicle insurance and financing that are typically available to large employers, plus tax credits and depreciation writeoffs. Differences in employer accounting for vanpool costs and subsidy practices contribute to a wide range of fares among employer-operated vanpools.

- Owner-operated vans tend to offer greater incentives to the driver and to decentralize pool management functions, in both cases because the driver is in business for himself. For example, the driver of an owner-operated van on the whole tends to be more aggressive about maintaining pool member-

ship, replacing lost members promptly, and maintaining the van; hence there are fewer problems about these matters that come to the program manager's attention. The decentralization also reduces management overhead costs.

- Owner-operated vans are much less of a burden and risk for an employer to organize than employer-operated vans because the owner takes responsibility for van insurance, financing, maintenance, and operation. The employer's responsibility is even lower in an area such as Knoxville where the RSA assists employees directly in forming such pools. However, even in such a case, an employer ridesharing representative or coordinator is very useful for companies of any size (see Section 6.5 for details).

- Third-party vanpools are also a low risk management burden for an employer. In addition, third-party programs are effective in serving multiple employers, which can substantially increase the number of potential pools. An RSA vanpool service designed to facilitate owner-operated vans can also produce multiple-employer service. However, multiple employer pools are regarded unfavorably by some employers for competitive reasons because of prospective loss of proprietary information or even of employees to other companies represented in the pool. Typically, these are high technology or competitive companies, as in industrial parks, rather than firms in office complexes or central business districts.

- Third-party vanpools do offer lower financial risk to drivers than owner-operated vans, broadening the vanpool market to drivers who are unwilling or unable to obtain the necessary financing.

In reaching its decision about the desirability and form of a third-party vanpool program, the RSA should project its future vanpool market carefully, taking into account the cost and incentive advantages of owner-operated vanpools and the lower financial risk of third-party vans. When a ridesharing program is small or new, probably encouragement of employer-sponsored and owner-operated vans makes the most sense. However, third-party vans can complement these two types and increase the total vanpool market. See the next subsection, on state vanpool programs, for one interesting resolution of the problem.

Further details on third-party vanpools, including the Knoxville and Golden Gate programs, are provided in Appendix E. Methods for estimating vanpool demand were cited earlier in this section, though that art is still too new to produce highly reliable and price-sensitive results.

4.3.3.3 State Vanpool Programs

The nature and scope of state-sponsored vanpool efforts can also affect the RSA's choice of a vanpooling strategy. At present, there are three distinctive types of state vanpool programs.

1. Marketing vanpooling to employers, typified by the New Jersey and Texas programs. (See Ref. (58), and Texas DOT for details.)

2. Offering vanpool services to state employees, as in Michigan and New York. (See Ref. (58) on Michigan's program and the New York State DOT for information on its program.)

Table 11. First year cost comparison for owner-operated vans and third-party leases (1981 estimate).

	Owner Operated	Third Party Lease
Monthly fixed costs		
Loan amortization ^a	\$291	\$313
Leasing company fee	—	35
Insurance ^b	46	65
Registration fees	14	14
Tax credit ^c	(40)	—
Subtotal	\$311	\$427
Monthly operating costs @ \$0.19/mi. for 60 mi. rd. trip, 21 days/mo. (Gas at \$0.14/mi., 10 mpg @ \$1.40/gal; maintenance at \$0.03/mile; tires \$0.015; oil \$0.005.) ^d	239	239
TOTAL	\$550	\$666
Monthly fare per rider		
14 passengers	\$ 39	\$ 48
12 passengers	\$ 46	\$ 56

^aFleet cost of fully equipped Dodge Royal Sportsman Maxiwagon is \$12,000 for third party lease, including 6% sales tax, vs. \$12,500 retail price and sales tax for owner operated van. Owner operated financing is a 60 month, 100% loan at 14% interest. The third party lease is a 50 month, 90% loan at 16% interest, with the last 10% repaid by the residual value of the used van. In addition to these costs, the third party lease currently requires a \$500 deposit by the ridesharing agency to guarantee each van's lease payments.

^bThird party lease insurance coverage includes \$1 million bodily injury liability plus \$1 million/\$1 million excess liability; \$250,000 property damage liability; \$15,000/\$30,000 uninsured motorists; \$5,000 medical payments; and \$100 deductible comprehensive plus \$150 deductible collision, self-insured by the RSA. Owner operated insurance coverage is as recommended in Appendix C.

^cFirst year tax credit assumes a 30% marginal income tax rate for the driver (25% federal, 5% state) on deduction of combined sales tax and finance charges. The tax credit declines each subsequent year (e.g., to \$34/month the second year).

^dThird party maintenance costs may increase by about \$0.01/mile for each 30-mile increment and over 60 miles trip distance.

3. Offering third-party vanpool services statewide, which is done in Massachusetts, Michigan, Minnesota, Colorado, and California. (See Caltrans in Sacramento, Masspool in Boston, or Michigan DOT for further information.)

Rider costs for the California program, which began in August 1979, are given in Table 12. Costs for trips of comparable length in the Massachusetts program, which also began in 1979, are about \$4 higher. If experience in these 5 states is favorable, they could become models for other states, thereby reducing the need for RSA-sponsored third-party service.

4.3.3.4 Buspools

Buspools require more concentrated groupings of employees than vanpools or carpools. They are often a response to special requests or marketing efforts, so the demand for buspools is hard to estimate in advance. It is therefore recommended that the need for buspools be considered on an individual basis, once the RSA is set up and operating, rather than becoming an object of an advance planning decision. Typical buspool operations are described in Appendix E.

Table 12. Monthly rider cost comparison for 1980 vans (as of August 1979; 14 riders plus driver).

Round Trip Miles	Owner a Operated	Third Party Services		%Increase of RIDES Over Owner Operated
		Van Pool Services Inc. b	RIDES, Inc. c	
25	\$21.75	\$32.00	\$34.25	57%
35	23.75	34.25	36.25	53
45	26.25	36.25	38.50	46
55	28.75	38.50	40.50	40
65	31.00	40.50	42.75	38
75	33.50	42.75	44.75	33
85	36.00	44.75	49.00	27

^aAssumes comparably equipped vans, 12% interest, a 60-month 100% loan with deferred first payment, and 25% first year tax credit on \$2,000 of deductible interest charges and sales tax.

^bA division of Chrysler Corporation operating under contract to the State of California.

^cVans leased from Van American Network, Inc. under contract to RIDES, Inc., a nonprofit Bay Area ridesharing corporation.

Source: Ekistic Transportation Systems

4.4 CHOOSING FORM OF ORGANIZATION

Five common types of RSA organizations are listed, of which the first four types are sponsored by a government agency:

1. Affiliated with a metropolitan planning organization or council of governments.
2. Affiliated with a city or county department or agency.
3. Affiliated with the city or metropolitan transit operator.
4. Affiliated with a department of state government, usually the state DOT or Department of Energy.
5. Independent nonprofit corporation.

Examples of each type of RSA were given in Table 6. In addition, there are RSAs operated by a university and by chambers of commerce (as in Louisville, KY). Although these tend to be exceptions, the choice of organizational form depends very much on local conditions and the level of ridesharing interest and support available from different organizations. Therefore, unorthodox sponsors should not be rejected without fair consideration.

Table 13 gives the distribution of the 50 FHWA carpool demonstration projects that were surveyed in Ref. (2) by lead, major, and minor affiliation with seven types of sponsors. Chambers of commerce sponsors are grouped as a "business" affiliation with nonprofit corporations. Note the high frequency of a major role other than the lead role for most types of affiliation, which suggests the possibility of multiple affiliations as in agencies, such as Masspool, that are government-sponsored but have a nonprofit affiliate for operating vanpools.

MPOs are the most common lead agency, and business or nonprofit corporations are the least common. However, frequency of occurrence is not necessarily an indicator of relative desirability or effectiveness for an RSA organization form. Instead, the criteria given in Table 14 are proposed

Table 13. Local ridesharing agency types and roles.

Affiliations	Role Played for all 60 Projects			
	Lead	Major	Minor Secondary	or None
MPO	43%	2%	12%	45%
City of county	22	15	12	52
Transit operator	12	7	28	53
State department	17	30	15	38
Business or non-profit corp.	5	13	27	55
Consultant	0	12	30	58
Univeristy	3	18	10	68

Source: Ref. (2) and Crain & Associates. Columns may not add to 100% due to rounding.

Table 14. Illustrative criteria and ratings for five forms of RSA organizations.

Criterion	Rating by Type of Sponsoring Agency				
	MPO	City or County	State	Transit Operator	Private Non-Profit
1. High visibility and the image of solidarity and continuity	—	—	—	—	—
2. Client and service orientation, responsive to the public as well as to local employers	—	—	—	—	—
3. Independence and flexibility to explore new ideas and act quickly in emergencies	—	—	—	—	—
4. Adequacy and stability of funding	—	—	—	—	—
5. Encouragement and easy use of donated financial support	—	—	—	—	—
6. Facilitation of private employer commitments to ride-sharing	—	—	—	—	—
7. Ability to interact successfully with legislative bodies	—	—	—	—	—
8. Ability to participate readily in transportation planning activities	—	—	—	—	—
9. Other?	—	—	—	—	—

which are based in part on organizational criteria suggested by Davis et al. (53), and by Johnson et al. (7), and in part on the survey of RSAs conducted for this manual.

In planning an RSA, it may be useful to evaluate the projected organization in terms of the criteria in Table 14. You may want to assign weights to the relative importance of each criterion. If they are of equal importance (12½ percent each), the ratings would be additive, but, of course, if variable weights are used, the weights must be multiplied by the ratings you assign before adding them. Whether such a quantitative step is a help to decision-making is a very individual matter.

4.5 SOLICITING EXTERNAL SUPPORT

Outside support can come to an RSA in several forms: money, loaned personnel, donated services or equipment, endorsements, or indirect ridesharing incentives, such as high occupancy vehicle lanes and air quality regulations. The sources may include federal, state, or local public agencies concerned with transportation, air pollution, or energy conservation; state or local elected public officials; large private employers; civic organization; the mass media; equipment manufacturers; and many others.

Each RSA will probably find that one or a few of these sources are key to its success, but it may be difficult to predict in advance which one. In general, of course, the more promising candidates there are, the better.

Considering in turn the forms of external support, the primary form for all RSAs is usually money. The major sources of financial support are local, state, and federal government agencies. Most RSAs are part of a local or state government and are funded largely by their parent agency, though often in part with funds from a higher level of government. Even nongovernmental RSAs derive most of their funding from one or two government agencies.

4.5.1 Federal Funds

The major sources of funds for ridesharing activities are Federal-aid highway funds, which include:

- Federal-aid primary.
- Federal-aid secondary.
- Federal-aid urban system (FAU).

These funds can be used in a wide range of activities to encourage and promote ridesharing. The ridesharing activities need not be restricted to any Federal-aid highway system, but they cannot be used for projects that will encourage substantial numbers of transit users to switch to carpools or vanpools.

The largest source of funds is Federal-aid urban system funds. Approximately \$4 billion per year is currently available in theory for ridesharing activities. However, this source of funding, along with the primary and secondary funds, is also a source of funding for highway construction projects. The decision to use Federal-aid funds for ridesharing is made by each state and, with respect to urban system funds, by state and local officials.

Since 1974, over \$100 million in Federal-aid funds have been obligated by states and urbanized areas for ridesharing projects. The largest commitment of these funds for ridesharing projects has been in the last two years. The commitment of Federal-aid funds was \$13 million in 1978 and \$41 million in 1979.

Federal-aid funding for ridesharing activities is now administered under the authority of Section 126 of the Surface Transportation Assistance Act of 1978 (STAA). The STAA has repealed the authority under Section 3 of the Emergency Highway Energy Conservation Act, including the 1974 and 1976 amendments. The same types of projects are eligible for funding under the STAA as before, but with the following funding changes:

- The demonstration status has been dropped from the

ridesharing program and has been made part of the regular Federal-aid highway program.

- The special 90 percent Federal share for ridesharing projects has been eliminated. They are now funded under the regular 75 percent Federal share.
- Federal-aid secondary funds in addition to primary and urban system funds can be used for ridesharing projects.
- The 4-year limit for repayment of interest-free vanpool acquisition loans has been extended to the passenger service life of the vehicle.
- The 1-year limitation of protection of financial loss due to a vanpool being "aborted" has been eliminated.
- The \$1 million limit per ridesharing project has been eliminated.
- Carpool parking facilities may be constructed outside the central business district. Such facilities need not be located in conjunction with any existing or planned mass transportation service, but should be designed to accommodate mass transportation in the event such service may be developed.

In the State of Washington the same FAU funds are being used twice. The Seattle/King County Commuter Pool is borrowing uncommitted FAU funds to acquire vans. They are using FAU funds that would normally be committed to a highway construction project that will not be built for several years because of the long-term planning and design process of highway-related construction projects. When the van acquisition costs are repaid through user fees, these funds can then be committed to the original highway construction project.

Other Federal Highway Administration funds, specifically highway planning funds (both PL and HPR funds), can be used for the planning and development of ridesharing activities. These funds are, however, very limited. The decision to use these funds for ridesharing activities is made by the state with respect to HPR funds and by local officials through the metropolitan planning organization with respect to PL funds. Both of these funds can participate in 80 percent of the costs. For further information on the use of Federal-aid and highway planning funds for ridesharing activities, contact the Federal Highway Administration division office in your state.

Section 5 funds from the Urban Mass Transportation Administration (UMTA) may now be used for ridesharing activities. A broad list of items is eligible for funding under Section 5 with a required match of 80 percent Federal/20 percent local for capital items and 50 percent/50 percent for operating costs. (This does not include fare subsidies, however.) Localities are encouraged to maximize their use of FAU funds where available before using Section 5. Several areas are currently planning to use Section 5 funds to support ridesharing projects as part of the National Ridesharing Demonstration Program. These include the State of Georgia, the cities of Jackson, Miss., and Lincoln, Neb., as well as the Regional Transportation Authority in Chicago. In addition, UMTA Section 8 planning funds have also been used to fund ridesharing planning-related activities.

Funds are available under the Clean Air Act (Section 175) for planning, developing, and implementing ridesharing activities. Construction and capital equipment expenditures are excluded. These 100 percent grants are only available to

areas requiring an extension beyond 1982 to attain ozone or carbon monoxide standards. The eligible grant recipients can be any organization of local elected officials with transportation or air quality maintenance planning responsibilities that is recognized by the state. For further information on the use of Section 175 funds for ridesharing activities or area eligibility to receive these funds, contact your Environmental Protection Agency regional office.

Funds are available under the Energy Policy and Conservation Act of 1975 (Section 362) for ridesharing activities. Capital equipment expenditures and subsidies are excluded. The major thrust of the Department of Energy program has been to conduct vanpool workshops for employers, to start ridesharing programs for state employees, and to eliminate state regulatory barriers. The funds are dispersed to all state energy offices based on a formula grant basis that includes population and expected energy savings. For further information on the use of these funds for ridesharing, contact the Department of Energy regional office or state energy office.

4.5.2 State and Local Funds

State and local sources of funding for ridesharing agencies have included metropolitan planning and transit organizations, cities, counties, state DOTs and energy departments, major employers, and chambers of commerce. It is fairly common to have more than one source of funding, and RSAs report two advantages to that arrangement: (1) greater stability in funding, because ups and downs and timing of different sources tend to be complementary; and (2) more flexibility in operations, because desirable expenditures that are proscribed by one funding source can often be made from another source.

Funds from many of these local sources can be used to match Federal funds or to support ridesharing in the absence of Federal funds. For example, at the conclusion of an UMTA-funded vanpooling demonstration, the Golden Gate Bridge Highway and Transportation District plans to use local revenues to support the continuation and expansion of a ridesharing program.

Many states have been increasingly successful in developing innovative ways to provide the necessary matching funds. For example, the State of Connecticut has set aside \$800,000 of interstate transfer funds for ridesharing purposes to be matched entirely by contributions from the private sector. Connecticut General Life Insurance Company has already committed \$75,000 for this program. Thus, the state has used this private contribution (25% local share) to leverage \$225,000 in Federal-aid interstate transfer funds (75% Federal share) for ridesharing.

Many carpool/vanpool projects are utilizing the value of donated services as part of their local match for obtaining Federal-aid highway funds. Donated services or equipment such as public service announcements, loaned personnel, and computer hardware and software which can be properly valued and which could have been purchased as an eligible expense with Federal-aid highway funds may be used as the local match for these funds. There may also be tax advantages to companies that donate either funds, services, or equipment for ridesharing programs.

When using Federal-aid highway funds for vanpool acquisition projects, a source to consider for local matching funds

is a bank loan. This cost, including interest, could then be recovered through the user fee mechanism which is required to repay the Federal-aid funds.

4.5.3 Private Sector Funds

A final, and extremely important, source of funds is private sector funding. As mentioned in the state and local funds section, public ridesharing programs are using private funds to match and supplement Federal funds. The potential of this source may prove to be significant as more companies become interested in ridesharing and with the growing availability of financial and tax incentives. Ridesharing programs should not overlook the importance of the private sector in supporting ridesharing programs.

4.5.3.1 Loaned Personnel

Loaned personnel have proved valuable to several RSAs, especially during the first year of operation when staffing and management is stabilizing. Both the private and public sectors can have motives, such as favorable publicity, for loaning staff to the RSA, and occasionally for donating equipment or supplies. One caution about accepting the services of loaned staff: be explicit about the skills and experience needed to carry out the work of the RSA. Especially in their first year, RSAs need enthusiastic and competent staff.

4.5.3.2 Donated Services or Equipment

Donated services or equipment can sometimes have great monetary value to an RSA, while often costing the donor little or nothing. Examples of this are computer time or programming, public service announcements on radio and television, and surplus equipment or furniture.

4.5.3.3 Endorsements or Testimonials

Good-will endorsements or testimonials by respected political or business leaders, well-known scientists and engineers, are highly useful in advertising and other media marketing. The good will and acceptance that they create can be the most important result of external support, and at little cost to the RSA. There is no standard formula for success, because the particulars must be tailored to each local area. Some possibilities to solicit are the governor, the mayor, the chief executive officers of major private companies, union leaders, university professors, and local sports, radio or television personalities. Each will gain the attention and serve as an exemplar for given population segments.

4.5.3.4 Indirect Support

Besides these forms of direct support, there are many indirect ridesharing incentives administered by local, state, and national agencies—for example, preferential parking, high occupancy vehicle lanes, and gasoline rationing. Also, several RSAs, including Denver, Los Angeles, and Boston, have found that local air quality regulations can be a powerful source of indirect support for the RSAs efforts—especially if these requirements have been developed so as to involve integrally ridesharing. In the near future, energy related regulations of a similar character may emerge. *Even at the planning stage, and especially at the operations stage, the RSA*

should be working aggressively with these regulatory bodies to develop and assist any incentive programs and regulations that involve or affect ridesharing. The full range of such ridesharing incentives is given in Table 5 and discussed in Chapter Seven.

4.6 PROMOTING RIDESHARING

Convincing the public to accept ridesharing is a complex process. It is a blend of public information, communication, acceptance of innovation, marketing, and social psychology in service to the public. It is an attempt to communicate with people, not to convince them to buy a product, but rather to increase their receptivity to an activity that will benefit themselves and their community. Subsequently, it is hoped to get them to change their behavior and become regular carpoolers, vanpoolers, or buspoolers. In this focus on consumer interest and the public interest, ridesharing programs are similar to other public service programs.

4.6.1 Understanding the Process of Innovation from Experience in Nontransportation Fields

Anyone who has ever tried to induce the American commuter to a vanpool or carpool knows very well that (1) this represents an innovation and (2) innovations are not easily accepted. Experience with the acceptance of innovation in other areas can provide insights. The example of the U.S. Agricultural Extension Service (see Chapter Three) built its success on what amounts to personally available coordinators: agricultural extension agents within farming regions who understood not only regional farm problems but regional farm people—their desires, goals, fears, and constraints. Another critical feature of the Department of Agriculture work involved learning which other people were regarded by farmers as models and exemplars, or gatekeepers. This was usually the successful farmer. The application to other population segments should be evident.

Most studies of innovation have noted the “first acceptor” phenomenon, as well as the staff demoralization it can produce unless it is fully understood. Most worthwhile programs will receive an initial response from ready acceptors. These are people who are ahead of the program: they have thought out their problems, want the service, and respond quickly. Program staff are rewarded for merely publicizing the program. However, when this wave of acceptors has been satisfied there is usually a large falling off in consumer response. The next potential acceptors are not so ready, but require different approaches and more intense efforts. If the staff is not prepared for this, confusion and demoralization result. Frequently, the remark, for example “carpool and save money,” is repeated with increasing force, thus discouraging consumer response further. The staff needs to be ready for the phenomenon and ready to change approaches. It also needs to be armed with formative evaluation to provide suggestions for more effective approaches: the kind of continuing monitoring of attitudes and lifestyle situations keynoted in Chapter Three and discussed in this chapter and in Chapter Six.

4.6.2 Communicating with the Public

The first step is to establish communication. It must be credible communication because the public is deluged with a

broad spectrum of sales and media publicity. The communications must also be conveyed through the correct channels at the right time to capture the imagination of the traveler and to awaken the possibility that ridesharing may be economical, convenient, and pleasurable. These channels may include the following:

- The media, television, radio, newspaper. Choose media carefully. Specific newspaper sections, television programs, and local magazines cater to specific audiences, and provide a good or bad context for your message. You are better off in a setting of unpleasant energy news than on the theatre page.
- Employers or their agents. Their approval can promote employee consideration of ridesharing. Their cooperation can provide a channel for (1) reaching employees, (2) providing strong incentives (e.g. preferential parking), (3) a basis for matching, and (4) support from the company personnel division.
- Word of mouth from family, friends. Years of research and experience confirm the extreme importance of personal sources for originating or validating attitude and behavior change.
- Other community sources (e.g., labor unions, civic associations). Such organizations provide excellent ways to reach homogeneous groups of commuters because the group identity and cooperative values have already been formed.
- Other government and private transportation agencies. They are frequently alert to various transportation audiences and may have channels for reaching them. Treat them as allies not as competitors. Your messages to the public should be compatible with theirs, not in conflict.

Over 85 percent of all RSAs have made some use of paid or donated public service announcements (PSAs) on television and radio, in addition to editorial, news, or special programming. This is generally a very expensive promotional technique, even if donated time is used, because broadcast material should be professionally prepared. The cost in 1979 dollars to prepare a 30-sec television program would be in the range of \$5000 to \$10,000 and a 30-sec radio program might run from \$1,500 to 5,000. Prepackaged PSAs may be available, but these should be evaluated to assure their appropriateness. It is often necessary to deliver each PSA personally to each station to ensure that it gets air time. The air time that they do get is seldom prime time and rarely even commuting time. Special programming, editorials, and news programs are far more desirable, but are generally hard to obtain except during transportation crises such as fuel shortages, bus strikes, and such. At such times, these opportunities should be exploited.

Substantial coverage in newspapers was gained by 80 percent of all areawide RSAs. This mostly included feature articles and editorials rather than advertisements. This is much less expensive than radio and TV marketing. Print media have some advantages. They are not time bound and will be encountered whenever the reader picks up the newspaper or other material. In addition, if they catch the readers interest, they can be borrowed or clipped and referred to later.

Another frequently used mass marketing approach is billboards (sometimes donated) and highway signs (usually posted by the highway department at cost). Where they have

been used, highway signs have proved to be an exceptionally cost-effective technique.

Other mass marketing methods have included bumper stickers; leaflets and information displays at banks, stores, and other public places; and mass mailings. These sometimes accompany utility bills or other noncommercial mass mailings. Finally, special promotional events have sometimes been staged, primarily for their value in getting news coverage.

In Section 4.2, methods were described for discovering what population subgroups, or market segments, might exist in a local community. For ridesharing promotion, two basic elements should be sought: (1) the characteristics and transportation needs of the subgroups, and (2) what media issues and messages attract and motivate each of the subgroups. This is crucial because the relatively homogeneous target groups characterizing a community become the targets for promotional campaigns. Since most population segments have specific locations, social structures, and communications systems—and since they frequently share media preferences—it is possible to focus the information and motivation campaign to each major segment. This is necessary because general appeals probably only provide assistance to those who already desire ridesharing. Focussing to particular market segments can be done by selecting the proper media, time, messages, tone and specific incentives (even at times, the kind of ridesharing) that will be most attractive to each. As more is learned about the problems, needs and preferences of population subgroups in a particular area, messages can be tuned more sensitively to them.

Different market segments, then, have different lifestyles. They may also listen more or tend to believe one source more than another. Some sources will be effective at gaining attention, while others will be more credible. Each target group is characterized by some configuration of information sources that is most effective for that group. Whatever they are, they should be heard at the right time, have great credibility, and be most convincing for that audience. See Appendix D for a summary of the target group findings of the 4-cities study.

4.6.3 Strategies for Promotion

4.6.3.1 Targeting Subgroups

On the basis of the disaggregations found by the methods described earlier, it is possible to select which population segments are most likely to respond to ridesharing campaigns and what kind of promotion campaign will suit them. To do so, one will have described each community segment, its values, practices, demography, and sociology. As noted, any RSA program will need to be sensitive to the different lifestyles in the particular community. Once one begins to know the community, its components and channels of communication, it is possible to proceed with several stages of promotion which can be on a more personal and less abstract basis than typical mass media approaches.

4.6.3.2 Increasing Awareness

This involves telling people that they have several optional modes for commuting, including ridesharing, and that each has its advantages and disadvantages. Emphasis on freedom of choice has always been attractive to the American people.

4.6.3.3 Ridesharing Promotion

Ridesharing promotion, to be successful, depends on ability to stimulate, in the commuter, the idea that ridesharing is a reasonable socially acceptable transportation option that can save money, minimize the work of driving, and provide safe, convenient commuting. This marketing of ridesharing is different from the conventional marketing of a commercial product. (In the latter it is generally assumed that the consumer wants the product (e.g., automobile, refrigerator, or breakfast food); the major effort is to obtain a greater market share for the specific manufacturer).

In “social marketing” (acceptance of innovation) as of ridesharing, the task is changing behavior, sometimes deeply ingrained behavior. To do so the RSA must know the population segments well and be perceived by them as serving their needs and preferences. This is the beginning of a personalized program for reaching, convincing, and serving local populations.

4.6.3.4 Strategies for Gaining Acceptance

Plan promotional programs based upon individual needs as well as the transportation and energy situation in the community.

Strategies are overall programs directed to convincing specific target populations to embrace ridesharing. Most include a public information phase, offering incentives, selection of channels of communication (employer, media, civic association), and use of active agents. Active agents might include: (1) home-end or work-end coordinators, (2) brokerage in which the agency itself is the agent, and (3) friendship links that are word-of-mouth connections in which successful ridesharers are the agents leading to ridesharing involvement. A matching system will also be needed that may be based on the use of computer or coordinators, or both, and demonstrates the effectiveness of the program in providing a congenial setting for the commute. By careful matching, it is possible to establish the kinds of quasi-homogeneous groups that require less adaptation to others on the part of the riders. Thus they will need less adjustment to get along with, or even enjoy, these people; and the carpool turns out to be a better and more stable relationship. A maintenance plan, which may be a booklet on successful carpooling or the availability of coordinators or a “hotline” to solve problems, may also be effective promotional elements, demonstrating the intent of the RSA to be of continuing service to the ridesharer after he has been placed in a group.

4.6.3.5 Timing

There are good and bad times to begin a ridesharing campaign; after a vacation or a job relocation period may be a good time. When an industry opens a new plant or a new shopping area is opened may be an excellent time. Fuel shortages and cutbacks in transit routes are others. Tax payment time or after Christmas when people are short of funds may be other times that heighten the need to conserve. A poor time would be just before vacation or just before Christmas when continuity will be broken or a high degree of mobility is needed for shopping.

Supplying information to the general public and to the specific targeted groups about ridesharing as a transportation option may employ themes appropriate to the motivation

of the targeted groups, and it may use the media or institutional involvement or other channels calculated to reach and be believed by the target population.

Develop a motivational aspect for the ridesharing program: this is essential to convert information about a program to the desire to participate in it. It is accomplished by offering various incentives both objective and subjective, institutional support, personal commitment, etc. In many cases skills are necessary to act upon the motivation.

4.6.3.6 *Commuter Skills*

In order for a potential ridesharer to get along well in the carpool group, he must understand and accept the interpersonal requirements. In short, he must be able to get along with people, to meet his obligation to them, and to communicate with them properly. The matching job is extremely important in many settings, but cannot be perfect. Incompatibility has been the downfall of many ridesharing programs. Informing new ridersharers about the best way to get along with others in a pool (pooling brochures) and good matching are the solutions.

Certain specific tactics are also important promotional features. These include familiarization (holding meetings of potential carpoolers, phone conferences, or other conferencing methods whereby people get to know each other); preparation and dissemination of films to appropriate target audiences; provision of incentives for new carpoolers (e.g., parking, access to fuel, perhaps at a good price); media efforts including television and radiothons; and other major efforts to develop a sense of community support for ridesharing.

4.6.3.7 *Orchestration of the Ridesharing Campaign*

It is essential that an overall examination of the program be made to assure that conflicting messages or competing themes do not cancel out the effects sought. If the campaign is made up of several phases, it will employ several media and address different messages to varying population segments. Many questions must be addressed. For example, should vanpool and carpool programs be undertaken separately or together? Should luxury services be advertised on mass media? The potential for dissonance and conflict should be evident. Such orchestration will reduce effort and expense required to undo or correct misunderstanding or confusion.

4.6.4 **Evaluation of the Promotion**

Formative evaluation of the entire ridesharing program is addressed in Section 6.6. Here those elements that relate to promoting ridesharing are emphasized. This is a feedback process in which the goal is to determine where and how successes have occurred, and where and why failures are occurring—both early on and in a continuing fashion during the life of the program and its promotional activities. By this process corrections can be made, and efforts and resources can be redirected as needed.

Sources of data for evaluating promotional efforts are (1) the coordinator of personalized ridesharing programs, (2) discussions with employers, (3) a ridesharing “hotline,” or (4) the types of small group and survey assessment methods discussed in Section 4.2. However, it will be advisable to obtain only limited information through data gathering meth-

ods for reasons of cost and user convenience. It is the task of the RSA director and staff to select carefully that information which will serve the purpose. Polling employers, employees, or the public excessively can force people away from ridesharing programs and exhaust necessary information sources. The best solution for this problem is probably to make two kinds of evaluation efforts: (1) informal discussions with key employers, coordinators, and a few selected employee and/or ridesharing groups; (2) embed evaluation items in formal data gathering efforts and used at wide intervals (perhaps yearly) to learn more about market segments and their ridesharing potential.

Several kinds of information will be needed to evaluate the promotional program; where possible, the subgroups or segments to whom the campaign was originally directed should be addressed.

- Is the public being reached with awareness of ridesharing? What was the channel employed?
- Are the target audiences being reached with awareness of ridesharing? What are the best channels?
- Do the target audiences comprehend the incentives? Which are most effective and what were the channels which reached the audience?
- Is the RSA changing the attitudes, being ignored, or eliciting negative attitudes or resistance? Has any interest been elicited?
- Is behavior changing? Are applications being submitted? Are people taking steps toward ridesharing? What are they?
- Is the behavior change effective and are people forming carpools?
- Do the pools survive? What are the criteria for survival?
- Is there turnover in the pools? How much? Do pools decay or turn over more in one kind of group than in other kinds of groups?
- What is the marketing cost of the pool, by segment, area, kind of pool, cost benefit, noting reduction in vehicle-miles traveled and vehicular trips? What is projected effect on ridesharing users cost?

4.7 **DEFINE DATA PROCESSING NEEDS**

Although the data processing needs of an RSA will evolve as it matures, it is wise to examine as many needs as possible at the beginning and plan for a smooth and orderly development process, free of crises. This section will not answer all data processing questions, but it will help to sort out the numerous considerations to permit an RSA to organize its thinking about its solutions.

4.7.1 **Develop a Data Processing Plan**

There are only a few required steps to develop a workable data processing plan. These are shown in Figure 4.

The first step is to decide, in some detail, what data processing is to be done (for example, carpool matching, accounting, etc.). After deciding whether to do this processing manually or by computer, the remaining steps then provide the important details.

4.7.2 **Choose Desired Functions**

The first step is to decide what data processing functions

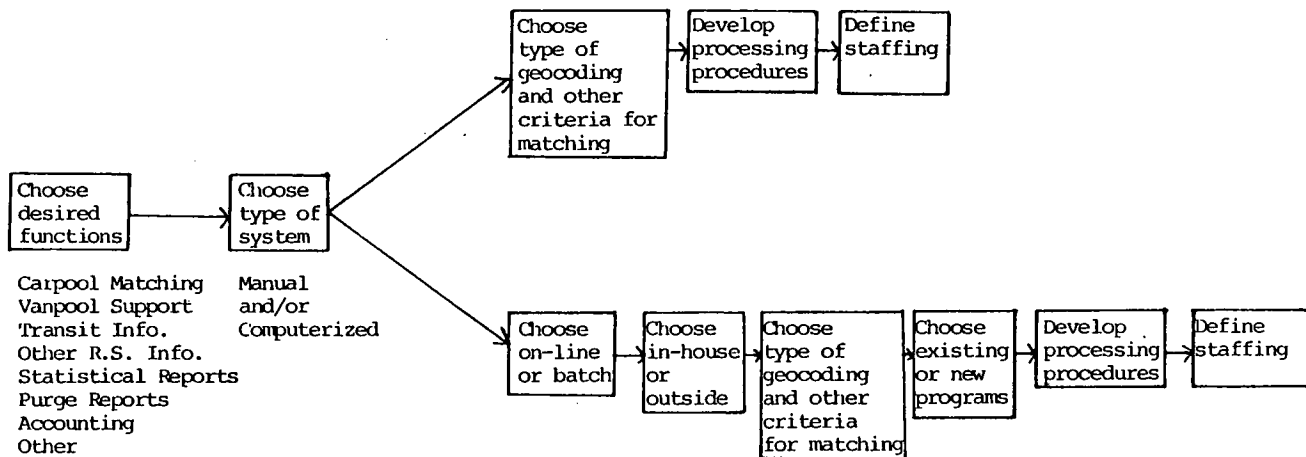


Figure 4. Steps to develop a data processing plan.

are needed based on the ridesharing services that the RSA will offer.

4.7.2.1 Carpool Matching

Carpool matching includes the basic time/origin/destination matching and printing of a match list. This is quite easy to do. Some additional features that are not so easy are often recognized as desirable (usually after some experience has been gained), which may include the following:

- Definition and coding of more personal and prescriptive criteria for coding (e.g. smoking, nonsmoking; strict timing or more relaxed, etc.).
- Extended search at home and work end.
- Route-to-work searching.
- Matching within-company only.
- Avoiding matching across geographic barriers (rivers, etc.).
- Accommodating flexible work hours.
- Printing "best" matches first.
- Sorting of match lists by Zip code or employer code.
- Automatically rematching those who got "poor" lists.

Not surprisingly, these features often come at a substantial cost; however, they may be essential to success. At the least they may avoid a second and third search after matching failure, if indeed the applicant comes back. A later section describes existing computer programs and the particular features that each offers.

4.7.2.2 Vanpool Support

Vanpool support can include vanpool planning features (to help establish new vanpools) and vanpool maintenance features. Vanpool planning features may include:

- Density matrices to identify clusters of commuters.
- Matching for personal preferences and social characteristics if included in the program objectives.

- Selected listings to identify those in each cluster.
- Mail labels, to send solicitations to each candidate or systematic telephone approach by coordinator of driver.

Vanpool maintenance features may include:

- Characterization of each pool (e.g., no smoking, one employer, etc.).
- Listings of riders on each van.
- History of travelers ridesharing experience as a guide to new placement if required.
- Current routing for each vanpool.
- Waiting lists for specific routes and vanpool characteristics if differences exist.
- Billing of third-party vanpool riders and accounting.

4.7.2.3 Transit Information

Transit information can be supplied to each commuter at three levels of quality (and cost):

- Level 1—This is the simplest and least costly level. It informs the commuter that transit service is available for his/her particular commute trip. The route number and name of the transit operator are usually included. The commuter usually must obtain further information before attempting the journey, and a telephone number or enclosed postcard to the transit operator is usually supplied. The Seattle RSA printout (not illustrated) is a good example of Level 1 transit information.

- Level 2—This level supplies more information than Level 1. Route names and numbers will be given along with some information describing where to board and alight (but not exact locations), plus some information about frequency of operation (but not exact times). If available, several routings will be shown, and the "to" and "from" trips are shown separately in case the service is different. Multiple-transfer trips can usually be handled. In most cases, this information will be sufficient for the commuter to attempt the journey. One example of Level 2 transit information system is con-

tained within FHWA's Commuter Information System (CIS), currently used by the Dallas RSA and others. This approach gives a moderate quality of information at moderate costs.

- **Level 3**—This supplies "complete" transit information to the commuter, including route number and name; exact locations and times for boarding, alighting, and transferring; and total travel time and fares for each of the several routings given. Further, unusual situations can usually be handled (for example: boarding restrictions, walking transfers, available buspools or vanpools, etc.) One example of Level 3 transit information is the PARIS (Passenger Routing Information System) currently being tested by the Southern California Rapid Transit System. This level gives excellent information at relatively high costs.

4.7.2.4 Other Ridesharing Information

This might include information to commuters about existing vanpools and buspools, taxipools (new or existing), park-and-ride or park-and-pool lots, preferential-treatment roadways, etc.

Other listings would be for internal use within the RSA, and might include: alphabetical master lists of names on file; ID numbered master lists of names on file; geographical master lists; purge lists for updating old data.

4.7.2.5 Statistical Reports

These are also for internal use, and may include: numbers of people on file by city, county, company, etc.; numbers of transactions for each batch processed; numbers of "good" and "bad" match-lists produced; and employer statistics (e.g., for EPA regulations). Comparative study of these lists provides useful feedback.

4.7.2.6 Purge Reports

Purge procedures used for keeping data files up to date include: listings identifying "old" data; personalized letters or calls to these "old" people on file; mail labels for all "old" names on file; automatic (or semi-automatic) deletion of old data.

4.7.2.7 Accounting

Accounting usually includes: accounts payable; accounts receivable (e.g., for third-party vanpools); billing; payroll; general ledger.

4.7.2.8 Other

This "miscellaneous" category perhaps includes (1) matching success, operations, and marketing analysis procedures, and (2) statistical analysis procedures for evaluations.

It should be clear by now that there are a number of data processing choices to be made; and none of the options are free (few are even cheap). One responsive strategy is to define a basic set of necessary data processing functions to be performed at the outset and a time-phased plan for adding new functions that are likely to be cost beneficial. Data processing for its own sake is counterproductive. Require the vendor or operator to explain and justify each addition. Delays due to computer breakdown can be costly in dollars and

time. So long as there is a well thought out development plan, this incremental approach will probably be much less costly than trying for everything at once. It could prevent the RSA from getting hurt by a computer programming project that overruns budget and schedule. It leaves more flexibility to provide for changing circumstances, and change is the only constant at most RSAs. Therefore, the incremental approach to data processing development is highly recommended.

4.7.3 Choose Type of System

The main choice to be made at this step is whether the data processing functions previously identified should be done manually, by computer, or by some combination of each. Predominant considerations in this decision include the following:

- **Size of data base**—Manual data processing is quite feasible for RSAs with data bases of up to 10,000 or so applicants (Public Service Options of Minneapolis is a good example). The break-even point is probably somewhere in the range of 5,000 to 10,000, depending upon the next factors.

- **Number of functions performed**—If only one function is to be performed, say basic carpool matching, it is likely that manual processing can be cost-effective for even large data bases (at least 10,000). If several functions are to be performed, and especially if staff availability and response time are limited, some computerization is appropriate even with relatively small data files (perhaps as small as 2,000).

- It is vital that the limits of data processing itself do not prevent performance of vital RSA functions. Some kinds of information cannot be categorized or retrieved without loss of meaning. Thus, in smaller files, a coordinator with some basic information may be able to provide better matches than a computer. In others, a combination of data processing supplying information for use by a coordinator may be the ideal solution.

- **Availability of computer support**—If good computer personnel and adequate computer time are not completely assured, computerization should unquestionably be deferred until the latest feasible time. If there is to be computer support, it is essential that it be stable.

Another consideration may become salient over time. One study revealed sharp distrust among some consumers of putting into a computer information about one's address plus departure time to and from work (4). It appeared to be based on the knowledge that computer systems are vulnerable to penetration, the known rising crime rate in the area studied, and public broadcast of police department warnings against publicizing absences from home. Whether this type of computer distrust will spread widely among consumers is not yet known.

4.7.3.1 Manual Data Processing

If manual data processing is chosen, the steps are as follows:

1. **Choose type of geocoding**—"Geocoding" is the process of assigning a geographic location to each person's origin and destination, so that commuters with similar travel pat-

terns can be matched. With manual processing, geocoding can be done by Zip code, telephone prefix, or map squares. The latter may require that the RSA print a special map with a grid overlay that divides the region into "map squares."

Local circumstances will dictate the proper choice, of course, but there are several general considerations here. Geocoding areas should not be too big, or poor matching will result. Similarly, they should not be too small, or too many empty match lists will result. Zip codes and phone prefixes will vary in size according to population density, which is good; but they are also irregularly shaped and subject to change, which is bad. Furthermore, one Zip code can include vastly dissimilar social classes which for carpooling is especially lethal.

Regardless of geocoding method chosen, the data file should be kept in specific order: ascending order of origin code within each destination code, which is also in ascending order.

2. Develop processing procedures—This step requires the development of a fairly detailed description of each of the manual processes that must be performed. Particular thought must be given to the amount of time that each step will take (say, per transaction), and the level of skill that will be required.

A number of techniques are available, some so simple as to require only punched edge cards and a hat pin (McBee Sort). Most cities have office equipment companies that can demonstrate manual systems with a range of capabilities. The number that can be processed will, of course, be limited as previously noted.

3. Define staffing requirements—With the processing requirements developed, the estimated transaction quantities (from Section 4.2) can be used to calculate the number of people required and their skill levels. This will, in turn, permit a labor budget and, in large organizations, an organization chart to be developed for the data processing functions.

4.7.3.2 Computerized Data Processing

Computerization should only be used when necessary and when it is cost beneficial. Care should be taken to assure that there is no significant loss of sensitivity in matching. The steps are as follows:

1. Choose on-line or batch processing—One serious caveat is security. Although this problem has not yet affected most RSAs, security and privacy of data are big issues in other computer applications. With on-line service, a person with criminal intent could obtain information from the data files while leaving no tracks. A batch system requires, at least, a valid address where the applicant can receive the match list. Note that consumers are extremely wary of having computer information about their times of departure and arrival lead to robbery of their homes. This was true in 1975 (4) and remained true in 1980 (3). Furthermore, "sunshine" and freedom of information laws make these systems vulnerable to the media, as well as others—a different concern which leaves the consumer no happier.

The safest course is to begin with a batch system and move to an on-line system only after considerable experience has been gained, and inasmuch as it is really needed.

2. Choose in-house computer or outside processing—The purchase and maintenance of an in-house dedicated compu-

ter is a substantial commitment that should be made only by mature and stable RSAs, and only if excellent computer personnel are available. The pros and cons of an in-house computer (compared to outside processing on someone else's computer) are:

- a. *Pro*: Great autonomy—An in-house machine is totally under the control of the RSA, and all competing priorities are determined internally. If the outside computer time is being donated by a government agency, for example, it is very common for computer time to become tight or even nonexistent at the end of the fiscal year. Although it is much less common, even commercial service bureaus can get caught in a priority squeeze occasionally.
- b. *Con*: Greater responsibility—Once the computer is in-house, the RSA assumes a number of problems that were invisible with outside processing. These include: computer maintenance (hardware and some software), dealing with emergencies (malfunctions, power failures, etc.), data security (from external and internal threats), and concerns about technological obsolescence.

For those RSAs who obtain free or cheap computer support, an in-house computer will dramatically increase data processing costs. For RSAs who pay the true costs of their computer support, the cost issue must be decided by careful examination of specifics.

3. Choose type of geocoding—Computerized processing offers a much greater range of choice among types of geocoding. As with manual processing, Zip codes, telephone prefixes, and map squares are possibilities. In addition, the computer can also be used to translate addresses into geographic locators such as census tract, traffic analysis zones, voter precincts, nearest intersection, or other geographic areas as may be used by the local utility companies, for example. Developing an automatic (computerized) geocoding process from scratch is a very large undertaking—too large for most RSAs. It is far better to seek out some local organization that is already doing computerized geocoding and adapt its programs and procedures to RSA needs. Such opportunities will almost always be available, although perhaps not obvious.

4. Choose existing or new programs—Regardless of whether processing is to be done inhouse or outside, on-line or batch, the RSA should first attempt to find an existing package of software (and hardware if inhouse) that will perform the desired functions. There are a number of good packages available; these are given in Table 15, along with the major functions that they perform.

If none of the existing packages can reasonably meet local data processing needs, the next course of action is to estimate the costs for modifying an existing package. If an existing package comes close to satisfying the local needs, this will generally be the most cost-effective path. Only if there are major differences between existing package capabilities and local needs should the RSA undertake the development of new programs. Even then, it should only be done if competent computer support is available, and it should be done incrementally.

5. Develop processing procedures—This step requires the development of a fairly detailed description of each processing step—manual or computerized—that must be performed. If any programming is to be done, this definition of

Table 15. Computer packages available.*

Packages:	Functions Performed						Other Information			
	Automatic Geocoding	Carpool Matching	Vanpool Support	Transit Information	Accounting Support	Other Listings	Batch or On-Line	Computer Required	Contact for more information	
FHWA "Carpool" Program	No	Yes	Some	No	No	Few	Batch	IBM 360	Bob Redmond	(202) 426-0210
Bureau of Census "Carpool" Program	Uses Admatch	Yes	No	No	No	No	Batch	IBM 360	Bureau of Census, Washington, D.C.	
ADMATCH/UNIMATCH/DIME	Yes	No	No	No	No	No	Batch	IBM 360	Bureau of Census, Washington, D.C.	
FHWA "C.I.S." (Computer Info. System)	Optional	Yes	Yes	Level 2**	No	Many	Batch	IBM 360 (Others?)	Bob Redmond	(202) 426-0210
Comsis Rideshare System	Uses UNIMATCH	Yes	Yes	Level 2.5	No	Many	Batch	IBM 360	George Bonna	(412) 343-5665
Colorado Springs System	?	Yes	No	No	No	?	On-Line	PDP-11	Judy Evans	(303) 471-7665
Knoxville System	No	Yes	Yes	Level 1	No	?	On-Line	Phoenix	John Beeson	(615) 637-RIDE
Houston System	Yes	Yes	No	No	No	?	On-Line	Datapoint	John Witson	(713) 780-4443
San Francisco System	By Landmarks	Yes	Some	Level 1	No	?	On-Line	HP-300	Russ Bradford	(714) 495-5246
Little Rock System	No	Yes	No	No	No	?	On-Line	TI-99/4	Mike Waller	(501) 372-3300
P.A.R.I.S. (Systems Devel. Corp.)	Yes	No	No	Level 3	No	?	On-Line	Various	Roy Gates	(213) 820-4111
Palo Alto Assoc. System	Admatch + Landmarks	No	No	Level 3	No	?	On-Line	IBM 360	Hugh DiGiulio	(415) 321-3123
Systems Consultants Inc.	Yes	No	No	Level 3	No	?	On-Line	?	Jay Hargrove	(202) 342-4000

* As of October 1981.

** Availability uncertain as of October 1981.

each computerized processing step (if carefully done) can serve as a specification to the programmer. This will help minimize the all too common misunderstandings between programmer and user and will also provide a basis for acceptance tests of the delivered product.

6. Define staffing requirements—The final step is to use estimated transaction quantities (see, for example, Section 4.2) to specify the number of people required and their skill levels, then to make up a labor budget and organization chart for the data processing functions. If any programming is to be done, these specifications can be used to get estimates from the programmers for budgeting purposes.

4.8 PLANNING FOR COMMUNITY TRANSPORTATION EMERGENCIES

■ Planning for transportation emergencies should not be viewed as “contingency planning.” It is quite clear that these emergencies will occur. The only uncertainty is “when?” Transportation emergencies can take a number of forms, varying widely in terms of advance notice, magnitude, duration and location, and segments of the commuter population affected. RSA responses can also vary widely. ■

This section outlines the categories of transportation emergencies and then describes responses that may be planned for each.

4.8.1 Types of Transportation Emergencies

There are four major categories of transportation emergencies:

1. Transit strikes.
2. Localized traffic disruptions.
3. Air pollution episodes.
4. Fuel shortages.

Each category has unique characteristics that require different response plans.

4.8.1.1 Transit Strikes

Transit strikes are usually foreseeable at least several weeks in advance. In most urban areas, they will affect only 10 to 20 percent of the commuters, but many of these people will be transit captives with no automobile available to them. Most of these strikes will last only a few weeks. The demand for RSA services will exhibit a large jump, usually on the day the strike begins. Most of this demand will come via the telephone and the need for assistance will be immediate, especially for the transit captives.

4.8.1.2 Traffic Disruptions

These transportation emergencies are usually geographically localized, for example: a major bridge or tunnel closure, a major freeway closure or capacity reduction, a commuter rail or rapid transit line closure. These traffic disruptions can be either unforeseen and short (typically one or two days long) or very predictable and very long (e.g., rebuilding a bridge). The demand for RSA services will probably be affected only by the long disruptions. This demand may

materialize via telephone or through employers. The predictability of the long disruptions makes them easier to plan for, but it is possible to encounter a long and unpredictable traffic disruption (e.g., a barge colliding with a bridge and causing its closing).

4.8.1.3 Air Pollution Episodes

Several urban areas throughout the country are subject to occasional air pollution episodes severe enough to warrant major reductions in automobile use. These emergencies are usually declared by the local air pollution agency on the afternoon before the day on which the emergency plan must go into effect. These episodes are usually only a few days long, so RSA demand is not noticeably affected on a per emergency basis, although RSAs can plan recurring emergency services for such areas.

4.8.1.4 Fuel Shortages

This is the transportation emergency of most concern to travelers, although the actual likelihood is probably not greater than that of other emergencies. The point is that its salience is high for the U.S. population which feels manipulated, angry, and helpless in the face of fuel shortages. For planning purposes, it is necessary to envision at least three fuel shortage scenarios:

1. Mild shortage, short duration—This might be caused by local refinery disruptions or allocation problems, resulting in mild gas station queuing lasting perhaps several weeks, as happened in 1979. This type of emergency may not be predictable. It usually has small effect on RSA demand levels.

2. Mild shortage, long duration—This might be caused by an oil embargo by one OPEC country or any other limited interruption of oil production over a long time period. The onset of such shortages is usually foreseeable a few months ahead. RSA demand would probably increase slowly in response to mild but prolonged gas station queuing and gasoline price increases.

3. Major shortage, unknown duration—The probable cause of a major fuel shortage would be an embargo by all (or most) of the OPEC countries, in which case the duration would be unknown (but probably at least a few months). This shortage would manifest itself in terms of severe gas station queuing, and some sort of rationing plan would probably be imposed after a while. As was the case in 1974, the actual shortage would not begin for several months after the embargo began because of oil shipments en route and domestic stockpiles. Thus, the RSA will have at least one month to implement emergency measures before demand for services begin to rise sharply.

In all of the foregoing fuel shortage scenarios, all automobile users will be affected. Because nonwork trips are more easily foregone than work trips, the commuter (and especially the long-distance commuter) bears the brunt. In all of the fuel shortage cases, the actual need by commuters for RSA response is not immediate (although a harried driver waiting in a gas line would certainly disagree)—however, the RSA opportunity to promote ridesharing is. To summarize, the different types of transportation emergencies have dif-

ferent attributes with respect to amount of advance notice, magnitude and duration of demand for RSA services, segments of commuter population affected and immediacy of their need for assistance, and RSA opportunity to promote both emergency and long-term ridesharing.

The next step is to examine the different courses of action that may be appropriate for each type of transportation emergency.

4.8.2 Types of Response Plans

In general, there are three levels of action that may be taken to developing a realistic response capability:

1. Working within the RSA only to develop the capability to respond in a timely fashion to increased demand and wind-fall opportunity.
2. Working with major employers to help make the employer self-sufficient in case of transportation emergencies.
3. Working with all parties in the metropolitan area to develop a comprehensive, areawide plan. This includes all relevant government agencies and all transportation providers.

It is clear that these approaches are listed in order of increasing benefits and increasing complexity. An RSA must decide what levels of intervention are appropriate and to what degree. Approach 1 should receive first attention because 2 and 3 are not possible without it.

4.8.2.1 Approach 1—Working Within the RSA Only

This approach assumes that the RSA will continue to offer its standard services, but for an increased demand level. A logical first question to ask here is: What will the demand level be? It is difficult to make numerical predictions, although the patterns of demand are predictable. Demand levels will be related to the severity of the crisis, of course. During the fuel shortage of 1979, for example, RSAs experienced increases of demand varying from threefold to twentyfold.

A realistic question to ask is: What demand levels can this RSA afford to meet (within the existing budget and within an augmented budget)? This is another way of asking: For what level of preparedness are the funders willing to pay? That approach is the wisest politically. It includes estimating the costs for several different levels of preparedness and working with funders to determine what makes the most sense for the RSA and the community. The measures to consider are:

1. Staff expansion—hiring and training new personnel. For the more difficult jobs, there may be insufficient time for adequate training (especially for transit strikes and unanticipated traffic disruptions).
2. Space expansion—a rule-of-thumb for this is 100 sq ft per person.
3. Telephone expansion—any new phones, of course, should be on a rotary with your current phone number.
4. Longer service hours—possibly including evenings and weekends (an alternative might be an answering machine or service).
5. Extra supplies—it is, in any case, desirable to maintain an extra amount of any long-lead items.

6. Data processing—verify that any additional computer requirements can be met (e.g., computer time, keypunching, etc.).

7. Publicity—prepare press releases, posters, newspaper ads or articles, etc. in advance. Identify communications media and other outreach channels (banks, post offices, etc.) ahead of time.

8. Crisis identification and monitoring—Who will decide when to implement any or all of the emergency measures? What information must be available? When is the emergency over? Who is responsible for special emergency activities?

An unusual suggestion for handling the first three items was made by Commuter Computer of San Diego—they suggest finding a local organization (public or private) willing to make available staff, space, and phones during an emergency. Some pretraining of staff might be needed and a new telephone number would have to be publicized as an emergency number.

It may be wise to consider modifying the services offered during emergencies. For example, if the RSA's standard service is carpool matching and the crisis will be severe enough to overwhelm normal processing capability, attempts to expand the standard service to all will result in growing backlogs producing poor turnaround and dissatisfied customers. One alternative might be to distribute "do-it-yourself carpool kits" containing instructions and materials (e.g., bulletin board signs) that enable commuters to become more self-sufficient in solving their own transportation problems. Of course, such kits must be prepared in advance of any crisis.

Recognize also that the people applying for ridesharing services during an emergency include many who would not be interested during normal times. This has many implications. These "crisis applicants" should be identified so that they can be recorded in a "crisis bank" for use only during crises. Here the opportunity also exists to use this bank for later outreach services. Would the applicant like to transfer to regular ridesharing? To "winter only" ridesharing where the climate suggests that? To stay on the crisis roles? An RSA must also be careful about expanding vanpool and bus-pool programs too rapidly during a crisis. This can obviously lead to a catastrophe if the attrition rate is too high after the crisis is over.

4.8.2.2 Approach 2—Working with Major Employers

This approach assumes that the RSA uses employer-based marketing and has a good working relationship with a substantial number of employers, as is the case for most RSAs. Three emergency preparation measures are possible under this approach: the "advanced matching" technique, the employer "do-it-yourself" technique, and the employer workshops:

1. Advanced matching—Some RSAs require that all persons working for an employer fill out an application form, including one or more questions to identify those who are interested in regular ridesharing. For those who are, match lists are prepared and distributed, including only the names of other regular ridesharers. For those who are not, "emergency match lists" are prepared, including all reasonable matches regardless of interest. These match lists are also distributed, along with instructions that they be kept avail-

able in case of emergencies. These “emergencies” can also be described to include personal emergencies, such as an automobile breakdown. To keep the information on these emergency match lists current, the advanced-matching technique requires the same kind of update and rematching procedure to be performed at least once per year.

This technique is especially applicable for emergencies where the notice is short and the need is immediate, such as transit strikes, air pollution episodes, and traffic disruptions. It also creates a positive image with employees of both employer and ridesharing—both clearly interested in the commuter’s well being and desires.

2. Employer do-it-yourself technique—This technique requires that the RSA supply all employers with instructions and materials enabling them to establish and operate an in-house, emergency ridesharing center. Most commonly, these would use manual matching systems such as the “grid map and pigeonhole” method or the McBee Sort (see Section 6.5 for more details). Advance preparation is also necessary here, including the development, production, and stockpiling of all necessary materials. Some preselection of emergency ridesharing staff and their pretraining are also required if the service is to have any hope of functioning adequately.

3. Employer workshops—If an RSA normally uses employer-oriented marketing, with contacts being made individually with each employer to promote the program and explain procedures, it will find that most transportation emergencies will quickly generate a large backlog of employers requesting service. Under such circumstances, the RSA may wish to temporarily drop the one-to-one approach and adopt a one-to-many approach. This could be done by assembling the employer representatives into groups of 10 to 30 and making presentations describing services and procedures. Obviously, these employer workshops also require advance preparation—all emergency preparedness does. Several RSAs are now also developing these employer workshops for use during nonemergency conditions.

4.8.2.3 Approach 3—Working with All Parties in the Area

This approach assumes that the RSA will be a participant in the development of a comprehensive, areawide, emergency transportation plan, including all relevant governmental agencies and all transportation providers. This work is clearly the most difficult and time consuming of the three. If well done, however, it is likely to offer the greatest results when the crisis arrives.

The following section is written from the perspective of the organization that takes the lead role in the emergency planning process, whether that be the RSA or another party. For sake of efficiency, one organization should be responsible for developing and updating the plan, plus implementing it when the emergency arrives. Because the MPO is usually responsible for the implementation of EPA and DOT transportation planning requirements, the MPO may be a logical choice for the lead organization. The following is an outline of necessary steps:

1. Define players and roles—Identify all relevant parties in the area. These may include:

- Public transit operators.
- The RSA.

- Other transportation providers (charter bus, dial-a-ride, jitney operators, taxicab companies, social service agencies, school bus operators, etc.).

- Governments—state, regional, county, cities; including regulatory commissions.

- Major employers (perhaps through the Chamber of Commerce or Board of Trade).

- Major labor unions.

- Major fuel suppliers.

- Major public media.

Some definition should be made of the role that each party will be expected to play, although this will be obvious in many cases.

2. Organize the plan—Communicate with all of the relevant parties, working out with them:

- Specific role and level of involvement.
- A sequence of planning activities (meeting, milestones).
- Products, i.e., an action plan.

(Also, secure the necessary space and clerical resources to support the planning process.)

3. Analyze supply and demand situations—An earlier section presented some possible emergency scenarios, as characterized by: amount of advanced warning, magnitude and duration of demand, and segments of commuter population affected. It is most useful to attempt to quantify these magnitudes and durations of demand, using all available information. Although this cannot be a precise calculation and must include a good deal of educated guesswork, demand estimates will be essential for planning.

Concurrent with developing demand strategies, the “planning group” should also perform an inventory of transportation services that could be available during an emergency. This of course includes currently available services (transit, taxi, etc.) and, in addition, services that would require some social adjustments. Examples are suspending regulations that prohibit shared-ride taxis or jiteys; adjusting school hours so that school buses can be used to serve the morning-commute peak period; emergency staggered hours for major employers in the area. This inventory should also include available capacity, service restrictions (e.g., handicapped), costs, legal or institutional restrictions, geographic constraints (e.g., a rail line), advanced notice requirements, secondary effects (e.g., insurance requirements for private jiteys).

4. Develop action plan(s)—Given the radically divergent characteristics of the possible emergency scenarios, an RSA will probably elect to develop several action plans to accommodate the variety. It is essential to begin by setting objectives, although they are likely to need some changes as experience indicates. Each scenario specifies a demand pattern. Will an attempt be made to satisfy 100 percent of the new demand for transportation? At what level of service, in terms of crowding, delays, congestion, etc.? Will the focus be on commute trips only, or on all trips?

Knowing the likely demand patterns, the objectives for satisfying them, and the potential transportation resources available, an RSA can then develop a set of strategies and tactics for each scenario. For example:

Scenario: Mild fuel shortage, short duration

- Strategies:** A. Use existing excess transit capacity
 B. Permit shared-ride taxi operation
 C. Promote carpooling
- Tactics:** A-1. Prepare for large-scale distribution of route and schedule information.
 A-2. Maintain readiness of transit fleet.
 B-1. Obtain advance approval from PUC for shared-ride taxi operation during emergency.
 B-2. Develop education program for taxi drivers.
 C-1. Develop plans at specific employment sites for emergency carpooling.
 C-2. Develop public information campaign to promote carpooling during emergencies.
 C-3. Augment capacity of the RSA to handle increased demand for matching services.

Each tactic would then be broken down into a set of specific action items for which one party would be responsible and for which a time and cost estimate would be developed.

When considering specific actions for possible inclusion in the plan, each affected party could usefully consider the following factors (60).

- Whether the action can be taken unilaterally or whether it requires the participation of other organizations.
- Under what circumstances (what stages of what scenarios) the action should be implemented.
- The fuel demand reduction or trip capacity increase that will result.
- The lead time that will be required to implement the action.
- The financial and other resources that will be required.
- The political, social, institutional, and economic impacts.
- Whether actions that are taken by other organizations can help promote success. For example, employer introduction of regular variable-work-hour programs could help spread the peak hours of travel on transit.

5. Making advance preparations—The Emergency Action Plan will contain many activities that cannot wait until a specific emergency looms. Time and money will need to be allocated and expended by most of the participating parties

in implementing the advanced-preparation requirements for any plan—otherwise the response will be too little and too late. The lead organization can be responsible for monitoring and urging advanced preparation by all parties.

6. Updating plans—As circumstances change, the plan should be updated to compensate. Emergency planning groups might meet once a year to reevaluate in the light of changing community, economic, and transportation circumstances.

7. Implementing emergency actions during the emergency—An important item for any plan is a “triggering mechanism” that identifies what circumstances will cause all parties to implement a total plan or relevant parts. One organization would normally have the responsibility to declare the emergency, although this duty may be divided according to scenario when appropriate.

When possible, communications should be established ahead with state and federal agencies to supply advanced notice of their actions—for example, the imposition of gas rationing. Another element of the emergency plan will be monitoring emergency activities. This is obviously needed to manage these activities. However, it will also be useful for later evaluation. It will not only help satisfy questions that can be expected from the media, but will help to turn their interest into a good promotion for ridesharing. The necessarily frequent reporting schedule will be at least daily (and perhaps hourly under critical circumstances). The RSA will therefore have predetermined in its plan the key indicators to monitor and report.

8. Evaluating emergency actions—Because experience is the best teacher, much will be learned from the first transportation emergency. The RSA can expect to gain valuable insight about the response of local commuters, its own, and other participating organizations. Ideally, each organization evaluates itself with the lead agency studying the coordination between parties. In the normal course of events, all participants can expect to produce ideas to improve the emergency action plan—for with such a collaborative, formative approach and solidarity of purpose the crisis will tend to unify the various participants, and better prepare them for the next transportation emergency.

CHAPTER FIVE

IMPLEMENTING THE RIDESHARING PROGRAM

■ Existing ridesharing agencies may want to skip parts of this chapter. It concerns making and executing an implementation plan to bring a new RSA into operation. However, an existing RSA thinking about expanding or offering new services will

find some of the steps useful to review. They are: (1) prepare implementation plan, schedule, and budget; (2) establish organization and business management; (3) hire and train staff; and (4) initiate operating functions. ■

5.1 PREPARE IMPLEMENTATION PLAN, SCHEDULE, AND BUDGET

5.1.1 Implementation Plan and Schedule Guidelines

The planner of a new RSA needs to think through all the steps involved in bringing the RSA into operation. Typical general steps, assuming that interim or first-year funding has already been secured, will be:

- Outline the objectives of the program and the functions needed to implement it.
- Set up the organization and the business management function.
- Start accounting and personnel procedures.
- Outline ridesharing procedures and develop supporting forms.
- Launch the promotion program on either a large or small scale, depending on available resources, opportunities, and the readiness achieved during the planning stage.

This will be a more involved process for an RSA organizing as an independent entity than for an RSA organized as part of an existing agency. The independent RSA must start from scratch, whereas the other has existing accounting, budgeting, personnel, and similar services with which it has only to set up liaison. In either case, there are lead times required and critical paths that set the schedule and sequence of some activities.

To mention several examples, a private sector RSA must incorporate before it can apply for nonprofit status. A request for bids must be prepared and sent out before a leasing company can be selected for vans. Employers must be contacted and given time to respond before employee promotion can begin; this is an important step for implementation if there is not to be a long lag between the beginning of operations and having vans on the road or carpools forming. To aid in planning these steps, a PERT chart is useful to show the critical paths and the sequence of activities.

Several other general principles should also be followed in planning the implementation. To avoid staff overload, all steps cannot be initiated simultaneously. Major activities can either be phased or started on a small scale. For example, RIDES for Bay Area Commuters waited 6 months after starting its areawide vanpooling program to take over an ongoing carpooling program from Caltrans. This phasing ensured a smooth transition for the RSA, whereas assuming the carpooling program initially would have meant starting with twice the original staff and twice the startup problems. After more than a year of operation, RIDES approached its next step in this phased growth: offering buspool services.

Alternatively, an RSA may start more services on a small basis. That is, carpool and vanpool services may be offered to only a small number of target groups. One RSA that started big, with areawide employer and public solicitations, now thinks that it would have been much better off to have started small, with a geographical concentration of effort, for two important reasons: (1) *implementing problems could have been worked out carefully as they arose rather than having to be treated as emergencies requiring quick resolution and;* (2) *more applicants could have been matched than was true for the dispersed applications received from an*

initial areawide program. An additional factor favoring the small start is the ability to select first those organizations—employers, activity centers, or neighborhood agencies—who are more responsive to ridesharing. The resulting success stories can be used later as examples and leverage with others, thus initiating a “bandwagon” effect. Furthermore, the costs of any computerized data processing can be postponed.

Related to the principle of starting small is the principle of “Get your act together before going out on the street.” That is, necessary forms and procedures should be worked out before offering ridesharing services. Driver agreements, employer agreements, application forms, accounting forms, and the like should be developed before the RSA goes into operation. The same applies to responses to questions such as: What do we do if a driver lies about his driving record? What do we say if an employer wants to know about the possibility of labor making a ridesharing program a fringe benefit? It is clear that experience will produce some modifications. A careful log or record of such experience should be maintained and distributed to key personnel to assure the availability of information and policy change to the staff.

A key word in implementation is borrow. Other RSAs will probably be glad to share procedures and forms that are applicable. This can cut start-up time dramatically. With forms and procedures from RIDES in San Francisco, Caravans of Masspool in Boston was able to implement its vanpool program in only 4 months instead of the 8 months that it took RIDES. A small selection of such forms is included in Appendix C of this report, but new RSAs are encouraged to obtain up-to-date versions of them from one or more established ridesharing agencies, such as those cited in this manual. There is also some further discussion of which agencies employ what kind of forms and procedures in Chapter Six.

Another key word in choosing a schedule is balance—balance between action that produces results and planning that makes the action coherent and credible. There will be considerable pressure on you to produce results, to get the first van on the street, to match the first carpools. Getting the first van or carpools out will also give the staff a great boost in morale at seeing some results. However, the timing of this action must be balanced by considering the credibility gained by having procedures that make sense and a staff that can answer questions that will arise. Details such as driver lease agreements, scheduling problems, or an influx of demand can paralyze an RSA that is not ready. Table B-7 in Appendix B summarizes information from 10 RSAs on their start-up time and costs that may be useful in planning the start-up of an RSA. Recommendations on operating policies, techniques, and incentives are also included.

Table 16 outlines the sequence of implementation tasks followed by RIDES. The order of the tasks reflects many of the guidelines in the previous section. For example, contacting and organizing initial clients leads the list of tasks to give ample lead time for response before operations begin. The budget and a grant proposal also come early in the list because they are groundwork for any subsequent actions. Incorporating is a task spread out in steps over the first half of the list. Arranging for office space and a van provider takes up much of the last half of the list.

Table 17 outlines the agenda for the organizational meeting

Table 16. Example of implementation tasks (RIDES for Bay Area Commuters, Inc.).

Contact and organize initial clients
Design work program
Draft articles of incorporation
Establish and approve budget
Preliminary grant proposal to state energy commission
Submit formal proposal
Approve and file articles of incorporation
Prepare bid specifications for van leasing company
Approve formal proposal
Establish board of directors
Hire preliminary staff
Recommend office facilities
Incorporation
Approve request for proposal (RFP)
Approve corporate work program
Sign leasing agreement for office space
Send out van leasing RFP to potential bidders
Advertise RFP in local papers
Prebid conference
FEA vanpool workshops
Secure funding
Begin carpool operations
Van leasing bids due
Select van leasing firm
Submit proposed guidelines for operations
Sign agreement with van leasing firm

Table 17. Sample agenda for organizational meeting of the Board of Directors (RIDES for Bay Area Commuters, Inc.).

1. Introductions
2. Election of temporary Chairman and Secretary
3. Election of Board of Directors
4. Confirmation of filing of the Articles of Incorporation
5. Adoption of Bylaws
6. Adoption of Corporate seal
7. Authorization to sign contracts, accept monies, and establish accounts
8. Adopt fiscal year
9. Establishment of various committees and duties
a. Technical Advisory Committee (T.A.C.)
b. Personnel Search Committee
10. Report on office facilities by Consultant
11. Authorize payment of organizational and other related expenses of forming corporation
12. Other matters
13. Adjournment

of the board of directors of RIDES. A similar initial list will be necessary for any other RSA that is incorporating.

These two tables are, of course, only examples and not all-inclusive lists. The proper procedure for the RSA planner is to think through a corresponding list of initial tasks appropriate for the services to be offered and then take local variables into account. A time table should then be attached based on the experience of other RSAs with whom the planner(s) should be in touch.

5.1.2 Budget Guidelines

As with the implementation plan and schedule, the key to success is thinking out what expenditures will be required to carry the RSA through implementation and its initial period of operation. These initial estimates can be compared with the actual expenditures to improve the RSA budgeting process. Two basic rules of thumb apply here: to estimate expenditures realistically and to stay within the overall funding limits.

Table 18 presents the first year budget and the first 6 months of expenditures ("Totals to Date") for RIDES. The categories and percentages should receive more attention than the dollar amounts. Inflation alone will have changed most dollar amounts by 30 percent or more in 2 or 3 years. Note that categories with percentages around 50 percent, like salaries, were right on schedule for being halfway through the year. Such other items as office space and equipment were obviously much more expensive than anticipated. On the other hand, vehicle leasing and media advertising had barely begun.

Table 18. Example of budget vs. expenditures through the first 6 months (RIDES for Bay Area Commuters, Inc., 1978).

	Totals to Date (6 months)	Amount Budgeted for 12 months	Percent
	(\$)	(\$)	
SALARIES (GROSS)	29,096.18	61,650.	45.9
EMPLOYEE BENEFITS	2,591.16	15,400.	16.8
OFFICE SPACE	8,417.16	8,000.	105.0
MEDIA	1,690.93	6,000.	28.1
TRAVEL	1,558.90	2,200.	70.8
VEHICLE LEASING	460.70	10,000.	4.6
DEMONSTRATION VEHICLE	794.73	1,000.	79.7
OPERATING COSTS	217.53	1,700.	12.7
FLOORING PAYMENTS	-	3,700.	-
CONSULTING SERVICES	1,818.05	12,000.	15.1
PRINTING	2,730.47	4,000.	68.2
OFFICE EQUIP./SUPPLIES	12,584.19	12,000.	104.8
MISCELLANEOUS	3,000.00	5,000.	60.0
TOTAL INVOICED AMOUNTS ON CURRENT CONTRACT	64,960.00	142,650.	46.0

5.2 ESTABLISH ORGANIZATION AND BUSINESS MANAGEMENT

■ Implementation takes the RSA from its plan to initial operations. This 3–6-month process is described in the following three sections. Because the implementation should follow the format developed for local conditions and goals during planning, this section presents some general guidelines and examples of how other RSAs implemented their organizations. ■

In this phase, one or two persons start bringing to life the implementation plan outlined in Section 5.1. (See also Tables 16 and 17 for examples of tasks that must be accomplished.) The organization, whether part of a larger agency or independent, must be established. This means either organizational meetings within the parent agency or incorporation and the selection of a board of directors.

As an example of a ridesharing organization that is part of a larger agency, Figure 5 shows the organizational chart of the Knoxville Commuter Pool (KCP) in 1980. KCP was organized as a project administered by the Transportation Center of the University of Tennessee. It was later transferred to the City of Knoxville and then back to the University. The project director was also a member of the Board of Directors of the Knoxville Transit Authority.

Funding must be secured either as a line item in the parent agency's budget or from outside sources or both. A program of work tailored to the available funds must be laid out to start up the agency and to accomplish its operating goals. For example, offering ridesharing services to employers requires the groundwork of rationale, procedures, forms, vans, and matching and promotional services. It also demands persons to justify the service to employers and their employees and to deliver the ridesharing services. Job functions for the director and staff must be outlined to divide the work and provide for its management.

The work program should be developed by thinking through what needs to be done to accomplish the goals outlined in the planning phase. In addition to the planning and implementation processes suggested in this manual, assistance can be sought from RSAs operating in similar circumstances, having similar organization structure and providing similar services. Consultants can be hired either for specialized functions such as promotion, including advertising, or for more general assistance. Share-A-Ride in Silver Spring,

Maryland, used an engineering consultant to assist in the entire planning process. Promotional services were also obtained via subcontracts through the engineering consultant.

5.3 HIRE AND TRAIN STAFF

Once funding has been secured, the organization set up, a program of work and job roles laid out, and office space obtained, the next step is to hire and train the staff for the ridesharing operations. This is an important phase for the RSA because the success or failure of the organization will depend on the talents and attitudes of the persons hired.

Table 19 gives the job descriptions corresponding to the KCP organization chart in Figure 5. It is advisable to start small, then add staff as demand and budget permit. One idea for a minimal starting staff, for example, would be a ridesharing manager or field director, field representatives, and information coordinator. The local situation will influence how the staff positions are organized. For example, the use of many part-time persons for accounting, legal, and evaluating assistance in the KCP is possible because of the availability of these persons from the adjacent University of Tennessee. Similar assistance is usually available through a parent Council of Governments or similar organizations. In some highly industrialized areas, associations of employers or real estate development and management organizations share a common interest with the RSA and will provide supporting services. An agency separate from such a resource will have to rely more on hiring consultants and combining job roles; for example, the accounting person may also do secretarial work, and the formative evaluation may be assisted by a consultant or a university research resource.

Another important concept to keep in mind at this point is that the most effective ridesharing techniques are labor intensive. The personalization and familiarization methods require people instead of computers to reach clients and require people who can work well with many different types of people. A pioneer RSA in personalized ridesharing techniques, Commuter Service of the Metropolitan Transit Commission in Minneapolis, views their carpools coordinator as the key agent of the program. She must relate as effectively to an 18-year old factory worker as to a middle-aged executive. The personalized carpooling program run by New York DOT in Albany underscores the same point. Because infor-

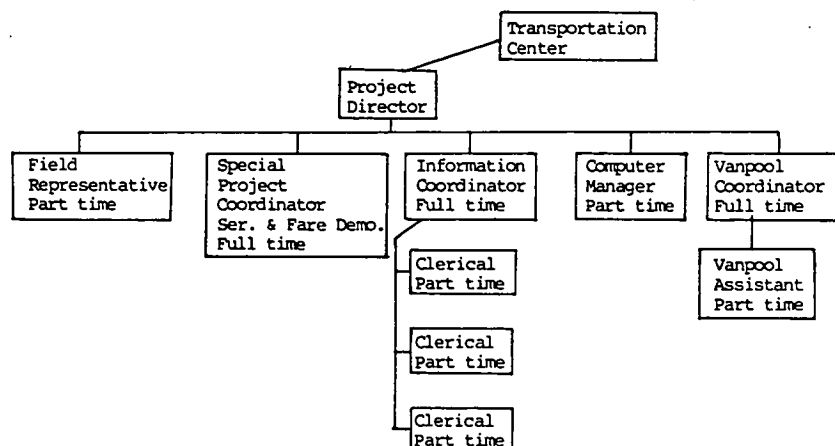


Figure 5. Knoxville Commuter Pool organization chart (June 1980).

mation on the potential ridesharer is limited, the neighborhood coordinator must be able to understand and communicate with the prospective ridesharer, and present ridesharing in a way that is uniquely effective for each.

This example reiterates a basic principle for the whole RSA: it is basically a personal service organization with the goal of offering, motivating the acceptance and delivering of ridesharing services. Except in times of transportation crisis, it cannot sit back and wait to be contacted. Thus *the persons hired for the RSA must in general fit well into an active outreach, personalized service organization. They must relate well to others both in person and over the telephone. They must be able to achieve commitment to ridesharing by a range of individuals and/or groups by providing a beneficial and positive experience with it.*

As a final example, in filling the job of vanpool coordinator—the major position in its vanpool program—RIDES in San Francisco had several qualities in mind: experience in coordinating activities, motivating people and interest in working for a nonprofit organization. To further emphasize their orientation toward active outreach, this position was placed on a commission basis. However, care must be taken to achieve good matches and effective information about pooling to avoid sterile staff competition and assure enduring, rather than short term, pools. If personnel are rewarded only for initiating new pools, rather than even more for maintaining pools, high dropout rates are guaranteed.

The staff training also needs to be people-oriented and sensitive to which target group is being approached. The new employees will need to become familiar with both the procedures and services of the RSA and how to present them to different groups. For instance, target groups living fairly close to work without dependents, who enjoy a high income and an available auto, are unlikely to be impressed with appeals to monetary or convenience savings. However, they may be attracted to ridesharing for social reasons or to help someone out. Also, those with a 30-mile commute each way or restricted auto availability might be persuaded to see a vanpool or carpool as cheaper, less exhausting, less lonely, and more convenient.

The director or promotion expert can expect to do this training through verbal communication and teaching and primarily by providing a good model. Preparing much formal written materials probably will not be worthwhile for the one to several persons being instructed. New staff can practice with each other and with trainers to polish telephone procedures and in-person presentations. Close and enthusiastic interaction during this period is important. It provides a better model than authoritarian supervision. This training should be followed up during the phase of contacting and working with the initial clients. Staff effectiveness can be expected to increase significantly as experience is gained. New York State DOT reports that its personalized carpool program using CETA employees as carpool coordinators became much more effective after several months of experience.

An alternative to hiring and training relatively inexperienced persons is to hire experienced but conservative professionals, particularly for the critical job of promotion to employers. Share-a-Ride in Silver Spring, Maryland, hired two field representatives who had extensive promotion experience. Because the field representatives were responsible for

Table 19. Knoxville Commuter Pool (KCP) staff positions (June 1980).

Program Director

The chief administrative officer is responsible for the overall planning, direction, and day-to-day operation of KCP.

Vanpool Coordinator

The vanpool coordinator is responsible for the development and promotion of the Knoxville Area Vanpool Association (KAVA), an organization of private vanpool owner-operators.

Computer Manager

The computer manager is responsible for development and implementation of the computerized rideshare matching system and its application to daily operations.

Special Projects Coordinator

The coordinator of special projects is responsible for the service and fare demonstration coordination.

Information Coordinator

The information coordinator receives telephone inquiries from persons seeking ridesharing information and is responsible for distributing related data and assisting members of the general public in the formation of pooling arrangements. He is also responsible for processing of survey forms.

Field Representative

The field representative is responsible for contacting employers to set up surveys. Part time position.

Source: Ref. (83) and KCP

all the employer contacts, the RSA felt that experience was really necessary for success. Training in this case consisted of orienting the field representatives to the area, the program goals, and the character of the RSA and involving them in preparing the marketing materials. The Share-A-Ride representatives not only promote ridesharing, but match applicants and follow up as well. They are key personnel: the coordinators in a personalized RSA service. Minneapolis used Public Service Options, a firm with established employer contacts and status among business leaders. Further information on staff duties associated with matching services is provided in Chapter Six. Appendix B summarizes suggestions by 10 RSAs on staff training and also outlines their staffing levels and positions.

5.4 INITIATE OPERATING FUNCTIONS

This marks the start of the RSA officially opening for business. Activity center, neighborhood organization, or employer contacts must have started 2 or 3 months earlier, of course, for there to be any ridesharing activity derived from those sources. A month is probably the minimum response time for any type of promotion. In an exceptional situation, the Golden Gate vanpool demonstration project concentrated its promotion in handouts to the commuters coming over the Golden Gate Bridge. At the end of a month, 3 vans were on the road. Note that Golden Gate had a captive audience, a direct way of reaching it, and no intermediary. The program was also operating under a great deal of pressure created by having 35 vans sitting in the Golden Gate lot. As an example of a more typical start-up, Share-A-Ride in Silver

Spring, Maryland, allowed a 5-month preparatory phase. The first 2 months involved planning and market research, and the subsequent 3 months were devoted to preparation of promotional materials and canvassing employers to obtain their support prior to the actual campaign. *In short, the first operating function of an RSA can most profitably be following up on organizational contacts made earlier.*

The start of business should mark the point where the RSA has a coherent program and can credibly and effectively offer its services to the public. As discussed in Section 5.1, the RSA should gradually phase in its services, starting with limits on the range of services offered, or with limits on the geographic areas covered, or with limits on both.

There may be a natural mix of initial services that depend on the RSA organization type and its environment. For example, an RSA operating out of a transit agency may find buspool services particularly easy to offer. In the case of TRI-MET Rideshare, being part of an influential transit agency and being immersed in a strong environmental planning setting, led to an integration of ridesharing services with environmental use permits. That is, the regional environmental protection agency now requires that industrial and commercial development plans must be keyed to ridesharing and transit programs with incentives to minimize environmental impact of the development before a use permit can be issued.

CHAPTER SIX

RIDESHARING PROGRAM OPERATIONS

■ RSA operations can be organized and discussed in a variety of ways. This chapter first discusses promoting ridesharing services to and through employers and to the general public (mass appeals). Next are considered specifics about targeting solo drivers in the local community according to their specific characteristics and needs, and the fundamental place of the coordinator in these operations. Carrying out matching techniques follows. The chapter ends with the crucial work of continuing evaluation for program improvement. The chapter draws heavily on the 4-cities study and on successful experiences of existing RSAs. Sections 3.5 and 4.6 are important background reading for this chapter. ■

The promotion of ridesharing begins early in the planning process because the assessment of traveler and commuter needs and the development of effective methods for meeting them is the core of the promotional process. When there is a good product, the marketing of that product is in part accomplished. However, as noted earlier, ridesharing is a new behavior to most commuters and travelers. Many are either unaware or inaccurately informed about carpooling and vanpooling. For others, indeed most, solo driving is a long-standing habit supported by lifestyle, psychological and logistics needs, and the social example of their peers. Therefore, no matter how sound and worthy the program, the acceptance of this innovation will require sound planning, enthusiastic implementation, and systematic operation of the promotional effort.

6.1 WORKING WITH EMPLOYERS

Almost all RSAs rely heavily on employer or employment-center-based marketing. There are 5 reasons for this:

1. Greater efficiency—It is more effective and usually less expensive to use existing company channels for distributing promotional materials, application forms, and other materials.

2. People prefer being reached through employment site to mass appeals.

3. Better matching opportunities—When applications are received from throughout the region, it is unavoidable that origins and destinations will be widely dispersed. Applications received from an employment site, however, automatically have a common destination. This will typically increase the number of matches available for an average applicant by a factor of five to ten.

4. Easier personalizing of services—The market segments at an employment site are easier to study, understand, and tailor matches for than the general public. (Home-end matching has its own potential for targeting because neighborhoods are frequently homogeneous.)

5. Unfamiliarity with home-end matching—Home-end matching can have many of the advantages of work-end matching. It has been less practiced, probably because home-end organizations, such as civic associations and Parent-Teacher Associations, are both less familiar and their officers or other potential contact persons would be harder to reach during normal working hours. Home-end matching may have advantages, however, which the RSA should consider.

6.1.1 How To Gain Management Cooperation

It is clear by now that employer-based ridesharing efforts are handicapped from the outset if upper management of that employer does not actively support those efforts. But how is their cooperation to be gained? How assured if it is agreed to and then not delivered?

Successful RSA experience has shown that in dealing with management, the key element is the same as with consumers: to offer them a service that will be of real benefit to them as well as their employees and make certain they realize the benefit.

Like commuters, private enterprise employers rarely will respond to appeals on altruism alone, but they are naturally always alert to company interests. Thus, the RSA must be prepared to offer some real benefit to them, whether it be a solution to their parking shortage, access to a (needed) larger labor pool, "getting the air pollution agency off our backs," or giving them a chance to participate in a public service for those companies who desire this. Even the research process that was employed by the authors proved to be a benefit to some employers who reported that their employees appreciated the interest in their needs that the research demonstrated. This is a clear demonstration of the well-known "Hawthorne Effect." If the RSA does indeed have something that can be of value to them, the basis exists for a mutually beneficial exchange.

This means the RSA will have identified (at least some of) their problems and concerns, and will have come prepared to offer possible solutions. Their transportation problems should be further investigated at the first meeting. One RSA obtains a "company case history" at the first meeting, and uses it to try to make the ridesharing services more relevant to that employer.

In obtaining such information or doing such a case history, it is vital to establish a cooperative relationship with the employer and to respect the privacy of the employer. Unwelcome probing is likely to result in the RSA being kept out rather than welcomed as a collaborator or as a service. On the other hand, the fullest interest should be in demonstrating interest in the objectives and problems of the employer. Some knowledge of the industry and of the employer's position in the community and in that industry is always valuable. Information about the company's track record for the acceptance of new programs can provide an entry or avoid an undesirable friction. The best advice may be to remain alert for such information as can be obtained readily and informally and to contact chambers of commerce and boards of trade as discussed in Chapter Three. Restricted parking, poor transit, and bad roads can be observed. This manual and the supporting research report can help provide a profile of workers at various levels and in given kinds of communities (see App. D). Where one cannot learn about the kind of employees in the firm, it is useful to develop a list of key questions to discuss with the employer.

6.1.2 Reaching the Employer Where He Lives

The next step is promotion. Many RSAs have found this to be very difficult. The only proven technique for doing this, in a noncrisis situation, is a personal meeting with management. Further, the RSA should bring to this meeting a firm, specific

attitude—that a mutually beneficial relationship is being sought. All RSA policies, correspondence, promotional material, and personnel training should reinforce this attitude. Employer response is poor when the RSA comes "asking for a favor." It is important that RSA staff know that it is not asking a favor but is offering a service of value to the community and the management and employees of the corporation that is part of it.

All commitments should be made in writing. This reinforces the serious, business-like nature of their relationship. Commuter Computer of Los Angeles has developed a "Client Letter of Understanding" for this purpose. It specifically describes what the RSA will do and what the employer will do (see Exhibit D). It includes:

- A definition of the role of the agency.
- Benefits to the employer.
- The role of the employer.
- The service policy, including the commitment of the parties, and the structure and function of the agency, as well as economic and legal arrangements and services

The tangible ways in which an employer can support the ridesharing program include:

- Endorsements—a letter from the chief executive officer to accompany the application form, plus articles in the house organ, posters on bulletin boards, etc.
- Access to employees—providing meeting rooms and allowing employees to attend ridesharing presentations during work hours, cooperation of personnel staff for mailings or updating files, use of internal distribution facilities, distribution of leaflets in parking lots, etc.



COMMUTER COMPUTER

3440 Wilshire Blvd. • Suite 610 • Los Angeles, CA 90010 • Telephone: (213) 380-RIDE

This letter is to outline our understanding of the working relationship between _____ and Commuter Computer in promoting ridesharing services for the participation of _____ employees. Outlined briefly are the activities which Commuter Computer expects to perform for you, as well as those activities which you understand you must provide in order that an effective program can be implemented.

Commuter Computer will provide a ridesharing registration program for the employees of _____ which includes the following activities:

- Meeting(s) with Company management to develop ridesharing programs which meet identified needs.
- Meeting(s) with Company's first-line management (Workshop Coordinators) to explain the registration process.
- Provision of registration forms and accompanying ridesharing explanation pieces.
- Processing of registration forms to provide you with:
 - a) Statistics on ridesharing activities and AQH/D approved formulas for development of your AQH/D traffic abatement plan.
 - b) Evaluation profile to enable segmentation of employees for appropriate ridesharing programs.
 - c) Master list of all employees registered in the program.

Exhibit D. Illustrative client letter of understanding.

- d) Current employee information by updating ridesharing data periodically to ensure accurate information for AQMD compliance.
 - Processing of registration forms to provide your employees with:
 - a) A listing of fellow employees interested in sharing a ride on a limited basis, i.e., emergency ridesharing program.
 - b) Opportunities to share a ride on a regular basis or join an alternative ridesharing program such as vanpooling, buspooling or taxipooling.
- will provide the following services:
- Assign an employee with decision making authority to serve as Ridesharing Coordinator throughout this relationship.
 - Facilitate the workshop process so that first-line managers are apprised of Commuter Computer programs and their role in promoting ridesharing activities.
 - Strive for a level of 80% employee registration and to actively promote 100% registration.
 - Distribute Commuter Computer registration forms to all employees and secure the return to Commuter Computer of same with complete and accurate information.
 - Expedite the distribution of ridesharing matchlists to all registered employees.
 - Allow qualified employees to attend twenty (20) minute vanpool, buspool or taxipool presentations conducted during normal working hours, and to provide adequate meeting facilities for same.
 - Promote Ridesharing Registration by posting bulletin board materials provided by Commuter Computer, printing releases in newsletter or other house organ and permitting display of alternative ridesharing vehicles, such as commuter vans, in highly visible areas.
 - Provide continuous update of Commuter Computer-supplied alphabetical listing of participating employees by circling the names of terminations.
 - Twice a year distribution and collection of update forms to participating employees.
 - Assign staff member(s) to scan all forms for complete information before submitting to Commuter Computer for processing. (Commuter Computer will provide a scanning tool to expedite process.)

Exhibit D (Continued)

- **Facilitation**—especially designating a person within the company who has both the authority and the available time to see that things get done. It is useful to have a transportation coordinator with responsibility for both parking and ridesharing and perhaps to get in addition, flexible and compressed work schedules to assist in solving commuting problems and personalizing the ridesharing process.
- **Incentives**—possibly including preferential parking, working schedule adjustments, financial incentives, company vanpools or buspools, transit passes, personal recognition, etc.
- **A company ridesharing coordinator**—preferably someone who is authoritative (has significant power or direct access to someone who does), who has enough time to carry out the functions, and who is enthusiastic about the new role. If possible, the RSA should try to build an ongoing role for the ridesharing coordinator (for example, managing any preferential parking distribution, distributing new RSA literature periodically, monitoring existing pools to prevent problems).

The written agreement can specify those items that you feel most appropriate, but the most important is the appointing of a good ridesharing coordinator.

It is understood that the working relationship between Commuter Computer and _____ is established for a minimum of one year, with continuation under the same agreement for as long as the program is in effect. Services provided by Commuter Computer are at no charge to _____ provided that the necessary elements are carried out in good faith and for a minimum of one year period which is needed to establish an effective program. Should you wish to discontinue the program after the first year, employee data maintained by your company identification number at Commuter Computer will be converted to individual status and service to individuals will continue to be provided on that basis.

Commuter Computer makes no claim to exclusive representation of any company, employee, or any ridesharing mode. Information obtained from registration will be used by _____ and Commuter Computer for ridesharing purposes only.

If the above meets your understanding and agreement, please indicate by your signature below. Please return the original copy of this letter to Commuter Computer and retain a copy for your files.

We look forward to implementing a successful ridesharing program with _____ and anticipate a mutually cooperative relationship.

Sincerely,

COMMUTER COMPUTER

Transportation Representative

cmh

APPROVED FOR

(signature)

(title)

(date)

In addition to face-to-face meetings, many RSAs use a variety of supplementary promotional techniques when working with employers. These are summarized in Figure 6.

An audience with upper management can frequently be obtained through introductions through the mayor, a Chamber of Commerce officer, or Board of Trade representative. The enthusiastic participation of the community leader is important. An introductory phone call from the RSA to the company using the name of the referring person can be used to stimulate initial interest and arrange for a personal meeting. It is wise to have an introductory letter explaining the program. This can be mentioned during the initial call and sent as a follow-up in order to provide a record for the files which most companies will want.

Group workshops or discussions for employers are often used to make more productive use of RSA staff time. However, the workshop approach should be used only as a "lead-gathering device," supplemental to personal meetings. That is, they should be used as a screening process to avoid wasting much time with employers with low interest levels. The workshops can also bring peer influence to bear on marginally interested employers, by bringing them into contact with more strongly interested employers. An invitation to active problem-solving and participation by the employers is

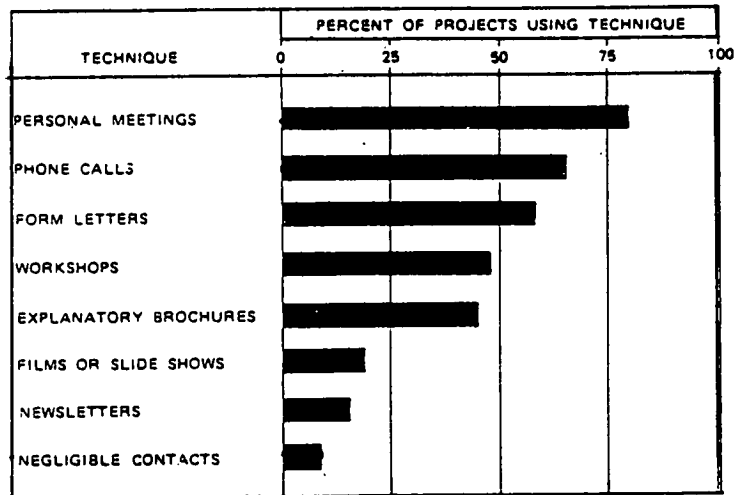


Figure 6. Employer-oriented promotional techniques. (Source: Ref. (2))

a valuable program aid as well as a motivational principle. The meeting should never be a lecture or an exhortation.

About half of the RSAs have devoted substantial time to development of *explanatory brochures*. The best use of these brochures is as a backup device—a leave-behind piece which reinforces what the RSA representative told management. Many years of research by the authors and others revealed the effectiveness for acceptance of innovation of print material, left for the private examination. The brochure, however, cannot take the place of the personal meeting.

A few RSAs have used promotional *films or slide shows* for management presentations. These may not be appropriate for some situations. Upper management is often too busy and may not relish entertainment to make a business decision. The cost/benefit of such endeavors should be explored carefully.

Finally, a handful of RSAs have published employer-oriented newsletters to help maintain continued interest and reinforce employers already committed to ridesharing by providing positive exposure for their actions in an information piece read by their peers. It can also be used to convey new information on ridesharing developments or legislation that might affect employer commitment; and it can create an environment of acceptance (a bandwagon effect) for ridesharing by letting employers know what others are doing.

In summary, the RSA must conduct itself in a business-like way if it is to deal successfully with business. Companies, like commuters, must be approached in a style that is comfortable for them and from the point of view of their own needs, perceptions, and motivations. Further, respect for the RSA will be enhanced if the employers can see a well managed, business-like operation.

6.1.3 Preparing for Promotion to Employers

What constitutes good preparation for promotion of ridesharing to employers? The answer appears to lie in the application of the same principles that are applied to commuters. That is, employers are one of the RSA's major target

groups. They can also be divided into market segments, each of which will require a specific approach. An RSA will similarly want to investigate their present and future needs, their decision-making processes, and how they perceive the RSA. It will be necessary to examine the elements of macroenvironment (especially government and economy) that may affect these employers and their decisions.

6.1.4 Disaggregation

The RSA might first segment the employer market by location, looking for employment areas with more than 500 employees (to improve the odds of finding carpool or vanpool matches). Within those employment areas or centers it might look for the medium or larger employers or groups of employers who can be serviced more efficiently. One would look for those employers with stable (and perhaps similar) work schedules, again to improve matching. Finally, as more is learned about sociological factors in ridesharing, one would begin to look for companies with certain types of employees, who have greater likelihood of ridesharing.

The data for this type of market analysis are probably available locally—at the Chamber of Commerce, Census Bureau, unemployment agency, etc. The result of this investigation will be a fairly clear picture of the geographical areas or industries and the companies that should have high priority.

6.1.5 The Employer's Needs

Looking at each employer as a potential consumer, the RSA would first identify important needs (that is, problems that the RSA might help to solve). These could include: parking shortages, building and maintenance of access roads, air pollution regulations, energy conservation regulations, company-caused traffic congestion, limited labor pools, or maybe even a "bad image" for reasons unrelated to transportation.

The next step is to examine the perceptions of the employers with regard to the RSA and with regard to rideshar-

ing. For example, if the RSA is a government agency, might there be some distrust by private employers? What causes this distrust and how can it be overcome? If the RSA is a private entity, might there be some questions about security of funding and permanence? In relation to ridesharing itself, has there been some poor company experience in the past, and if so, how can the bad impression be erased? Has the earlier effort been unproductive? Are there any management concerns about union reactions? What can be done about these? It is quite clear that such perceptions must be identified—and, hopefully, any problems solved in advance—so that the RSA can be prepared for both the spoken and unspoken questions that will arise.

6.1.6 Other Considerations

6.1.6.1 Budgeting

One RSA found that each employer will require from 20 to 40 hours of the RSA representative's time, depending on company size and level of cooperation. Another "rule-of-thumb" is that approximately one person will be required for support for each representative (for typing, record-keeping, data gathering, etc.). These two guidelines can be used to estimate staffing requirements, once the yearly objective of number of companies to enlist has been set. With experience, the RSA will develop its own estimates of cost per employer or employer type.

6.1.6.2 Finding Talent

Good RSA representatives are difficult to find. They tend to be young, which means enthusiastic but untrained, consumer oriented, and with outgoing personalities. However, this is a young industry and experience is either lacking or frequently in the eye of the beholder. It is probably sounder to keep an open mind, and assess over time who does the best job with which employers and employees.

6.1.6.3 Checklists

Nearly every ridesharing agency has some form of employer handbook or guidelines that assist employers in planning and implementing a ridesharing program. Exhibit E, from Chicago Commuter Computer, illustrates a series of brief checklists for this purpose on four topics: deciding on a company program, conducting a ridesharing feasibility study, implementing a carpool program, and considering different ridesharing incentives. Probably its chief weakness is a lack of detail on vanpool program alternatives and steps.

6.2 PROMOTION TO EMPLOYEES

After the cooperation of a specific employer has been won, the RSA must be prepared for a smooth transition into the next step, promotion to employees (commuters).

6.2.1 Promotional Activities

The techniques typically used to date to promote ridesharing to commuters at their work site are shown in Figure 7.

Each promotional device, whether it is a poster or a presentation, should be carefully prepared and specifically targeted to a well-defined market segment. For example, one

might elect to give vanpool presentations to those who live more than 15 miles from work and have regular work schedules. *No printed materials can substitute for active outreach approaches: presentations, employee discussion groups, and personalized matches through a computer.*

In the past, since most RSAs have placed great emphasis on hand or computer carpool matching, the most frequent method of communicating with employees has been the carpool matching (or ridesharing) application form. This has usually been accompanied by a letter (often written by the RSA) from the chief executive officer of the company. Other RSA material, such as brochures, may also accompany the application form. *The application form, unaccompanied, should not be used as a contact or promotional device.* It may be regarded as either trivial or invasive if it is not merely an adjunct to a personalized approach.

Other commonly used promotional tools have been bulletin board posters, bumper stickers, and explanatory brochures written to employees. The companies may get involved here, by printing their own posters or leaflets. This kind of involvement should be encouraged: it creates company and employee commitment because they begin to see the ridesharing program as "their own."

Less frequently used techniques have been articles in company newsletters (often ghost-written by the RSA); information displays in cafeterias, entrances, and other busy places; presentations directly to employees (usually by company officials and RSA staff); and lapel buttons.

Several words of caution are in order about promotional materials in the workplace. First, you should use the minimum number necessary to deliver your message, rather than flooding the company with many different materials. The ridesharing program should not appear to be more important than the company's business. Although each company may be different, a good "minimum set" would be posters and brochures along with the important letter of endorsement to accompany the application form.

Good promotional material is usually time consuming and expensive to design. Much of it is also adaptable from one population to others. So once an RSA clearly understands the needs, materials that other RSAs have developed can be examined to see if any of them are suitable or suggest courses of action. Appendix B presents such materials, along with sources of some outstanding manuals and handbooks and examples of several well-conceived leaflets or posters.

6.2.2 Employer-Based Incentives

Employer-based incentives that can be suggested to increase the response to ridesharing promotion and services are mainly of these types:

- Flexible working hours.
- Preferential employee parking and parking fees.
- Use of company vehicles.
- Equivalent treatment of transit riders.
- Fleet ridesharing.
- Special vanpool and buspool incentives.

6.2.2.1 Flexible Working Hours

Flexible working hours, which are desirable for employee morale, traffic reduction, and ridesharing incentive reasons,

DECIDING ON YOUR COMPANY PROGRAM RESPONSIBILITY



RIDE SHARING TEAM	FIRM	MANAGEMENT COMMITMENT:	Planned	Initiated	Completed
•	•	Preliminary discussions with management and the ridesharing team representative	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	•	Feasibility study conducted (to be done jointly by Ridesharing Team and company, see reverse side for details)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	•	Proposal made to management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	•	Program coordinator appointed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	•	Pilot program approved for implementation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	•	Implementation Plan and timetable established	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DEPARTMENTS CONTACTED FOR ADVICE AND/OR ASSISTANCE:					
		Transportation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Administrative Services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Energy Conservation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Environmental Protection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Union Representatives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Insurance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Legal Counsel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Public Relations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Accounting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Payroll	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Parking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

RIDESHARING FEASIBILITY STUDY



PREPARE DATA BASE

- .Collect the zip-codes of employee home locations.
- .Plot the numbers of employees within each zip-code on a map.
- .Locate the major public transportation routes and terminals on a map.

ESTIMATE THE RIDESHARING POTENTIAL

- .Estimate the potential for increased use of public transportation. Can a particular route be made more accessible through the use of a company shuttle or a bus pass program?
- .Estimate the potential for buspooling or subscription bus by locating tight clusters of 40 or more employees living 5 or more miles from the work site.
- .Estimate the potential for vanpooling by locating clusters of 15-20 employees living 10 or more miles from the work site.
- .Estimate the potential for carpooling by locating clusters of 4 or more employees living 3 or more miles from the work site.

EVALUATE ALTERNATIVE WORKHOURS

- .Can staggered or flexible hours be implemented at the work site?

ESTIMATE RIDESHARING BENEFITS

.Parking savings (assume that half of the estimated potential (in II) will actually form a pool)

[# of carpools _____ ÷ 2.5]	x 1.2 =	_____ cars removed
# of vanpools _____	x 6.5 =	_____ cars removed
# of buspoolers _____	x 0.8 =	_____ cars removed
# of new transit riders _____	x 0.8 =	_____ cars removed

.Energy savings

Energy Savings -- 2 [_____ x _____] $\frac{14.0}{\text{average miles per gallon}}$
 Per Day # of cars removed one-way trip length

ESTIMATE RIDESHARING COSTS

(See section 5 in the manual, How Ridesharing Can Help Your Company)

Assume a 50% reduction in costs if your company uses the services of the Ridesharing Team.

SUMMARIZE FEASIBILITY RESULTS

SELECT PILOT TRANSPORTATION PROGRAM'S

Will you want to initially target carpooling, vanpooling, public transportation or buspooling markets -- or a combination?

OBTAIN APPROVAL FROM TOP MANAGEMENT

ESTABLISH IMPLEMENTATION PLAN AND TIME TABLE

IMPLEMENTATING A CARPOOL PROGRAM



RIDESHARING INCENTIVES



RESPONSIBILITY								
RIDE SHARING TEAM	FIRM	Planned	Initiated	Completed	Investigating	Unfeasible	Implementing	
•					Preferential parking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	•				Toll compensation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	•				Reduce or subsidize parking fees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	•				Rescheduled work hours	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	•				Get-acquainted coffee breaks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	•				Cash bonuses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	•				Flexible or extended lunch times	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	•				Honor roll publicity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	•				Honor roll publicity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	•				Loading zones and shelters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	•				Recognition Certificates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	•				Travel aids	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	•				Drawings for U.S. Savings Bonds, gifts, gift certificates, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	•				Transportation from passenger gathering locations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	•				Flexitime or Staggered work hours	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	•				Allow work time for ridesharing related errands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	•				Extended vacation time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	•				Shift choices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	•				Flexible break times	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	•				Awards for largest/most long-standing rideshare groups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	•				Recognition in company publication	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	•				Gas allotments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
•	•				Lunch hour transportation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Exhibit E (Continued)

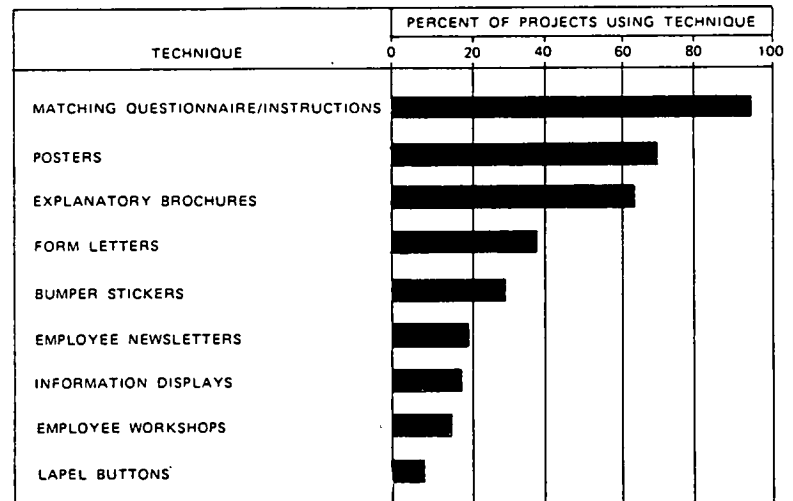


Figure 7. Employee-oriented promotional techniques. (Source: Ref. (2))

are covered in Section 7.3 and the other incentives are discussed in the following. Employer receptivity has been highest in the past to providing the first two incentives. The third incentive is rare, although promising, and the last three are of increasing interest, although not yet widely used.

6.2.2.2 Preferential Employee Parking and Parking Fees

Nature and Purpose. The purpose of giving ridesharers preferential parking privileges or rates at work is to induce and maintain ridesharing by increasing parking convenience or reducing its cost for ridesharers. Techniques include:

- Where parking space is limited, giving ridesharing pools either guaranteed spaces or preference in obtaining parking permits.
- In large lots, assigning carpools and vanpools to close-in spaces (sometimes only until a given time such as 10:00 a.m.).
- Where inside parking is available, allotting the spaces to ridesharing pools or giving them preference in obtaining inside parking permits.
- Providing special carpool, vanpool, and bus-loading zones.
- Assigning spaces with name tags to poolers for the prestige value as well as for control.
- Where fees are charged, giving ridesharers reduced rates or free parking.

Examples and Effectiveness. The results of parking incentives are treated extensively in the literature, although quantitative cause and effect relationships are not known. References 61 (pp. 95–100) and 62 (pp. 90–91) describe several examples of parking incentives, mainly invoking reservation of the closest parking spaces for carpools and vanpools. A typical example of price incentives is a major bank headquarters in a CBD that charges \$40/month for solo autos, \$30 for 2-person carpools, \$20 for 3-person carpools, and nothing for 4 or more person carpools or vanpools. The main conclusions from such recent experience are that:

- Scarce, remote, or expensive parking by itself provides

one of the strongest single incentives to ridesharing, as already explained in Section 2.3.

- Under such constrained conditions, preferential parking is effective in increasing the success of employer carpooling programs; in some case resulting in average auto occupancy rates of 2.0 or more.

- However, at least 80 percent of employees (7, p. 38) do not face parking shortages or significant costs at work, in part as the result of zoning ordinances, especially in suburban areas, that require a high ratio of parking spaces per employee.

- Employees and unions typically object vigorously if free parking is curtailed or charged for because it has become taken for granted as an employee benefit. Only where company growth creates actual or potential parking shortages, as in the Tennessee Valley Authority and 3M cases, has substitution or ridesharing for parking been relatively easy.

The problem seems to be one of reducing an existing employee benefit (plentiful free parking) in the apparent interest of broader societal aims such as energy conservation. The remedy lies in convincing employers that (1) it is in their own interest—for reasons such as an expanded labor pool and less vulnerability to fuel shortages—to encourage ridesharing; (2) unrestricted free parking constitutes an expensive fringe benefit that encourages solo driving and severely limits the effectiveness of a company ridesharing program; and (3) encouraging only solo driving neglects providing equivalent benefits to employees who would prefer to pool or use transit. Some practical steps to suggest for the employer once he agrees with this philosophy are for him to:

- Work with the union and employees to explain the need for a ridesharing program and the conservation of parking space and costs (see “Reduced Parking Costs” in Section 1.1 for estimates of parking costs per space).

- Offer preferential parking to poolers and, in addition, consider offering equivalent benefits to solo drivers and transit riders through means such as transit passes or parking passes that have a cash value if not used (see the last topic in this section for details).

- Consider revision of the employee parking policy from

allowing unrestricted parking to one that encourages ridesharing.

The following prototype statement, adapted from the current policy for one employer, could be suggested to employers for their use in place of unrestricted parking policy:

Our company is cooperating with local communities to reduce vehicle travel, in the interest of clean air and conserving fuel. Before you plan to drive alone, you are invited to check with our ridesharing coordinator on available commuting alternatives from your residential area. Company parking is inadequate to provide space for each employee's private automobile, which would be an expensive subsidy to solo driving, and preference in parking location is given to carpools and vanpools. However, limited parking is available to accommodate those who may be unable because of working hours to take advantage of ridesharing alternatives.

Another fruitful avenue is for the RSA to advocate changes in local zoning laws from requiring high minimum levels of employee parking to specifying low maximum levels plus adoption of a company ridesharing program (see "Parking Supply Restrictions and Zoning Requirements" in Section 7.3). Note, however, that constraints on employee parking may cause a spillage of cars into adjoining areas such as residential streets if parking is easier or cheaper there.

A final consideration is the need for safe, well-lighted meeting places for pools; this has been found to be important to many poolers (4), and the objective can readily be met at the same time preferential pool parking places are designated.

6.2.2.3 Use of Company Vehicles

Nature and Purpose. Employers can provide use of company vehicles to ridesharers to run errands during the day or to return home after late meetings. The purpose is to make it possible for employees to rideshare and still perform errands or meet the demands of occasional late meetings, thus promoting ridesharing by reducing the inconvenience of giving up a personal auto.

Examples and Effectiveness. Allowing use of company vehicles for errands and late meetings is thought to have a positive effect on ridesharing, but again no precise cause and effect relationship is known. The Lawrence Livermore Lab's ridesharing program, discussed later, allows the use of company vehicles for returning home after late meetings. This policy, although little used, is seen by employees as evidence that lab management is solidly behind the ridesharing program. Such an effect on employee perceptions is important because in most large, bureaucratic organizations, actions speak louder than words to employees, who are cynical about the organization acting in their own interest. No specific examples are known of providing company vehicles for personal use during the day, but it is common to have vehicles available for official use by staff members, and a charging system can easily be instituted to recover the total costs for personal use. Encouraging or subsidizing transit use is of course an alternative to use of company vehicles where transit service is adequate.

6.2.2.4 Fleet Ridesharing

Nature and Purpose. Fleet ridesharing involves use of

employer vehicles for employee ridesharing in off-work hours. The purpose is to encourage ridesharing by providing vehicles to employees at a lower cost than they can drive their own vehicles. Fleet ridesharing may also allow the employer to save money by sharing fixed fleet auto costs with employees and by reducing the need for parking at the work site.

Simplicity of operation is an important appeal of fleet ridesharing. Its main aspects are easily summarized: vehicles designated for the program are driven home at night by employee commuters and are back in the garage by the start of the next work day. This allows both company business and commuting needs to be met with no additional capital outlay. Costs of the commute use are reimbursed by the riders through a monthly billing. Exhibit F illustrates the steps in setting up and operating a fleet ridesharing program.

Other features of the concept may include:

- Charging riders the marginal commuting cost plus a prorated share of fixed costs of fleet cars, or subsidizing the operation by charging only marginal commuting costs.
- Fueling vehicles from the employer's fuel supply, thus assuring participating employees of a more reliable fuel supply in case of a shortage.
- Basing charges on mileage logs that are updated whenever the pool's monthly mileage changes more than 10 percent in a month. Charges may or may not be prorated among riders in a vehicle, depending on how comparable their distances from work are.
- Requiring drivers to take a defensive driving course and to have a good driving record.

Examples and Effectiveness. Fleet ridesharing programs in Bellevue, Washington, and Ann Arbor, Michigan, are described below (63).

After 3 months of operation, the City of Bellevue, Washington, has 12 carpools and 51 city employees participating. There is also a waiting list of four to five carpools. Carpools average four members and drive an average of 31 miles daily in the city's fleet of AMC Concorde, Pintos, and several larger cars. A marginal cost of 11 cents/mile is charged for each vehicle.

Average gas savings for the program are 75 percent of the participants' former use or about 1370 gal per month per car. Total vehicle-miles are down by about 25,000 miles per month and the program has reduced demand for city hall parking by 30-40 stalls.

Ann Arbor, Michigan, operates a program similar to that of Bellevue. A part-time coordinator spends about 5 hours per week administering the program with its 13 carpools and 44 riders. The fleet consists of Pintos, Chevettes, and a few older, bigger cars. Fees are 13 cents/mile for smaller cars and 15 cents/mile for bigger cars. The Ann Arbor program sets up carpools on a neighborhood basis, thus increasing the social appeal of the concept.

Fleet ridesharing was pioneered by the California Department of Transportation and has been actively promoted by Seattle/King county Commuter Pool. Either organization can supply background and promotional materials.

6.2.2.5 Special Vanpool and Buspool Incentives

Nature and Purpose. There are a host of minor ways of

Delta Chart for Fleet-Ride

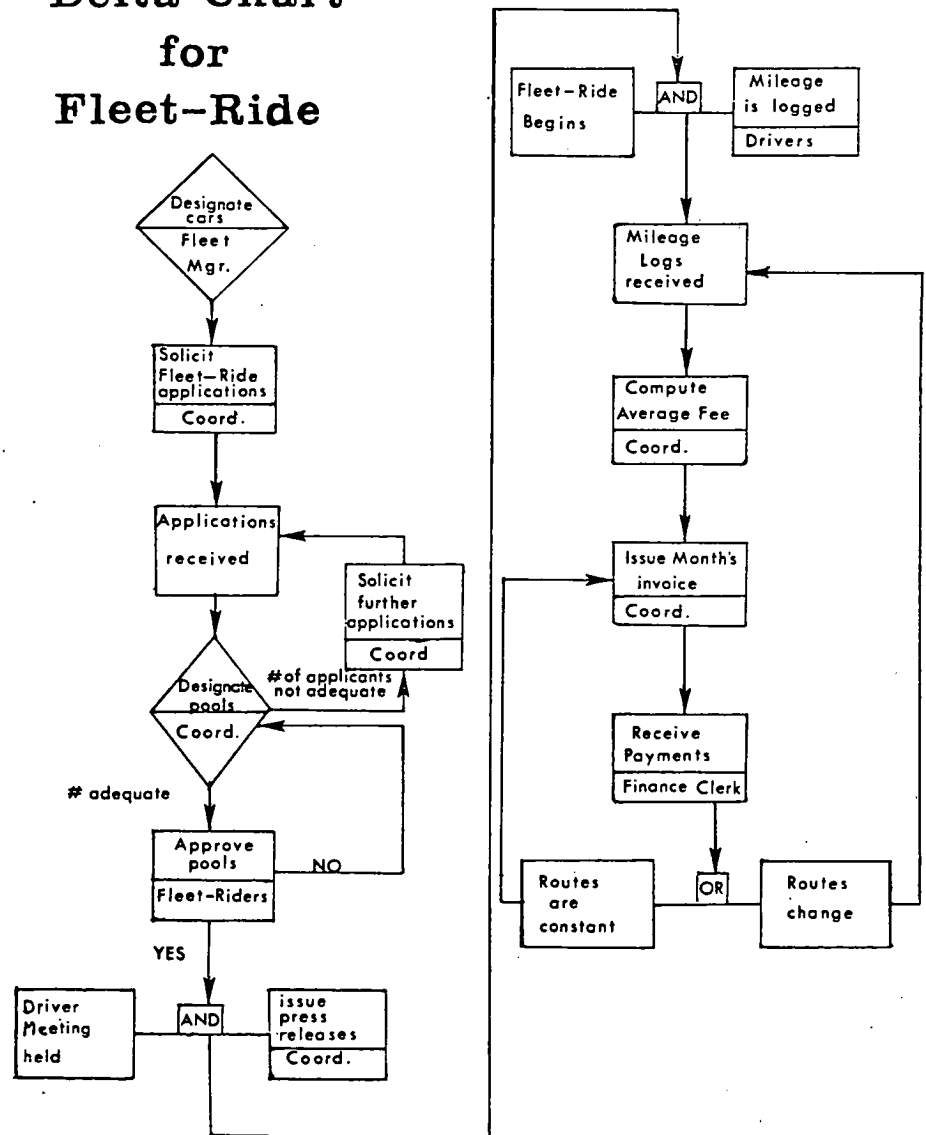


Exhibit F

encouraging ridesharing among vanpoolers and buspoolers besides those already mentioned. They include:

- Assistance in finding advantageous vehicle prices, loans, and insurance. (See Appendix C for an example of a private loan arrangement facilitated by an employer.)
- Time off from work to attend vanpool or buspool organization meetings.
- Free or discounted physical examinations for obtaining needed driving licenses.
- Free defensive driving classes.
- Free or low-cost membership in an employee, community, or national vanpool association to obtain merchant discounts on vehicle supplies, parts and services, and insurance, as well as other benefits.
- Subsidies of empty seats during the first month or two of operations.
- Payment of van fares while employee is away on business.

- Priority access to low-cost fuel by refueling at the work site while the van or bus is parked.
- Free or low-cost insurance.
- Personal use of van by driver at cost.
- Use of company-owned backup vehicles.
- Free vehicle shuttle service to outside maintenance shops.
- Free or low-cost vehicle maintenance.
- Cash bonuses to drivers above a break-even load.
- Reduced fares for all riders, set to recover less than total employer costs.

Examples and Effectiveness. Each of the indicated incentives is designed to reduce the cost, risk, or inconvenience of vanpooling to drivers or riders, and they are used in various combinations. The first four incentives appear to be most common, whereas the others are in sporadic use. The first incentive is appropriate only for owner-operated vehicles; the next eight incentives are appropriate for either employer-

owned or owner-operated vehicles; and the remaining incentives tend to be limited to employer-owned vehicles. The effectiveness of individual incentives on the list is not well documented, and their cost can vary according to employer policies for pricing the incentive. See also Exhibit E for other examples of employer-based incentives.

6.2.2.6 *Equivalent Treatment of Transit Riders, Cyclists, and Pedestrians*

Nature and Purpose. Many employers are concerned when their sponsorship of a company ridesharing program is suggested, about the prospect of inequities arising from preferred treatment of one mode of commuting compared with others. One increasingly popular solution is to offer both preferential parking (or other incentives) to pools and discounted or free transit passes to transit riders. A more innovative but compatible proposal is to use parking revenues to finance a ridesharing and transit pass program; and another is to offer free parking stickers to all employees, which can be redeemed for cash if not used.

The use of transit passes or transit fare prepayment (TFP) involves prepaid bus tickets of varying types. The tickets may be valid for a day, a week, or a month, or for a certain number of rides, such as 10 or 20. As a convenience for riders, transit companies have traditionally provided the passes at various public places and through cooperating employers. Occasionally, transit companies or employers have sold the passes at a discount to promote transit ridership.

A further step in transportation equity is to facilitate the complementary energy-efficient modes of bicycling and walking. Working with local governments to provide safe bicycle and pedestrian access may be important in suburban locations. Provision of showers and dressing rooms is much appreciated by bicyclists, and at least one employer (Lawrence Livermore Laboratory, again) goes even further by offering free repair of bicycle flats and other minor problems during working hours.

Examples and Effectiveness. Recent UMTA demonstration projects in Sacramento, California, and Jacksonville, Florida, have tested the effects of selling discounted passes through employers. In Sacramento, about 5 percent of the employees eligible for the pass program both switched to transit as a result of a 25 percent, 3-month long pass discount, and kept on riding after the discount ended. In Jacksonville, only about 0.5 percent of the eligible employees switched to transit following a 14 percent discount of passes marketed through employers. This demonstration did confirm the importance of a discount because only a negligible percentage switched to transit prior to the discount despite intensive employer marketing of the passes. MBTA in Boston reportedly has had good results marketing slightly discounted bus passes through employers. These programs indicate that short-term discounts of transit passes by employers can achieve a modest shift to transit.

Examples of free or highly subsidized transit are (1) the Seattle First National Bank (SeaFirst) which buys annual bus passes for any interested employee at a cost of \$120 to \$190 per year and (2) several Los Angeles firms, such as ARCO, that offer free basic monthly bus passes to employees, good for minimum fare trips. SeaFirst is considering a ridesharing program, and ARCO already has one that includes a

\$22/month subsidy for riders of Commuter Computer vans. SeaFirst provides no employee parking, although a small commercial garage in the Bank building has space at \$60/month. ARCO has few parking spaces, but does provide free parking for vanpools in company spaces.

In neither the SeaFirst nor the ARCO case is pooling encouraged by the transit passes, but transit use certainly is, and a kind of equity is achieved by ARCO between transit users and vanpoolers. *Note that employer vanpool subsidies can largely be avoided by sponsoring lower cost owner-operated vans (see Section 4.3).* However, there will usually still be some indirect employer ridesharing subsidy in the form of paid ridesharing or vanpool coordinators.

Stanford University has instituted parking fees and uses them for another transportation purpose, that of operating a university-wide bus system. However, Stanford does not have an aggressive ridesharing program, and, as yet, there is no known example of parking fees used to finance a comprehensive employer ridesharing and transit pass program.

A creative, but also so far unused, equity proposal is to offer an employee one parking sticker each quarter that is valued at \$10 per month or so. Employees who decline the sticker would have that amount added to their monthly paychecks. This procedure will encourage both pooling and transit use. However, the effect on pooling, transit use, and parking demand may be sensitive to the value of the parking sticker, so an employer should be prepared to increase its value if results are less than expected.

Three final examples: (1) Gulf Oil provides an unusual cash incentive to vanpoolers by paying for missed rides due to overtime work of company-related travel; (2) Pacific Bank in Seattle pays \$10 monthly to each employee who commutes for at least 10 miles round trip on a bus, carpool, vanpool, or bicycle for 15 days or more per month; (3) the Arizona Bank buys bus passes and resells them to employees at half price, and for ridesharers they pay \$5.20 per month each towards parking costs. It should be noted that this and other such cash incentives, like company retirement plan contributions, are usually construed as income by the Internal Revenue Service.

6.3 PROMOTING RIDESHARING TO THE GENERAL PUBLIC

The purposes of mass-media ridesharing promotion directed to the general public are (1) to reach solo commuters who are ready to rideshare and cause them to act—either by calling the RSA or by finding their own ridesharing arrangement; (2) to inform the public of the availability and importance of ridesharing; (3) to make it clear that ridesharing is a widespread activity—not a unique practice by only a few. The RSA should not rely on the mass media for attitude change, because they generally do not have the budget or the technical expertise to mount an effective attitude-changing campaign. These require not only sophisticated media approaches, but complementary community activities at the same time. It is important to increase the public's readiness to accept this new transportation option and to consider that it has potential benefits for them. The promotion to the public is important if only it increases public awareness and improves the general climate of opinion for ridesharing.

Looking back at the promotion concepts presented in Chapter Four, it is clear why region-wide approaches to the

public are so difficult to carry out as the only means of reaching consumers.

- There is diversity among the potential consumers, so it is difficult to determine their needs and preferences. Similarly, it is hard to design strategies to fit this diversity.
- The techniques necessary for regionwide promotion can be very expensive and often require specialized talents.
- It is much harder to find matches for people with diverse origins and destinations. Employer-oriented (or home-end) marketing greatly improves the chances of finding a good match because at least one of the destinations is common.
- Distribution is also more complex. For example, fleet maintenance for a regionwide vanpool program is more difficult than for a vanpool program centered on several large employment sites.

Because of these difficulties, most RSAs in the past have emphasized employer-oriented promotion, and have usually spent about 25 per cent of the budget on promotion to the public.

6.4 SELECTING, REACHING, AND CONVINCING THE CONSUMER

The steps required to target or select, reach, and convince the population segments most likely to make the decision to rideshare are: knowing the area and its people, targeting different types of solo drivers, developing incentives and programs, and conveying the message.

The process can lead to carpooling, vanpooling, buspooling—or indeed, to the selection of transit or to the conclusion that ridesharing is not feasible for the given individual. The sections that follow outline the process and then draw heavily on the study upon which this manual is based (the 4-cities study) to provide illustration.

6.4.1 Knowing the Area and Its People

The full process of knowing a local population requires knowing and understanding the:

- Transportation needs of the area.
- Current transportation practices in the area.
- Local attitudes toward ridesharing.
- Attitudes toward the several transportation variables critical to ridesharing (cost, hassle, etc.).
- The lifestyle of the people and how it affects their transportation decisions.

Learning who lives in the area is a critical early step, closely related to assessing the transportation needs. Indeed who lives in the area determines the transportation demand. The amount of effort devoted to the task is subject to budgetary restrictions and cost/benefit considerations, but the task should not be ignored or underestimated at any time. Several steps are required.

1. *Mapping the area* (map overlay capability will be useful)—This calls for several types of maps including:
 - a. Population location and population density.
 - b. Overall current traffic volumes at various hours and estimated operating speeds for commuter traffic.

- c. Maps pinpointing transportation congestion areas.
- d. A breakdown of the population by income level (this may sometimes be achieved with home assessment levels or rental levels).
- e. Public transportation maps and peak-period ridership data.
- f. Significant shopping areas and parking areas (formal and informal).

2. *Survey*—Basic information can be obtained by meeting with knowledgeable local transportation, police and other officials, employers and businessmen. The use of small group meetings with commuters (e.g., decision analysis panels or focus groups) will provide considerable information about current conditions and future options. It can help frame a survey if that is part of the plan.

Surveying the area will yield information vital to the subsequent tasks of locating the best target populations. Surveys can be long and intensive or relatively brief. They can make use of telephone or mail, but the most effective survey is a face-to-face contact by a well-trained interviewer. The trade-off between validity and utility of the data and the number of interviews per unit cost must be made.

Sampling is a very important aspect of data collection. Whether you are talking to employers, meeting with decision analysis panel groups, or doing a formal survey of an area, it is necessary that you examine a good cross section of the population. This can be done by random sampling, if a large enough response to represent the community can be obtained, or by a stratified sample. Simply stated, this means obtaining a smaller number of interviews selected from the several representative segments of the community. The choice will depend on access to commuters, funds and personnel available, and preexisting information from available sources.

Information from employers, prior surveys, decision analysis panels, and census data can be employed to focus the process even more. On the basis of prior knowledge, it is possible to disaggregate the population prior to the survey. This permits concentrating on likely target groups and eliminating others from consideration. The development of impressions or hypotheses about the population and their transportation behavior permits deciding which variables to study and what questions to ask before the survey, thus increasing the efficiency of the survey process.

Information sought should range from obvious demographic data concerning length of commute and the number of cars available to drivers in the family, to sensitive assessment of attitudes toward the several alternative modes, to tradeoffs between advantages and disadvantages of each. The logistic requirements for the individual should also be learned (e.g., drop and pick up young child, or shopping). A basic bit of information to be obtained is “Does this driver have to drive alone?” and “Why does this driver choose to?” The response to these questions will help to select, or target, those population segments most ready to accept ridesharing and those most resistant to the mode. An example of such a survey can be found in the 4-cities study (3).

What kinds of information will you obtain: You will have several kinds of information. Some of it is universal or enduring over space and time. If it is valid, it is likely to remain valid (e.g., although there are differences in degree, the several populations studied demonstrated a universal prefer-

ence for knowing as much as possible about potential ridesharing mates before agreeing to join pools). The preference for personalized matching is a universal or prevalent finding. Equally illustrative is the universal intolerance of traffic congestion. Over a 5-year span, in all population segments, a very sizable percentage of the respondents to the authors' urban and suburban surveys, when asked "What is your major commuting problem?" replied with some form of traffic congestion. This universal information will be true for any urban or suburban area and probably for the foreseeable future.

Other information will be less general in its application and helps to divide the area geographically or occupationally. (For example, the lowest end of the economic scale with fewer reliable cars per capita is very likely to be amenable to ridesharing if no major obstacles exist. On the other hand, physicians, professionals, real estate salesmen, and others whose work requires a car are unlikely to respond.) These are the extremes of the spectrum. At one end economic necessity prevails, at the other occupational demands.

As a further illustration, the four cities studied in this research are significantly different from each other in the use of flex-time. With a national average of 28.8 percent, 38.6 percent of Houston respondents work flex-time while in decreasing order Albany 30.9 percent, Minneapolis 26.9 percent, and San Francisco 19.4 percent. Such differences can have a profound effect on the readiness for ridesharing and the nature of the ridesharing program developed.

Many findings change over time providing clues to the vectors affecting commuter decision-making. In a study in 1975 (4), cost factors were included among commute problems, but not rated high. In 1980, cost had risen to rival traffic congestion in importance to commuters. Such findings are important because a change in the factors affecting the respondents (e.g., increase in the price of fuel or "hassle" in obtaining it) is likely to have a greater impact than a steady-state factor like congestion, no matter how burdensome it is.

Chapter Four discussed some of the information obtained by survey and decision analysis panels that reveals the character of the population for planning purposes. As the program progresses and reaches into new, and more resistant, populations, a number of research findings will be of assistance. A summary of the key findings for the population of the 4-cities study as a whole is in Chapter One of these guidelines. It includes both demographic and attitudinal results. A summary by metropolitan area and for specific target groups can be found in Appendix D.

6.4.2 Targeting Solo Drivers

What do we mean by targeting? Simply the efficient selection of various specific subgroups from among the population of solo drivers. A useful illustration may be garnered from the world of communication in which researchers learned that 10 percent of the nonbusiness telephone users generate 49 percent of the residential long-distance traffic. That target is obvious. Because there is not competition for market shares with other efficient modes such as mass transit, targeting for ridesharing requires selecting specific solo driver groups.

The simplest selection basis is *stated interest* in ridesharing. In the 4-cities study, for example, the question "How interested are you in vanpooling to work now?" was asked.

Although 37.3 percent of the total sample responded affirmatively, the following geographic differences were highly significant (0.01 level):

Houston: 42.9%
 Minneapolis: 37.5%
 San Francisco: 34.8%
 Albany: 34.2%

Greater differences were elicited by occupation group. These were very highly significant (at the 0.0001 level):

White collar workers: 42.3%
 Blue collar workers: 37.2%
 Managerial, executive, professional (MEP) workers: 32.5%

These findings suggest that white collar and blue collar workers may be more responsive to vanpool campaigns than MEP personnel. The same response pattern resulted for stated interest in carpooling.

Nevertheless, in the 4 cities studied, both carpool and vanpool campaigns appear to have been directed more heavily toward MEP workers. In response to "Have you ever been exposed to a carpooling (or vanpooling) campaign?" the following response pattern resulted:

	Blue Collar (%)	White Collar (%)	MEP (%)
Carpool campaign	22.5	35.1	48.6
Vanpool campaign	21.7	23.7	37.5

Thus, targeting for such programs appears to have been misdirected when these findings are compared with "interest in ridesharing" responses presented immediately above. It will be important for RSAs to investigate if similar patterns occur in their locales.

A further breakdown within occupation types should yield an even more refined basis for selection of subgroups for targeting.

A second criterion for selection may be whether the solo driver has to drive alone. Which perceive themselves unable, for real or other reasons, to ride with others?

In the 4-cities study, four questions were addressed to why people were unable to rideshare. They included:

1. The use of one's car for work purposes during the day.
2. The use of one's car for personal errands during the day.
3. Having a car available before arriving home at the end of the workday.
4. Perceptions of availability of alternatives to solo driving.

Work-related errands were reported as occurring on the average 1.96 times a week. The average number of personal errands for which the car was used, during lunch hour or on the way to or from work, was a little higher: 2.1 times. Some segment of the commuter population studied is evidently much attached, for whatever reasons, to having the use of their cars before arriving home after work: more than half (53.1 percent) said that if they were going to carpool or van-

pool, they would prefer to drive to a safe park-and-ride lot to do so in order to have the car available at the end of the workday to run errands, meet friends, etc. This finding is in startling contrast to the general dislike of two-mode trips, and indicates potential for ridesharing in a large number of solo drivers, if their needs and priorities can be met.

In summary, the total noncommuting use of the car on workdays, adding business and personal use, amounts to an average of more than four times a week. For some population segments it may represent opportunities taken rather than necessities. (The managerial/executive/professional group accounts for the main part of business use of the car during the day, and yet they are also the group with the most extensive ridesharing experience.) Clearly for others, such as the working mothers of young children, diverse responsibilities and crowded schedules do absolutely require running errands before reaching home at night.

Finally, it must be said that you "have" to drive alone to work if you do not see that you have any other options. All the solo drivers surveyed lived in suburbs. A little more than half (54 percent) said that there was some other way to get to work (mode unspecified) available to them currently, and a little less than half (46 percent) said that there was not. One would expect that carpooling with at least one other person (as it was defined for these respondents) ought to be available to considerably more than 54 percent. If it is, it did not occur to any really sizable majority of those solo drivers interviewed. This suggests both a problem and an opportunity for ridesharing agencies. The discussions of matching methods, social matters, and harassments perceived in ridesharing will help illuminate this finding. Probably the unfamiliarity of vanpooling also plays a role.

The ability to target more closely will exist in each city. Different orders of criteria for targeting can be investigated:

- Location within a geographical area by origin and destination.
- Distance from work.
- Availability of parking at work end.
- Ratio of commute cost to income level.
- Acceptance of ridesharing as a preferred tradeoff over other transportation options and their problems.

The last is well illustrated by the responsiveness of specific commute subgroups to the potential of ridesharing for overcoming transportation problems, for example, the hassle and cost of service station stops for fuel. In the population of the 4-cities study in 1980 men (68.9 percent) were significantly ($p = 0.01$) more interested than women (58.5 percent) in "leaving a few minutes earlier in the morning to meet my carpool or vanpool in order to go to service stations less often to buy gas." Travelers with suburb-to-suburb commute patterns were similarly more (68.9 percent) interested in this tradeoff than those who commuted from suburb into a city (59.5 percent, significant at the 0.02 level).

The illustrations that have been offered are relatively generalized for the study of a particular community or urban area. However, the use of overlay maps and multiple criteria can assist the program planner in narrowing his attention to the subgroups most amenable to his campaign. It will be noted later that the basis for targeting then becomes a primary element in the message directed to that target audience.

6.4.3 Developing Incentives and Programs

It has been noted that cost considerations have become increasingly important to commuters over the last half of the 1970s. This has not made ridesharers of even a major fraction of those expressing the concern. Most commuters are not yet willing to sacrifice time, perceived reliability, privacy, or social comfort in order to save money. Ridesharing can reduce costs, but the research reveals that while such reductions may be necessary, they are not sufficient. RSAs must take steps to reduce social discomfort in matching, educate concerning actual time and reliability costs (if any) of ridesharing, and even provide the more private vanpool conditions for those who want privacy. Positive incentives can be introduced, such as the interest in meeting desirable new people. This is especially true in areas of high mobility. The requirement is knowing the audience to which we address the program: their needs, their fears, and their potential for changing from solo driving to ridesharing. With this information, we can shape the developing program and meet the needs of each group as we target them for the ridesharing campaign, and reach out to them via the media, employers, coordinators, etc.

The motivation of solo drivers to consider and then to accept ridesharing depends on the ability to offer a mixture of transportation options, economic costs, and psychological and sociological conditions that will outweigh the benefits, both tangible and psychological, that they get from driving alone. If the assessment of the population is adequate, the RSA will have been able to select populations (subgroups) of solo drivers to whom it can offer a *ride-sharing option that can get them to work and home on time, at lower cost, having the opportunity to run needed errands, without the hassle that they dislike and with the augmentation (certainly not the loss) of personal and social status or the feeling of security that they require.*

A wide range of incentives can be employed in ridesharing programs. Economic incentives (i.e., reduction of cost) are likely to become stronger motivators. They range from highlighting the savings implicit in sharing the costs of commuting to outright subsidies to vanpools or buspools that are also beneficial to the employer or governmental unit.

Response to the 4-cities study (1980) revealed that 62.3 percent of the population sampled would be likely to ride-share if the price of gasoline reached \$1.75 in the next 12 months, 69.1 percent if it reached \$2.00, and 73.2 percent if it reached \$2.50. Although these are "direction of sentiment indicators" and cannot be expected to be actual predictions, they do indicate the significance of dollar cost of fuel and suggest a basis for timing of your targeting of specific population groups.

Seventy-six percent of the respondents stated that one of the very good things about vanpooling is that a lot of auto repairs are avoided. Sixty-four percent would rather leave a few minutes early in the morning to meet a pool and go to service stations less often to buy gas. There is further evidence to support the outright incentive value of dollar cost coupled with reduced hassle. However, as qualifications are suggested, the power of reduced dollar cost as an incentive diminishes. Thus, (1) when the need to run errands is balanced against cost savings only 49.7 percent feel the savings are worthwhile; (2) dollar savings were worth "depending on other" to only 42.3 percent of the respondents; (3) the pos-

sibility of having to “wait for late carpool members” reduced the potential acceptors to 33.7 percent.

Although the incentive value of dollar cost to drivers must be included in planning, it may not be sufficient to convince those one hopes to recruit. It should be noted that men are more willing to leave early to save money than women. Women are also more likely than men to prefer the use of their cars to run errands than save money on fuel and parking. It is likely that family role produces the differences. However, the differences are likely to be meaningful in developing incentives, as well as in targeting. Men are also more interested in avoiding repairs by vanpooling. Blue collar workers closely followed by white collar workers are more responsive to economic incentives than managerial personnel, an unsurprising but important finding.

What other incentives are important? The 4-cities study has isolated a number of factors in addition to cost that influence commuter interest in ridesharing. These include:

1. **Freedom from “hassle”**—Harassments, irritations, or unexpected problems that occur in relation to one’s commute to work. These range from the annoyance of having to take a vehicle in for repairs, to having to buy gas frequently or wait in line, to perceiving ridesharing as difficult to arrange, to finding a given mode not relaxing, to having to find another way to get to work if you miss your vanpool.

2. **The matching process and other social issues (social aspects)**—Includes items that address the interactions between people in a pool, such as how easy it is to choose whether or not to socialize, whose company one would want to keep, and whether companionship during the commute is viewed as a pleasant thing in general. Because the matching process addresses a matter perceived by commuters as social, it is included here: how well one would want to be acquainted in advance before making a pooling commitment, how well the various matching methods would serve this need, etc. (Note that the matching process questions also address the issue of how much help is wanted in the matching process.)

3. **Parking**—Addresses parking privileges for poolers as an incentive, and the importance of guaranteed parking at work.

4. **Mastery**—Involves the degree to which the solo driver will insist on having some control over the experience of the commute (e.g., how important being able to do the driving may be, how unpleasant the prospect of vanpooling is because some one else sets the rules and times).

5. **Convenience**—A small cluster of items relating to space for packages during the commute and the convenience of being able to have transportation for personal purposes before arriving home. Convenience has been used in other studies as a euphemism for hassle, social factors, and time. These have been distilled out as independent items.

6. **Status**—Addresses issues of concerns for maintaining one’s status, or sense of place in society in the commute. Items include, for example, embarrassment in front of colleagues at having to excuse oneself to meet a pool, preferences for pooling with people at a similar station in life (defined as at a similar job level), etc.

7. **Time**—Specifically defined here as the perceived time it takes to commute, or to take care of the immediate neces-

sities to commute such as buying gas. An example is the interest in HOV lanes if one were to rideshare because that speeds the commute time considerably.

8. **Independence**—While mastery issues relate to controlling the experience of the commute, independence is used in the special sense of how free one is of having to depend on other personally known individuals on a daily basis. Items are asked specifically in terms of having to depend on other people and more generally concerning needing to leave work at a fixed time each day because one has to depend on other people for the commute. Total independence on a daily basis is only achieved by solo driving, walking, cycling, or public transportation.

9. **Safety**—Includes both safety from assault and from accidents.

10. **Comfort**—Here means only physical, as opposed to psychological, comfort, and relates to crowding within vehicles during the commute, and the physical comfort of certain vehicles (e.g., whether a car is perceived as more comfortable than a passenger van).

Each of the incentives described will have different impacts on the various segments in any population. The significant incentives may change over time (e.g., assurances of the reliability of a mode or cost savings may bring someone into ridesharing, but social factors or convenience may keep others in the pool). It is therefore important, at best, to stay in touch with the factors currently motivating the acceptance of ridesharing and to pay close attention to any decline in response from specific segments or decline in the effectiveness of a given incentive. Such a reduction of impact may derive from a change in the climate of opinion, or mean that most of those affected by the incentive have been reached. In any case the reasons should be investigated and new or improved incentives substituted.

A program must be developed that can deliver these incentives effectively. If the incentive is social and match related (i.e., personalization), a staff that can implement such personalization efficiently, promptly, and convincingly is essential.

6.4.4 Conveying the Message—Outreach

A number of methods for reaching the prospective ridesharer exist. The methods should be selected because of their efficiency in carrying the required message to the selected target audiences in a manner that not only produces name or concept recognition but also increases the receptivity of the audience to the program offered. Methods of communicating vary in a number of ways. Some (like radio or network television) reach a wide range of individuals, while others reach a selected population (e.g., a PTA or civic association). Some are impersonal and abstract, while others are personal and addressed to the individual. Some channels are directed only to the audience, while others permit a dialogue. Useful channels of communication are timely—examples include rush-hour radio or road signs that take advantage of feelings about congestion. The media can be used to reach large populations or can be as focused as a neighborhood newsletter. (Chapter Eight discusses such new media for ridesharing as low-power radio and television.)

Types of outreach include the following:

1. Many populations can best be reached through access to key groups or institutions important to that population. Unions, civic associations, PTA's, religious congregations, and so on, all have a significant influence on the individual and family. It is also significant that meetings are a timely situation in which to introduce ridesharing because potential ridesharing mates may be in the audience and it provides an opportunity for consideration, for appraisal, and perhaps for group formation.

2. Print media and graphics—mailings, road signs, cafeteria posters—are examples of visual methods of reaching people. A disadvantage is that mail regarded as "junk" is easily discarded and road signs ignored. This can be in part overcome by the skill of the graphics expert and the power of the message in the right setting. (See Appendix B for examples.) However, printed materials have the advantage of being more enduring than auditory stimuli. Research has demonstrated the more lasting impact of something that can be reread at leisure and passed around.

3. Messages should be short and brisk, but compelling. They should indicate the value of ridesharing to the audience rather than some abstract or remote benefit. They should maintain or improve travelers' images of themselves should they rideshare. And they should be supported by consistency with the value system of receivers, or of persons or groups by which receivers judge themselves (reference groups). Where possible, they should be delivered by an appropriate messenger or medium of significance to the audience. For this reason, the employer or community leader is a valuable ally.

4. Reaching potential ridesharers through the worksite involves assistance from personnel or other administrative personnel in the company. It requires a carefully planned campaign appropriate to the needs of the employees and employers. This is discussed in Section 6.1.1. It may also be achieved through ridesharing personnel (coordinators) in the work area. This is particularly useful where a number of small and intermediate-sized employers are close to each other geographically. Employer cooperation or acquiescence are also required. The level of employer enthusiasm is often reflected by the employees.

5. The coordinator is the agent of outreach. The function of the coordinator would be to induce new pooling and to expand and maintain established networks. The coordinator would find and have exploratory meetings with potential carpoolers to study what they consider to be most important and to develop criteria for carpooling within the organization. They also would plan familiarization meetings for carpool applicants who share common origins and destinations as well as personal characteristics and present options for carpool mates.

Coordinators can be available to hear problems and help reform carpools encountering logistic, organizational or social problems, and provide "emergency service" by assigning people temporarily to other carpools when drivers are not available or the member has to work late. They are particularly useful to help form emergency pools during periods of snow, fuel shortages, or emergencies. In general, the coordinator could initiate and help to carry out a wide variety of strategies designed to meet the personal needs of commuters, whether at the work or home-end. The coordinator's

role as a continuing evaluator and problem solver will probably be the most sensitive, up-to-date, and inexpensive aspect of your own intelligence and feedback system.

6. Other types of outreach can be devised for special situations. The "welcome wagon" is an old and effective institution in some communities, and can carry a ridesharing message. New worker orientations are common in most companies and printed materials or vital suggestions to new employees who have not yet settled their community arrangements. In general, the RSA director should be sensitive to new material dealing with the acceptance of innovation. This is the "bread and butter" of the program.

7. The public promotional techniques used to date to support marketing by RSAs are shown in Figure 8:

Almost all RSAs have made use of donated public service announcements or paid advertising on television and radio, in addition to editorial, news, or special programming. This can be a relatively expensive promotional technique, as noted in Chapter Four, because broadcast material should be professionally prepared if it is to have a motivational impact. However, television spots can be produced inexpensively by preparing an announcer script, submitted along with one (or several) color slides showing the RSA name and telephone number. These will provide information and recognition. Similarly, a good but inexpensive radio spot could consist of scripts for live announcement by the disc jockey or program host.

Ridesharing is of interest to the media these days because it is politically topical; it has good potential for "human interest" stories; and it ties into other newsworthy subjects, including energy, air pollution, public transportation, lifestyle changes, local business and community actions, etc. It is important to make the RSA familiar to the media, so that when an opportune moment arrives they will report on ridesharing, referring to the RSA as the place to go for help; call on the RSA for related stories when a relevant issue comes up (e.g. congestion, pollution, energy); and use the RSA's public service announcements (PSAs) because the public service director is educated about the importance of ridesharing. The more the RSA helps the media with their job, the more they will help the RSA.

Public service announcements (PSAs) often are not broadcast during prime time or even commuting time. Special programming, news spots, and editorials are far more desirable than PSAs but are more difficult to arrange for and produce. Transportation crises can present an excellent opportunity, if the RSA has prepared for such possibilities. Also, chances for good air time are improved if you time the release of your publicity events, news releases, and such for "quiet news time." This will vary locally, but Sundays and Monday mornings are usually good. Inquire about such opportunities when you visit the station directors.

Substantial coverage in newspapers has been gained in the past by many RSAs. This has included mostly feature articles and editorials rather than advertisements.

A better focused promotional technique includes use of billboards and highway signs. Billboard space rental is often donated, but you will often have to pay for copy design and printing (typically in 1979 \$1,000 to \$2,000) and posting (\$30 to \$50 per board, 1979). Highway signs are usually posted by the highway department at cost and have proven to be a very cost-effective technique for generating inquiries. They are an

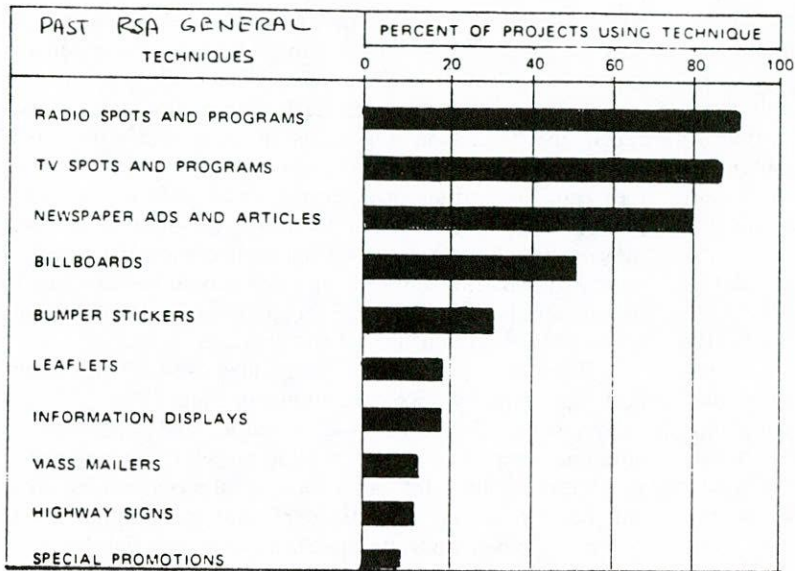


Figure 8. Past RSA general public promotional techniques. (Source: Ref. (2))

excellent example of a promotional technique well-targeted to a particular market segment: the longer distance commuters who are attracted to freeways and highways. Location of billboards and highway signs is important. For example, some good places would be near a special bus/carpool lane, at on-ramps and off-ramps, and near large employment centers where your RSA is active. Location near a congestion point is very valuable. It increases the exposure time and the readiness of the commuter to find an alternative mode. Several highway signs are shown in Figure 9.

Public promotion should be in accord with transportation policy in the area. For example, it may be useful to discuss promotional plans with local transit operators, and perhaps even to have them participate in the planning. The same may be true of other transportation providers in the region, as well as agencies concerned with air pollution and energy.

Developing and executing any mass media promotional activities will generally require more expertise than RSAs have on staff, so outside help should be sought. For publicity-related matters, a "public relations" firm may be appropriate. For advertising and collateral material (literature, etc.), an "advertising agency" may be useful if they understand the nature and objectives of the program. Ridesharing represents a significant change for the individual and frequently for the family. "Hard sell" approaches can be counterproductive. Public information that represents the position of the RSA should therefore be carefully screened by an informed staff member with the authority to direct the activity.

6.5 COORDINATORS—WORK END, HOME END

6.5.1 Overview

As noted earlier, the fundamental function of the coordinator is that of finding, reaching, and communicating with the employer and target audiences. The coordinator's approach to the employer can be modeled on the general approach described in Section 6.1.

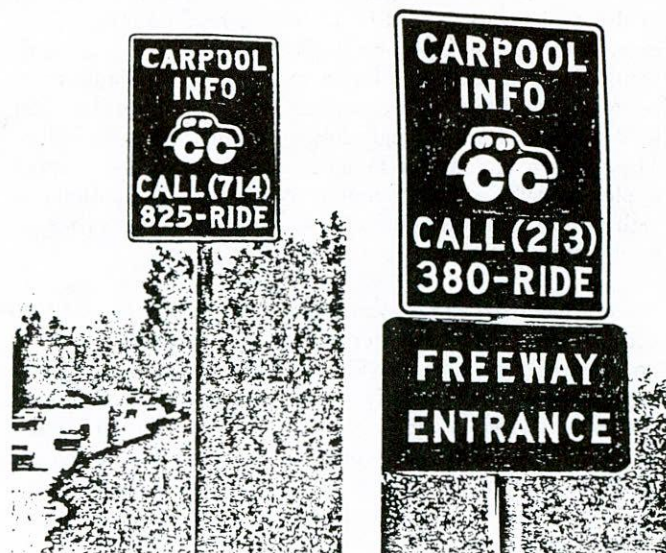
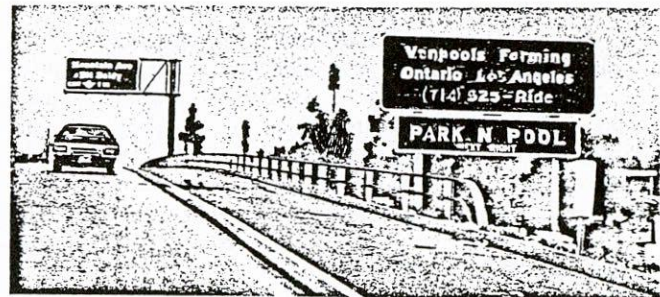


Figure 9. Highway signs.

The task of the home-end coordinator is to reach people who can benefit from ridesharing services but who are not linked by a common employer or employment site. At the home end a somewhat different condition prevails. The neighborhoods are more homogeneous, but the potential ridesharers are more decentralized than at the work end. They come together only on special occasions and even these do not attract all of the subgroups that inhabit that particular geographical area. Nevertheless, the home end has its own advantages. People feel safer when they are in the company of people like themselves. Neighborhoods also provide shorter assembly time and the possibility of extending the commuter pool to nonwork-related travel and/or developing friendships that will ensure the survival of the pool.

As noted, the home end requires a skilled coordinator and the support of the "gatekeepers," those statusful or strategically located individuals who can help the RSA to reach commuters at the home and assist in the acceptance of the innovation of ridesharing. School principals, popular teachers, PTA officers, civic association officers, the clergy and popular public officials are all the kind of people valuable to an RSA's program. Sometimes you will find a natural leader or organizer at a meeting. Another potentially valuable agent is the high school driving instructor. These people have considerable influence on the young person's transportation values in the long run and may reach the whole family through the teenager's conventional crusading and advice to parents. Lastly, the home-end program is not restricted to commuting. Those at home can rideshare to shopping, recreation, and political, civic, and religious activities. (Housewives in Chevy Chase, Maryland, found that they could combine socializing and shopping by driving together to the shopping mall. These activities could be accomplished more efficiently and pleasantly together. These women also learned to save money by making some of their purchases in case lots, thereby cementing the motivation for shared activity (4).)

The convergence points for neighborhoods may be a civic association or a condominium meeting. Parent-teacher associations are notably good meeting points for people who are in an age group when family budgets could benefit from the financial benefits of ridesharing and when leaving the car at home would preclude the need for a second car.

The coordinator should have the capability for understanding the community and the needs of the people in it, including their needs not only for transportation but for friendship and affiliation. This, in turn, requires understanding the values and common bonds that may tie the community together or separate one part from another. The coordinator must also understand the communication patterns and channels as well as which people are the "gatekeepers" or opinion leaders in the community. The coordinator must be able to use this understanding to reach people, appeal to their needs and preferences, and match these in a manner that provides low-cost efficient transportation in a convenient and satisfying manner.

The job description of one coordinator used for work-end ridesharing follows. With some changes it could be used at the home end as well.

6.5.2 Coordinator Job Description

Position Summary: A full or part-time position responsible for

planning, organizing, and directing employee commuting services with the assistance of the local or regional organization which specializes in all modes of commuter transportation.

The Primary Tasks Include: (1) providing ridesharing information and assistance to employees, (2) preparing commuting impact assessment for company management, (3) serving as staff liaison to public and private agencies who contribute to or are affected by commuter transportation.

Qualifications Guide:

- A self-starter, ability to work independently, be organized, and keep track of details
- Gain cooperation of fellow employees and senior management in achieving ridesharing objectives
- Ability in problem solving and analyzing commuting alternatives and data
- Ability to make written and oral presentations and work with teams from various areas to achieve ridesharing objectives.

6.5.3 Tactics

Coordinator tactics must be worked out by the ridesharing director with the coordinators (and perhaps community or employer advisers). The program, including its several services, is tuned by making use of the information the coordinator has about the community. The coordinator learns as much as possible about the community by *talking to key people*: the pharmacist, service station manager, local government official, elementary school principal, employers, personnel directors, union leaders, parking managers at local industrial plants, and various other gatekeepers such as PTA officers and editors of company and neighborhood newspapers. Coordinators would be well advised to meet as well with informal groups of potential ridesharers such as late teenagers in high schools and colleges, and employees (as introduced in 6.1.3 and discussed in Section 6.6).

In seeking information or discussing ridesharing, the RSA should not appeal to altruism, patriotism, nor come as a supplicant. The visit is to obtain information or cooperation in improving the transportation, parking or quality of life for industry, individuals, and the community. The RSA is offering a service. The approach must be constructive and positive. Discussion of current conditions as they affect the individual and family or business unit is likely to be heard and accepted. An orientation to ridesharing should be provided; there are many myths and misconceptions. This effort to elicit audience participation, even their recommendations, should help in learning more about the needs, attitudes, and resistance of the specific audience. From these, appropriate economic, social, security-maintaining or hassle-minimizing benefits can be pinpointed.

There are a number of methods with which a coordinator can experiment to engage people in accepting the innovations of ridesharing. One step is to *get people to engage in a first cooperative venture*. It may be a one-time rideshare if it is not possible to achieve a regular or daily or multi-weekly ridesharing pool. Even the experience of shopping carpools or carpools to an athletic event or the PTA meetings can be profitable first cooperative adventures. The New York State DOT Home End Coordinator Project, for example, is currently developing a buspool from a single community to a nearby college, both as a service and an introduction to ridesharing.

A coordinator could approach a PTA meeting with "I noticed the number of cars outside and it is almost a one-to-one

ratio with the number of people or couples here. Had you thought about getting together to come to the meeting? This might help with fears about going out at night in the winter, and it might very well help with fuel costs and the wearing effect of a short drive on your car. Probably the motor doesn't get warm before you get to the school. We can all share over the semester the process of driving to the PTA meeting and to other meetings." Such carpooling may be relatively unproductive in actual energy saving, but it can start the first cooperative adventure. The effort may even appeal to the PTA leadership: when members are committed to drive to the meeting together, attendance is likely to improve and be more reliable.

Coordinators will find that, where possible, it is *easier to work with homogeneous groups*. They have comparable problems and objectives and are more likely to be interested in the comments of other members of the group. They are more likely to trust and feel comfortable with each other and eventually to develop a consensus or "bandwagon effect."

Current ridesharers who are well known and trusted members of the communities *can also be helpful* in creating consensus. They can be helpful to their friends by recruiting them into their own or new pools. Note that the growth of ridesharing in their community will validate and reinforce their own behavior. A process of benign contagion should be the objective.

Familiarization—concern about calling strangers and about committing oneself to riding with them has been found to be a major barrier to the acceptance of ridesharing. Several techniques are available to the coordinator that may ease such anxiety and remove this barrier to ridesharing.

The simplest technique has been used by employer coordinators at the work site and by home-end coordinators at meetings of homogenous groups. The coordinator or other group leader suggests that people sort themselves out on the basis of origin-destination and a natural selection process. The potential of face-to-face meetings of homogeneous groups to discuss ridesharing was apparent during several sequences of data collection in both 1975 and 1980 by the authors. During decision analysis panel meetings, employees got to know each other's transportation situations and in a number of cases formed carpools during or immediately after the meetings.

The Knoxville Brokerage program made use of an inexpensive conference call maker. This device permitted the coordinator to assemble a likely group for ridesharing from his list of applicants and then call each until he had a conference call with three or four people. The coordinator then provided them with some orientation and an opportunity to interact. This familiarization process is less expensive and more convenient for all; is less coercive in that it is easier to say no under these conditions than in face-to-face interaction; and offers ample opportunity for people to ask questions, express reservations, and achieve a consensus.

The familiarization process can take many forms. The prime requirement is that it ease communication and increase the trust of each applicant for other applicants and for the ridesharing program (i.e., that there will be good ridesharing opportunities with people with whom the applicants can feel comfortable). It is made clear that applicants will have some information about—and therefore control over—the decision to join a given group. In many cases the trust is en-

hanced by confidence in the coordinator or employer under whose auspices the program is conducted. Familiarization is an essential component of the personalized approach detailed in Section 3.2.

A detailed account of one employer's ridesharing coordinator program with personalized matching follows.

6.5.4 A Case Study—The Livermore Laboratory Ridesharing Coordinator Program

6.5.4.1 Coordinator

The key to the success of the Livermore Laboratory program is a skilled in-house ridesharing coordinator with a staff of two who facilitate the group process of ridesharing. Promotion is based on providing information on ridesharing opportunities to new employees during their initial orientation meeting—or earlier if the new employee asks about transportation prior to employment. They are informed of all the transit service to the Laboratory as well as of company carpools, vanpools, commuter buses, and bicycle repair service. In essence, the Laboratory really has a full-range ridesharing brokerage program. The staff is called LabTrans, short for Laboratory Transportation Coordination Office. Its main achievements are:

- Three-quarters of Livermore ridesharing applicants are placed within a week. A coordinator is designated for each existing pool as the contact point for added applicants. The applicant and coordinator are given each other's number, and the coordinator will call the applicant if that person has not been heard from.
- In the first 3 years of the program, ridesharing has grown from 12 percent to 42 percent as the staff has increased from 6,200 to 6,800.

PROGRAM YEARS	CARPOOLS (%)	VANPOOLS (%)	COMMUTER BUSES (%)	TRANSIT (%)	TOTAL (%)
1977	5.6	0.2	5.4	0.9	12.1
1980	23.3	10.7	4.0	3.9	41.9

Space for ridesharing applicants is first sought in existing pools rather than by forming new ones. To do this, the ridesharing coordinator collects the following data for each carpool and vanpool:

- Name and telephone number of the driver or pool coordinator.
- Geographic origin of the pool.
- Driving schedule.
- Whether pool is smoking or nonsmoking.
- Capacity and present number of members.

These data are computerized for ready access and updating, as well as to facilitate rapid expansion of ridesharing in case of fuel shortages. The Laboratory's goal is to be able to double the number of ridesharers quickly in case of need.

6.5.4.2 Carpools

If a large number of pools exists in a community, they are

mapped on a grid to pinpoint their origins. For carpools, this information is collected through both requested feedback from pool coordinators and regular reregistration. To obtain permits for close-in, reserved (until 9:30 a.m.) parking, carpools must reregister every 3 months for the first year following initial registration. After this first year, the carpool is eligible for the "Four Seasons Club" and needs to reregister only once per year—although notification of vacancies is requested when they occur.

Clients who cannot be placed in operating pools are added to the carpool data base as a carpool of the given capacity, origin and work hours, but with a current occupancy of one. Although close-in parking privileges are not extended to this pool, it is otherwise treated like larger pools for placement of prospective riders. In this way, Livermore shifts from the normally passive placement approach (exchange of match lists) to an active approach (referral of prospective riders).

One of Livermore's goals is to create larger, more stable carpools from smaller, two-person pools. To facilitate this consolidation, each carpool coordinator receives a quarterly list of all operating pools within his Zip code area and a cover letter suggesting any consolidations that seem worth pursuing.

6.5.4.3 Vanpools

Placement in the Laboratory's vanpools is similar, but additional data are kept on vanpools and the process of starting one is more complex. The additional data supplied for each vanpool are:

- Pickup points and times and the route followed.
- Company parking space (permanently assigned).
- Capacity of pool.
- Fare for each pickup point.

Vanpool applicants are screened more carefully than carpool applicants to ensure compatibility with any existing vanpool. The prospective pooler makes a commitment by putting down a \$25 seat deposit or the first month's fare. For new members joining operating pools, the monthly fare is pro-rated and paid on the first day of service.

Because the number of would-be carpools outstrips the supply of operating vanpools, applicants are placed on waiting lists for their respective areas. When the number of applicants in an area reaches 7 (one-half of a full van), the ridesharing coordinator contacts all nonpooling employees in the area to tell them a new vanpool may be forming. If enough people are interested, a meeting is arranged in which they work out acceptable conditions for starting up—such as fare level, number of persons in the van, and pickup points—and commit themselves with the \$25 deposit. The minimum number of riders to start the pool is up to pool members, but is usually at least 12 plus the driver. Barring delay to recruit more riders, the driver then arranges the van financing—usually a 100 percent, 5-year loan—with the support of a vanpooling market assessment for the route that is performed for the driver and the lending agency by the ridesharing coordinator. After purchase of the van and insurance, operations can begin. Because there is a substantial financial advantage to the owner-driver to keep the van as

full as desired, van drivers tend to report vacancies without the formal procedures used for carpools.

The role of the ridesharing coordinator in this process is to supply whatever is needed to bring or keep pools together. That could be reducing conflicts within pools or negotiating more riders, a driver, or assistance with van financing.

Most of the present 55 Livermore Laboratory vans are owner-operated, but the 16 leased RIDES vans with which the program began are still in use and in demand, partly because their monthly costs are now close to those of the new owner-operated vans. However, new RIDES vans would cost about \$10 more per rider per month, depending on occupancy and trip distance (see Table 11 for details). Drivers are advised to set a monthly fare based on average ridership expected for the year, with a December rebate if ridership exceeds expectations.

A used van has been purchased for backup use by 30 members of the Livermore Vanpoolers Association, a group set up to serve the mutual interests of lab vanpoolers. Participating vanpools pay \$7 per month, about \$0.50 per rider, toward loan amortization and other annual costs of the backup van, plus \$0.15 per mile for their own use of the van. As participation approaches 60 vans, purchase of a second backup van will be considered. The present backup van is in use only about one day a week, but most vans are still young.

6.5.4.4 Route Consolidation

As the density of carpools and vanpools serving an area increases, improvements in vehicle routing are suggested by the ridesharing coordinator to minimize pickup time. (For example, when a second vanpool is added to a residential area, more efficient pickups may result from assigning some members of the existing pool to the new pool, and vice versa.) A fare averaging system by area is used to reduce the incentives for riders to change pools, or not to change pools, on cost considerations alone. The fare averaging system works by side payments from drivers of older vans to those of newer vans to cover differences in financing costs.

Pools are willing to fare-average because of the prospective benefits from route improvements. For example, one benefit of the route consolidation process has been more home pickups by vanpools in place of central pickups that require driving or dropoffs for the poolers to get to their meeting places. This further reduces the need for commuting vehicles and extra driving time and cost by affected pool members.

6.5.4.5 Commuter Buses

Placement of applicants in commuter buses is made in the same manner as for carpools and vanpools, by identifying vacancies in convenient routes. A private carrier provides the service, which declined from 9 coaches with 336 passengers in 1977 to 6 coaches operated full with 270 passengers in 1980 as three partially full coaches were replaced by vanpools. Rates are currently below vanpool rates, but increases to at least vanpool levels will probably be requested of the state Public Utilities Commission. A leased or club bus arrangement, which would avoid PUC regulation and transfer the main administrative burden to the riders, has been discussed with the carrier but does not appear imminent.

6.5.4.6 Transit Service

In 1977, the Laboratory was served by only one morning and evening bus route by AC Transit, the regional bus operator. As a result of negotiations with AC Transit, three additional routes have been added, and all four are filled to capacity. Also, the local Livermore bus system was persuaded to extend its service to the Laboratory, with similarly successful results.

6.5.4.7 Bicyclists and Walkers

Improvements in the convenience and safety of bicycle and pedestrian access to the Laboratory have been successfully sought from local governments by the ridesharing coordinator, and free repair of bicycle flats is offered by the staff that maintains the Laboratory's own bicycle fleet, used for trips between buildings. Laboratory showers have also been made available in the morning for bikers and walkers.

6.5.4.8 Placement vs. Matching

The Laboratory ridesharing program is based on the concept of "placement" of applicants in existing pools, wherever possible, rather than "matching." In addition, operating pools are tracked to identify vacancies, in contrast to the usual RSA system that tracks and matches riders. It may be that RSA effectiveness could be improved by adopting such tactics, but there is as yet no operating experience to support this premise. Two prospective advantages are the perceived attractiveness to new ridesharers of joining an existing pool rather than joining several strangers, and facilitating pool maintenance efforts (prolonging their life by prompt replacement of dropouts and efforts to increase their size).

6.6 MATCHING

6.6.1 Problems with Impersonal Matching

The original matching method was face-to-face, neighborhood, or work-end contact by individuals. During World War II the government and industry urged more carpooling and transit use and gasoline rationing pushed the process. However, matching was still a hit-and-miss, face-to-face process in which friends, co-workers, and neighbors cooperated.

The new technology and the automation of America greeted the energy crisis with a new solution to gasoline shortages. Computerized matching seemed a simple, cost-effective method of bringing people together. Geocoding provided a basis for grouping people by home end and/or work end. This type of matching is now in use in a number of communities, and it has been effective in achieving an increase in ridesharing.

However, research into resistance to ridesharing has revealed traveler reservations about matching by computer alone. Why such resistance to an apparently efficient method? The answer provides useful insight into the nature of programs. Heretofore efficiency has been considered in terms of the shortest distance between two points: a computer makes more matches faster. The attitudes, fears, and needs of the ultimate consumers have been ignored. To many, the computerization was a barrier; to others, it was a

threat. Among the complaints registered by respondents to surveys and decision analysis panels (4-cities study and Ref. 4) were:

- Too long a delay in response (batch processing).
- Unrealistic matching—use of Zip codes may yield matches that are difficult to reach.
- Resistance to calling a stranger—especially by women.
- Concern about who will be in the pool when choices are unselected (the impersonality of the computer).
- Anxiety that other people may be given access to departure and arrival schedules, either from the list or the computer (information that can be used for housebreaking and other criminal purposes).
- A generalized antipathy to being listed in yet another computer felt by some segment of the population.

In the 4-cities study, active outreach, personalized methods were endorsed by solo drivers; and passive, impersonal methods attracted few. The picture for vanpools was similar.

6.6.2 Personalized Matching

The personalized approach in practice is described by Hekemian and Hershey ("From Concept to Reality," Presentation at Transportation Research Board Meeting, Washington, D.C., January 1981).

The philosophy underlying Maryland National Capital Park and Planning Commission's Share-A-Ride project has been the personalized approach. For many people, sharing a ride involves a personal/social/business relationship that is innately difficult to enter and maintain. By giving proper attention to behavioral factors, the personalized approach helps people overcome certain barriers to carpooling, such as their reluctance to ride with strangers, their perceived loss of independence, or their resistance to rigid and confining commuting arrangements. It also strives to provide reliable and continuous assistance which is not treated as simply a mechanical problem, but rather as an opportunity for person-to-person interaction. . . .

The specifications for the field representative positions require individuals who are experienced and educated in marketing and public relations and possess good record-keeping skills. Their backgrounds enable them to show sensitivity and develop rapport with both employers and employees, and to provide perceptive feedback on marketing strategy and applicant assistance procedures.

The roles of the field representatives are particularly unique and deserve special mention. Since a key principle of the personalized approach is continuous, personalized service from initial contacts with the employers all the way to assistance for their employees, the field representatives have responsibility not only for marketing and promotion, but for matching applicants and making follow-up telephone calls as well. This wide spectrum of tasks adds variety to the job and at the same time promotes accountability. A field representative recognizes that the ability to make good, prompt matches and follow-ups will affect the receptiveness of employers and employees when he or she attempts to market the project further. Moreover, when the field representative matches applicants and makes follow-up telephone calls, he or she is able to explain to applicants the reasoning behind the match-ups. This combination of responsibilities also promotes a self-regulating balance between the contacts with businesses and the processing of applications. Whenever the number of applications decreases, it's a clear signal to a field representative that marketing should increase. Likewise, as applications in-

crease, marketing can become less critical. The net result has been a relatively even flow of applications and a steady workload. . . .

Recent research indicates that many traditional ridesharing projects have had difficulties coaxing a significant percentage of the area's employment force to enter new ridesharing arrangements. It appears that the largeness of the market area and impersonal nature of areawide computerized projects prevent them from appealing to much more than the "self-starters"—those people who are very highly motivated to share a ride with a bare minimum of assistance from a ridesharing project. Share-A-Ride's personalized marketing program, on the other hand, has been designed to dip much deeper into the market to also attract the "undecided"—those people who are only marginally interested in ridesharing, yet who could be convinced to give it a try if personalized assistance were made available. Whereas traditional areawide programs must spread their marketing resources thinly over a wide market area, local projects, like Share-A-Ride, are able to concentrate their resources on a limited area and thus serve their clients thoroughly and well.

In its efforts to influence a greater portion of the market, the Share-A-Ride staff has applied the personalized approach to every major aspect of the marketing program. With its work-end orientation, Share-A-Ride serves individuals who already have several things in common—their work area affiliation, and their problems and needs as commuters. Its marketing campaigns are largely employer-based, thus generating support and active assistance from members of the business community, who essentially become extensions of the Share-A-Ride staff. Moreover, by establishing an office within the Silver Spring CBD, Share-A-Ride creates a visible, accessible "grass-roots" presence in the area and reinforces the fact that this project is uniquely Silver Spring's.

Much of the marketing strategy has been based on findings from focus group interviews, which were held at the beginning of the five-month preparation phase. The purpose of these interviews was to obtain qualitative information on local attitudes toward ridesharing modes, incentives that would be most effective in inducing pooling and transit use, and options for designing a ridesharing program having the most appeal and chance of success in Silver Spring.

Effective personalization depends on an understanding of the issues or factors that are most important to specific subgroups of the population. It requires that the individual be offered a ridesharing opportunity that meets his or her social and psychological requirements as well as economic and transportation needs. People must:

- Feel that this is an option for them.
- Be motivated to call or write for information or assistance in beginning to rideshare because it suits their needs and is attractive for a personal reason.
- Not be impeded from calling either the agency or a potential ridesharing mate because of any factor supporting anxiety, shyness, or fear.
- Not be put in the position of avoiding ridesharing out of concern that they will be matched with others they do not know or care to ride with.
- Be given an opportunity to describe under what conditions and in what setting they want to commute (e.g. no smoking, radio issues, number of other riders in a given sized vehicle, etc.).

People are anxious about whom they will share a ride with. In the 4-cities study, 71 percent of the respondents insisted

that before they would agree to carpool, they would need to meet possible members at least once. The percentage for vanpooling was lower—58 percent, but still significant. In this era of homogeneous neighborhoods, 56 percent said that if they were going to carpool, they would want it to be with someone from their own neighborhood. Fifty-three percent felt the same about a vanpool.

In the effort to learn about the local community, RSAs will need to avoid a taboo that may yield misleading data. People are reluctant to indicate a preference for ridesharing "with people who are at a similar job level to their own." To say so is taboo because it sounds status-conscious or "snobbish"; only one-third of the respondents in the 4-cities study took this position. However in both decision analysis panel discussions and other survey items, the underlying concern about with whom one would share the pool was revealed. (See the 4-cities study summaries in Chapter One and Appendix D for more detail.)

Concern about poolmates can be a product of stress and tension in the geographical area. In cities with rapid demographic change and high levels of social conflict people are more concerned than elsewhere about meeting carpool members before accepting them.

Although the anxiety of the commuter is probably the most urgent subliminal basis for resisting ridesharing, it is by no means the only one. Convenience is often the real or euphemistic reason given for driving alone. People develop a lifestyle and personal preferences that they are unwilling to abandon unless the economic pressure becomes very great or the personal preferences are dealt with in some way. The strong feelings associated with smoking and nonsmoking sections familiar in passenger aircraft are likely to be magnified by the close confines of a car or van. The aversion of some for rock music is matched by the preference of others. Even more basic is the need for some commuters to make stops for necessary errands, while others want to get home as quickly as possible.

The personalized program is able to deal directly with the prevalent desire to control one's environment. It provides potential riders an opportunity to describe under what conditions and in what settings they will be willing to rideshare. Given moderate numbers of applicants it might be possible to provide a person with two or three nonsmoking compatible companions who prefer radio news programs and little conversation at a time cost of no more than 5 minutes. In return, the applicant will save 67 percent to 75 percent of his vehicle operating costs, reduce the fatigue and anxiety of driving, and lower dollar and time costs for auto repair and refueling in a context of people with whom he might very well enjoy passing the 40 to 60 minutes a day of commuting. *Note that in this process the RSA guarantees the sense of control over their transportation behavior* that so many commuters fear losing, a fear that leads to the rejection of the ridesharing option.

There is another positive aspect to personalization that can provide a powerful incentive to ridesharing. We live in a society in which loneliness is more prevalent than we like to admit. The opportunity to make friends piques interest—most people would like to know more people if they could prescribe the kind. The incentive of meeting new people who are "sympathetic" can be used productively in ridesharing campaigns and provides the criterion for good matching. This

does not require a personality inventory. People tend to like people like themselves—those who are in the same position in life, work, interests, age. Effective matching has been based on a wide range of common interests from sports, to similar taste in music, to common professional or social attitudes. These are not frivolous choices. Not only do groups tend to form on such common grounds, they tend to stay together on these bases, producing a group loyalty which will reduce attrition. Even more important is the fact that many groups break up over such issues as the kind of music played on the radio, constant conversation about a subject not of interest to the rider, the feeling that the rider has nothing in common with the others.

Responding to such needs is indeed the message of the personalized program: the desire of the ridesharing agency to provide lower cost, efficient commuting without any significant sacrifice of quality of life. Coordinators are central to this process because, above all, they can provide a human sensitivity to the subtleties of the matching situation and occasionally intervene to improve it. Their presence provides a reassurance to applicants and potential applicants that they are a subject of human concern rather than a statistical unit. RSA promotion activities will generate demand, and this demand must be satisfied in a way that helps create more ridesharing. Whether matching is by hand or computerized, it should represent an effort to bring groups together who are likely to remain together and enjoy it.

The more mechanical aspects of good matching are also basic to the personalization. The next section provides useful guidelines for achieving prompt and efficient response matches.

6.7 PROVIDING THE MATCHING SERVICES

Perhaps the most critical activity of the coordinators will be to establish criteria for matching, engage in actual matching, monitor the matching operation, and engage in familiarization to assure the success of matching.

There are four steps necessary to provide matching services:

1. Receive applications.
2. Process applications.
3. Distribute ridesharing information.
4. Purge obsolete data periodically from files.

These steps are discussed in turn.

The following discussion presumes that normal “batch processing” will be used, as opposed to “on-line” processing. If on-line processing is to be used, customized procedures must be developed to suit the particular computer package being used—and they are all different. Even so, the discussion clarifies the major processing steps for an on-line system as well.

6.7.1 Receive and Process Applications

Applications for assistance will come from three sources: (1) dial-in, via the telephone; (2) mail-in, via mail (or occasionally walk-in); and (3) employer, via the company liaison person, usually. Receiving applications from each of these sources will require a somewhat different procedure:

1. Dial-in applications—This will require at least one trained person, with a good “telephone manner” and perhaps with some multilingual capability, to fill out an application form with information received over the phone. Because a typical application will require at least 2 minutes, it would be best not to use any person who will be subject to many interruptions annoying to the customer. Additional person(s) should be trained and available, if needed.

The person dialing in is likely to have reservations and fears about ridesharing. This initial contact with the RSA is a critical one that may shape the caller’s view of the agency and of ridesharing. The person handling the calls must be accepting, cooperative, reassuring, and above all willing to be of service.

2. Mail-in applications—At most RSAs, this can be handled by the receptionist, if necessary, but preferably by a well-trained staff person. It requires opening letters and perhaps tabulating some information, such as source of the application (e.g., newspaper, displays, etc.). It also requires awareness of the nature of the community and its inhabitants.

If matching response is not to be immediate, it is advisable to respond by mail or phone to reassure the applicant that this material has been received and will be processed promptly. One of the most discouraging problems reported by those interviewed was a long unacknowledged delay in service.

3. Employer applications—For most RSAs, these “company” applications will predominate in numbers. They should be received and logged in by a trained person who is familiar with that company and can handle any unique circumstances (for example, if that batch should be held to wait for another big batch; or, more important, does management policy or different schedules in different departments affect the matching).

Regardless of the specific procedures used for any of the three types of applications, some indicator of the type (source) of the application should be kept through the processing. It will be needed later to “purge” the file and for other reasons.

Applications should also be batched, in some convenient way such as by company or by day of dial-in applications, so that an “audit trail” can be kept as the application moves through the numerous steps that follow. This permits locating specific applications for possible changes, monitoring of performance, and identifies the loss of any applications at any step.

The description of processing is important as a guide to bookkeeping. It is, however, a means to the end of good matching. The discussion presumes computer processing. If manual processing is to be done, essentially all of the processing steps below collapse into one or two manual steps. This should suggest that, where possible, manual matching should be used unless numbers require computerization. This is not only for simplicity but also because manual matching provides greater sensitivity. Throughout this process delays should be avoided. They represent inconvenience and frustration to the applicant. The processing steps are as follows:

1. Scan for completeness—This is not always necessary.

If the error level is typically low, it may be more efficient to let the computer do these checks and examine only the rejects. Until the application form is well “debugged,” a visual scan is desirable.

2. Manual geocode—(See Section 4.8 for explanation of “Geocoding.”) Most RSAs will begin with manual, rather than computerized, geocoding. This will require a trained person to look up each home and work address on a map and make the translation to X–Y coordinates, map square, or whatever will be used by the computer for matching nearby applicants. This will typically take 2 minutes per address for an experienced person. Note that for company applicants, the work address can usually be pregeocoded before the application form is printed and distributed. The resulting savings can be large.

3. Keypunching—Because of the irregular demand patterns, most RSAs will use outside keypunch service. It will be necessary to work with the keypunch vendor to develop clear, detailed instructions for punching the applications. (If the application form is properly designed, it will usually be possible to keypunch directly from it, rather than copying it onto a keypunch form.) Typical costs to keypunch and verify are about \$0.30 in 1979 per (full) card. Be sure to keep a log carefully by batch, including counts of applications sent and received, and cards received. (The computer can usually count the cards for you, but do an approximate visual check—there are about 70 cards per inch.)

4. Computer process—To provide satisfactory response time, computer processing should be done at least once per week. Because computer time is cheapest on weekends, this will often be the best time. Again, a log of what goes out and what comes back should be kept, with the computer doing the counting and staff doing careful visual checks—essential because all computers make some errors. Typical computer costs for carpool matching would be \$0.10 to \$0.50 per match list (1979). (There are no easy rules-of-thumb for other print-outs.)

5. Prepare for distribution—Most computer program packages for ridesharing will sort the printouts (carpool match lists, transit information, etc.) into some convenient order for distribution. For example, all dial-ins would be sorted into home-Zip-code order, although by no means should this be the sole criterion. Zip codes mean little on many commuter routes. At times it is impossible to get from one part of the Zip code area to another; many include totally incompatible neighborhoods. All company-destined print-outs would be sorted by an employer code and perhaps also a sub-code, such as mail stop or room number. If this is so, it will merely be necessary to separate sheets (the data processing jargon is “bursting”), bundle employer printouts by company, and fold and stuff dial-in printouts into envelopes. (The folding, stuffing, sealing, and stamping can be done by machine at “mailing houses.” Typical costs here are about \$0.02 per page.)

6.7.2 Distribute Ridesharing Information

In nonpersonalized programs, this task has been simple. The ridesharing printouts would be mailed to dial-ins and mail-ins (bulk mail and “pre-sort” rates may be available) and delivered to company applicants. (Once again, logs should be kept to monitor performance and solve the inevit-

able problems.) In a personalized program, the coordinator uses the matches to make contacts, usually by phoning good matches. If the RSA is providing computer matching backup to a company or home-end coordinator, the matches would be sent to this person for use in bringing ridesharers together.

6.7.3 Purge Obsolete Data from Files

Ridesharing information on file is outdated quickly. People move to new homes, change jobs, change work schedules, and usually forget to notify the RSA. As a rough rule of thumb, about one-half of any given group of applicants will have significantly inaccurate data on file after 2 years with no contact (51). This is probably too long a period to use data.

In the early years, some RSAs attacked this problem by mailing out “update letters” to all applicants on file for more than a certain length of time with no contact. These letters usually printed the information on file and asked if it was still correct. Most RSAs requested a response even if it was correct.

The results were disappointing. Portland, Los Angeles, and others found that about 20 percent actually respond, another 20 percent of the letters are returned as undeliverable, and about 60 percent did not respond. It was originally felt that most of the nonrespondents had accurate data, and did not feel it necessary to respond. Subsequent studies disproved this notion (51).

The authors learned from their decision analysis studies that delays in response produced disillusion and annoyance on the part of many who initially displayed interest in ridesharing. Quick response is a vital element of any program. It is clear that printing wrong information on carpool lists is certainly nonproductive and is probably counterproductive. Periodic purging of obsolete data is clearly necessary. But what is the best way?

There are at least 7 distinct purge techniques. None is clearly superior. All involve some tradeoff between quantity, quality, and cost.

1. Do nothing (rely on the applicant)—This technique never removes names from the file, so the quantity of names appearing on match lists is high but the quality is low. There is no cost to “perform” this technique. Repeated inability to reach a person appearing on match lists may suggest that the information is no longer current (see item 3).

2. Delete at certain age—If the “cutoff time” is short (say, 6 months), quantity is low but quality is high. With a long cutoff time, the situation is reversed. The cost is negligible.

3. Mailed purge letter—The problem here is the high non-response rate. What should be done about the nonrespondents? If all nonrespondents are assumed to be obsolete and are deleted, quality is high but quantity is low. If nonrespondents are left on file, the situation is reversed. Typical costs are about \$0.25 per name on file (1979).

4. Employer purge letter—This technique distributes the purge letters to company applicants (only) through their employer, and relies on the employer to assure a high response rate (perhaps 70 percent). If the response rate is high, the effects upon match lists are: good quantity, good quality. Costs are low for the RSA but may be unacceptable for the employer. Efficient, low-cost methods for salvaging applications should be explored with the employer.

5. Employer reregistration—This technique deletes everyone from a certain employer and requires that a new application be submitted by those still interested. This would probably produce medium quantity, high quality, and hostile response from most employers. (Some RSAs have done this successfully.)

6. Telephone calls—The RSA calls each applicant to verify information on file. This produces a “response rate” of 100 percent, which will mean match lists with high quantity and high quality. Unfortunately, costs are also high—in the range of \$1 to \$2 per applicant on file (1979). This method, used creatively by staff, may provide good service and more pools and more efficient commuting for some riders.

7. Rank by age—This is a very different approach. This computer program is instructed to print carpool lists with the “youngest” names first and the “oldest” last. If there is an abundance of matches available for an applicant, the older names “fall off” the bottom of the list. If there is a scarcity of names, all are printed. Thus, the quantity is high, the quality is variable (depending on size of each list), and the cost is very low. This feature is included in several of the available computer program packages for ridesharing.

The foregoing purge techniques are summarized in Table 20.

But what is the best purge technique? It seems that “rank by age” should definitely be used, but it is not enough because very few lists are “full.” Also note that the personalized matching techniques described in Section 6.6 include by their nature a highly effective, built-in purge process. This further increases the probability of successful pooling and helps offset the higher costs of personalized matching. All that can be conclusively said at this point is that some combination of techniques is necessary, and the RSA will have to exercise good judgment and creativity to devise the best combination to fit local circumstances.

6.8 A CONSTRUCTIVE PROGRAM OF EVALUATION

Program evaluation has frequently seemed threatening in the past. This occurred when it was intended to find out whether the program was “successful”—and if not, to “blame those responsible.” However, when evaluation is a normal, on-going part of program activity, when the staff itself is active in evaluating the effectiveness of various approaches and strategies for providing ridesharing services, the activity can be constructive rather than threatening. It is essentially a learning process and, under the right conditions, a problem solving process. The brief introduction to evaluation in Section 3.3 could profitably be reviewed prior to proceeding with this section. RSA evaluations need two purposes, which are commonly classified as:

1. Program (performance or summative) evaluation—This is the more common purpose. Funders, the press and others will want to know how many persons have been placed in vanpools and/or carpools.
2. Formative evaluation—The RSA itself should examine the causes of success and failure on a continuous basis, so that they may seek possible changes in policies or practices that might improve future performance.

Table 20. Effects of different purge techniques.

Purge Technique:	Quantity	Quality	Cost
Do nothing (rely on applic.)	High	Low	None
Delete at certain age	Depends	Depends	Low
Mailed purge letter	High	Low	Medium
Employer purge letter	Medium	Medium	Medium??
Employer re-registration	Medium	High	High??
Telephone calls	High	High	High
Rank names by age	High	Varied	Low

Both purposes are valid, necessary, and overlapping. Because ridesharing is a still-developing art, the latter purpose requires equal attention. Even if ridesharing were not new, social conditions and population characteristics often change rapidly. There is much to be learned about ridesharing, and the continuing RSA evaluation provides that learning opportunity.

6.8.1 Summative Evaluation

There are several ways of measuring RSA effort and achievement:

1. Activities and (operating data):
 - a. Number of companies where ridesharing promotions are done.
 - b. Number of employees exposed to ridesharing promotion.
 - c. Number of individuals provided with information.
 - d. Number of applications for matching received and processed.
2. Effectiveness:
 - a. Number of persons placed into ridesharing modes.
 - b. Which modes.
 - c. Average duration in that mode.
3. Transportation impacts:
 - a. Reduction in vehicle-miles traveled (VMT) and reduction in vehicle trips (VT).
 - b. Gasoline and user cost savings, etc.
 - c. Air pollution emission reduction.
4. Cost effectiveness:
 - a. Cost per person placed in a carpool.
 - b. Cost per person placed in a vanpool.
 - c. Cost per vanpool formed.
 - d. Cost per VMT reduced.
 - e. Cost per gallon of fuel saved.
 - f. Program cost per dollar of commuter cost savings (“benefit-cost” ratio).

The ultimate purpose of such summative evaluation is to measure the transportation impacts of the RSA upon the region. However, it is practically impossible to determine impacts from traffic observations and counting cars. The RSA impacts will usually be smaller than the random, day-to-day variations in traffic and mode choice, as well as those due to other active variables. Also, the effects will be highly

dispersed geographically. Thus, different approaches are required. One of these is based on interviews of commuters to find out what effect the RSA has had on their travel habits.

For most RSAs, information measuring their activities, or operating data, will be a normal part of the record-keeping function, and will typically be reported quarterly to funders and other interested parties.

In order to provide summative measures of effectiveness, the RSA can employ periodic (typically annual) surveys of commuters. Characteristics of such surveys are described in the following. A number of other evaluation tools are also described.

6.8.2 Formative (Policy and Practices) Evaluation

The purpose of formative evaluation is to help develop new policies and practices that will improve future RSA efforts. It requires on-going assessment of the operation and impact of the program. In addition, if the RSA has accepted the desirability of a client-awareness orientation, it is essential to back this up with a systematic program to reassess client needs and wants, perceptions, and satisfactions. New ridesharing promotional strategies and services can then be modified when necessary, with improved prospects of success.

How does an RSA go about measuring commuter needs, perceptions, and satisfactions? How do you understand the dynamics of the consumer's decision-making process? How do you assess which program services actually induce ridesharing, which leave it unaffected, and which have negative results? There is no ideal method, but there are several approaches. The evaluation of promotional activities has already been discussed in Section 4.6.

Surveys can be intensive or superficial. Level of need, the skill of the research team and resources available determine the difference: as knowledge of a given population grows, the greater the efficiency of subsequent surveys. For formative evaluation, surveys of applicants, nonapplicants, and the general public can be conducted on a smaller scale more closely associated with new areas being approached.

These surveys can be used to solicit reactions to new services the RSA may consider offering. Care must be exercised here because often a person's words and actions will differ.

Other in-depth studies should also be performed periodically to measure commuter needs and preferences and the frequency with which they change (reliability). Some of the techniques available for doing this are:

- Employer interviews.
- Attitudinal surveys of commuters.
- Small-group data-gathering techniques involving commuters (e.g. decision analysis panels, focus groups).
 - Combining small-group and survey techniques.
 - Tracking demography of housing and employment in your region.
- Coordinator reports—the coordinator is probably your best and most active source of cybernetic evaluation.
 - Analysis of program activities and materials to assure their appropriateness to the information gathered.

These techniques were discussed in detail in Section 4.2, in the context of planning for a new RSA.

6.8.3 On-going Monitoring

Perhaps the best and least expensive procedure is the continuous monitoring of all employer and traveler contacts. A relatively simple record-keeping system can yield useful information on the RSA's experience. A file card on each person contacted can be coded for his demographic characteristics as well as transportation needs and practices. Visible effects of the contact (e.g., application, joining a pool, absolute rejection of ridesharing, etc.) can be maintained by coordinators or other staff. To supplement these data a constant supply of new information can be obtained through a continuing, but low-level, use of decision analysis panels, case studies, and brief surveys given to individual contacts. Periodic large efforts are needed to assure that the measurement process is "on track."

Such a system can reduce the cost of surveys and data processing and produce a continuing input of information. Periodic investigation of the public and unresponsive populations will be needed, but formative evaluation need not depend entirely on regular surveys. Rather, it should be an on-going process leading to on-going program planning.

6.8.4 Survey Methods

Many RSA surveys have been directed only to people who applied for assistance. These surveys measured how many people did join (or did not) a pool as a direct result of RSA assistance. But this is only part of the picture, because there can also be an indirect effect of the RSA's activities. For example, the promotional activities at an employment site will often reach most employees, while less than one-half will apply for assistance. There is evidence that these promotional activities have some indirect effect on those who do not apply; that some of these "nonapplicants" are also induced to rideshare in pools set up independently of the RSA (51). (This is very likely a result of word-of-mouth promotion by commuters.) Whenever possible, RSA evaluation studies should attempt to capture the indirect effects of employer-oriented promotion. There is also limited evidence that mass-media promotion by the RSA may have a similar indirect effect (2). The indirect effects of mass-media promotion are practically impossible to measure accurately under normal budget constraints, but indications can be gained. Even more confusing is the tendency of some respondents to attribute an effect to the media, thus appearing to have made up their own minds independently of the RSA promotion.

In order to measure these direct and indirect effects, surveys of three populations will be needed:

1. Applicants—This includes those who applied through their employer, plus dial-in/mail-in applicants.
2. Nonapplicants—This includes people who worked at an employment site during the time in which the RSA was promoting ridesharing there.
3. General public—This includes a sample of commuters in the affected area who were not dial-in/mail-in applicants and who did not work for a company that received RSA promotion.

The applicant survey will measure direct effects, and the nonapplicant survey will measure indirect ridesharing effects. A public survey can serve as a control to measure

external ridesharing effects, such as increased gasoline prices and such, often referred to as “exogenous” factors. Exogenous factors are likely to affect all three survey populations equally. To that degree, the general public surveys provide a baseline for the then current opinions of solo drivers. However, changes in ridesharing attitudes or behavior identified among the general public may also be due to multiple community influences, among which are the RSA program and the powerful word-of-mouth effect from other ridesharers. In evaluation, the point of polling the public is to assess the general climate for ridesharing in order to help judge the effect of the program on those who have been targeted. However, to consider the public to be totally unaffected by ridesharing program effort may be naive.

A second serious weakness among some past RSA evaluations was the use of mail-back surveys. The response rate to these mail-back surveys is typically 30 to 40 percent. This creates a vulnerability to “nonresponse bias,” which occurs when the respondents are different from the nonrespondents in some dimension that you are attempting to measure. For example, one study found that the carpool formation rate among respondents was significantly higher than among nonrespondents (64). Mail-back studies cannot be considered to be more than the opinions of those who responded, usually biased in favor of the program. Increasing the sample size will have absolutely no effect on nonresponse bias. They are entirely separate issues. The only way to reduce nonresponse bias materially is to avoid mail-back surveys.

Telephone surveys suffer from some of the same problems—it has been found that nonpoolers tend to cooperate less than poolers, but the nonresponse rate is likely to be less. These are certainly more expensive (\$5 to \$10 each in 1979 dollars, compared to \$2 to \$4 each for mail-back surveys), but they are more useful because of the improved validity. In-person interviews and small group techniques described in Section 4.2 can reduce the nonresponse rate to nearly zero, particularly if program rejectors and other nonpoolers are assured that their views are of special interest. The cost is, of course, higher. The RSA must decide whether the cost savings obtained from a mail-back or even a telephone poll merit an uncertainty and potential criticism derived from their low validity and reliability.

The desired sample sizes for each survey will vary, depending on desired accuracy and what will be done with the findings. Although as noted, increased sample size with mail-back techniques only magnifies the error, as a rule of thumb for budgeting, the sample size might be about 500 for the applicant survey and about 300 for the nonapplicant survey and general public survey. This means completed interviews, not attempted calls. Thus, the cost for the survey staff will be about \$5,000 to \$10,000, to which must be added about two person-months of staff time for survey preparation, supervision, data analysis, and report writing.

Surveys have at least two benefits: (1) They provide information about the results of both the RSA campaign and exogenous factors. (2) They can provide an opportunity to obtain feedback from those who have responded to the program, joined carpools, and those who have not. Dissatisfaction and “turnoffs” can be revealed, and new needs and services determined. This is an opportunity to tell both ridesharers and the public that the RSA is interested in them,

in their transportation needs and desires, and is available to serve them.

There are many technical considerations about performing these surveys, too numerous to document in this manual. For further information, see Refs. (2, 4, 51). A quick overview of some of the important areas for investigation in each survey follows, which can provide useful insights into new target populations and motivational factors. This is not a complete list, but meant to indicate minimum requirements. A survey format can be found in the research report of the 4-cities study (3).

1. Applicant survey—Sample drawn from all applicants (including deletes). Investigate:

- Brief demographics
- How did they learn about ridesharing, the RSA
- Did they use RSA services to join carpool
- Prior commute mode of new carpools
- Size of carpool
- Trip length
- Frequency of use
- Extra pickup/dropoff distance
- Changes in home-based and work-based midday auto use

- Reasons for ridesharing
- What prevented ridesharing before application
- Length of time in carpool
- Level of satisfaction with the service
- Suggestions for its improvement (can be obtained by phrasing questions in a positive and constructive manner)

2. Nonapplicant survey—Random or stratified sample drawn from all nonapplicants at employment sites receiving RSA promotion. Investigate:

- Awareness of RSA and its services
- Commuting mode before and after RSA promotion
- Trip length
- Pool size (if any)
- Reason for not pooling
- Reasons for not responding
- Indications of possible interests under different conditions, etc.

3. General public survey—Random or stratified sample drawn from all commuters regionwide, excluding applicants and nonapplicants. Investigate:

- Awareness of RSA and its services
- Commuting mode
- Available transportation
- Perception of ridesharing
- How obtained
- Reasons for not ridesharing
- Reasons why they might rideshare

After these surveys are analyzed (the procedures for these analyses are somewhat complicated, but good guidance is available (2, 51)), the data may be used to calculate transportation impacts, in particular vehicle-miles traveled (VMT) and vehicle-trip (VT) reductions. From VMT and VT reductions, estimates can be made of fuel savings, air pollution reductions, commuter cost savings, parking demand reductions, etc.

The central findings will help to improve the program.

Disappointments, breakdown in communication, indeed anything that might have interfered with a successful entry into ridesharing can provide clues. New opportunities may be revealed and economies achieved when a given population is found to be a poor prospect for ridesharing. These points have been discussed in the section on formative evaluation.

6.8.5 On-going Program Planning

All of these evaluation activities and findings will be worthless unless they are used to improve the RSA's program. The purpose of formative evaluation is to provide a continuing "planning" capability in the RSA. This might translate to one person or a part of one person's responsibilities, but the planning task should be performed regularly. The RSA should:

1. Use evaluation findings and performance measures to improve the currently offered RSA services and the efficiency of the operation.
2. Keep up-to-date with ridesharing research and apply

relevant methods and research findings to RSA policies and practices.

3. Keep up-to-date with the transportation situation at the local, state, and federal level. This would include an awareness of potential transportation crises and possible development of contingency plans for the RSA. It would also include an awareness of legislative and regulatory developments at all levels of government and a sensitivity to possible new sources of support.

4. Use all of the above sources of information to develop long-range plans for the RSA, over a time horizon of the next one-to-three years.

Continuing planning is an activity that can be easy to put off in the face of the numerous daily crises that beset every RSA. But without coherent, on-going planning the RSA will be less able to respond to changing circumstances and improve its performance. It is recommended that 3 to 5 percent of the RSA's staff budget should be allocated to planning and that much time should be spent on planning each month.

CHAPTER SEVEN

TSM AND OTHER LOCAL, STATE, AND NATIONAL GOVERNMENT INCENTIVES RELEVANT TO RIDESHARING

■ This chapter discusses transportation system management techniques and other governmental actions that tend either to increase the incentives for carpooling, vanpooling, or buspooling, or to create disincentives for solo driving. The first section of the chapter is an anecdotal account of how some RSA directors view their role in promoting such incentives. The second section is an overview of these government-based incentives in relation to their relative costs, benefits, encouragement of ridesharing, and compatibility. The last section considers the incentives individually. For each incentive, two questions are answered briefly: What are the nature and purposes of the incentive? What are some examples of its application and, if known, its effect on ridesharing? ■

7.1 RSA PROMOTION OF GOVERNMENT-BASED INCENTIVES

RSA directors tend to view their roles in promoting these ridesharing incentives in different ways. At RIDES in San Francisco, the director sees his role as a consumer advocate for the growing constituency of ridesharing commuters in negotiating with whatever government agency has authority over a promising incentive. As a result of staff negotiations with Caltrans and the city police, RIDES vans can now use the 3-mile transit bypass to the San Francisco-Oakland Bay Bridge toll plaza as well as transit-only lanes in San Francisco. Also, RIDES vans may use Caltrans-owned public parking in San Francisco for \$10 per month (in 1979 dollars) instead of the usual rate of \$50 to \$60 per month. Another current target is the rebate of state and federal taxes on

gasoline for vanpoolers organized through RIDES. A further target may be insurance rates for ridesharers, particularly vanpoolers. The RSA also advises the state ridesharing office on legislative changes that are needed to remove obstacles to ridesharing.

As an organization, RIDES spends perhaps 3 to 4 percent of its staff effort working for TSM actions and other government-based incentives; the director's time on this is about double that, or 5 to 8 percent. One problem for an RSA working on contract is that encouraging such actions is not viewed as "production" time that places a specific number of riders in pools. Consequently, RIDES has had a hard time obtaining funding for encouraging such actions. Recognition of the value of this advocacy role by funding agencies would help corporate RSAs to facilitate the development of incentives for ridesharing. If corporate RSAs structure and pre-

sent themselves as a transportation service rather than as a pool sales organization, that, in turn, will promote such recognition.

In contrast, Tri-Met Rideshare in Portland, Oregon, spends 10 to 20 percent of its staff effort encouraging other TSM actions and ridesharing incentives. Tri-Met is part of the local transit agency, and the director is strongly committed to these efforts. He views them as the second major role of the RSA after the role of facilitating community ridesharing. An example of a ridesharing incentive in Portland is the issuance of conditional use permits for new businesses specifying needed transit and ridesharing actions, by the State Department of Environmental Quality (DEQ) and the City of Portland. Tri-Met Rideshare first advised the Oregon DEQ and city agencies on what transit and ridesharing incentives were appropriate for different kinds of development throughout the metropolitan area, devoting up to half of the RSA time to this activity. Now TriMet Rideshare works with developers and employers to meet the conditions of their use permits.

Commuter Pool in Seattle also supports a strong RSA advocacy role. In one recent year, Commuter Pool's activities included developing plans for priority carpool parking in the lots of two cities; holding breakfasts and an implementation workshop to introduce flex-time to representatives of over 185 companies and federal agencies; and preparing state legislation to facilitate owner-operated vanpools, active promotion of ridesharing services, and public agency ridesharing programs using publicly owned vehicles.

There are significant problems in promoting TSM actions and other government ridesharing incentives mainly because of the scattered distribution of authority for such incentives and also because of the piecemeal way that specific projects are considered and adopted by model agencies. Projects are accepted based on political interchange, funding availability, and rules of thumb in addition to design standards and eligibility criteria. There is seldom any central, long-range TSM plan to which all the interested parties have agreed. An associated difficulty is that TSM actions are usually not backed by political power or a recognizable and organized constituency—except for government agencies such as UMTA and FHWA that promote or assist in funding TSM actions. These difficulties and the experience of RSA directors to date lead to a conclusion that the following two RSA roles seem appropriate:

1. Act first as a ridesharing advocate by building both a successful ridesharing program and a conscious ridesharing constituency.
2. As a second priority and wherever possible, promote several types of action that provide incentives to ridesharing:
 - a. Legislative changes that remove impediments to ridesharing.
 - b. Complementary TSM strategies.
 - c. Regulations requiring employer ridesharing actions either on an emergency or continuing basis, out of environmental or energy conservation considerations.
 - d. Private sector actions, such as reduced ridesharing insurance rates or financing owner-operated vanpools.

The remainder of this chapter considers the first three of the preceding types of incentives. The fourth type, private sector actions, was covered in Chapter Six, with additional material on van financing and insurance in Appendix C.

7.2 OVERVIEW OF TSM AND OTHER RIDESHARING INCENTIVES

In order to be credible and effective, RSAs need to take a broad view of the effectiveness of TSM actions and other governmental ridesharing incentives. Even if ridesharing is enhanced by some action, if the overall effects of the action on the environment, commuting cost, etc., are unfavorable, an RSA would hardly want to argue for the action.

To evaluate TSM actions comprehensively, Jones et al. (65) suggest looking at these multiple objectives of TSM economic efficiency, social equity, environmental quality, accessibility, facility productivity, and political acceptability.

An additional one is safety. For example, the Santa Monica Diamond Lane required crossing other traffic lanes—a hazard that might have become more salient if the existence of the Diamond Lane had been tolerated longer by the community.

From the viewpoint of these objectives, the more coercive ridesharing incentives become, the greater the losses in economic efficiency, equity, and political acceptability, and sometimes accessibility, despite gains in facility productivity and environmental quality. TSM actions and other governmental incentives may be loosely rank ordered from the most voluntary to the most coercive as follows:

1. Model ridesharing legislation.
2. Ridesharing subsidies, program support, and promotion.
3. Flexible working hours.
4. Park and ride lots, preferential parking.
5. Preferential freeway entry.
6. Reserved, preferential, or exclusive lanes for high occupancy vehicles.
7. Air quality and energy conservation regulations.
8. Area of facility tolls.
9. Parking taxes or surcharges.
10. Increased gasoline taxes, or rationing.
11. Restrictions on parking or access.

Several TSM actions are excluded from the list because they are not judged to be significant ridesharing incentives. These are improvements in urban goods movement, traffic management, transit and paratransit operations, and pedestrian and bicycle facilities. To the extent that some solo drivers are dissuaded from ridesharing because they "need their car during the day," improved midday transit and paratransit service could also help encourage added ridesharing, but this benefit is believed to be minor in relation to the cost of providing such service.

Table 21 summarizes the feasibility of these ridesharing incentives and their estimated effect on ridesharing. The limited evidence available on the overall cost effectiveness of these actions (e.g., 16, 65) suggests the following classification of these measures on the basis of their cost per vehicle-mile of travel (VMT) or vehicle-hour of travel (VHT) reduced (note that only preferential HOV ramps or lanes, park and

Table 21. Summary of TSM ridesharing incentives.

<u>Incentive</u>	<u>Feasibility or Prospects</u>	<u>Effect on Ridesharing</u>	<u>Incentive</u>	<u>Feasibility or Prospects</u>	<u>Effect on Ridesharing</u>										
1. Model ride-sharing legislation	Model laws are now available; its prospective date of adoption by states is uncertain	State adoption should remove the legal barriers to ridesharing, at up to 16 passengers per vehicle.	12. Access restrictions	Prospects are unlikely except for transit/pedestrian malls because of public reaction, institutional problems, and lack of alternative access.	Negligible effect anticipated because of limited applications.										
2. Ridesharing subsidies, program support, and promotion	Direct subsidies unlikely, except for empty seats on new vanpools. Program support is well accepted. Promotion may help develop general awareness.	Indicated subsidy appears effective in starting vanpools. Effects of and national ridesharing promotion seem promising.	(For details on the following employer incentives, see Chapter 6.)												
3. Flexible working hours	Most employers are reluctant to change from set working hours until real benefits for the company can be shown. Thus the spread of variable working hours is uncertain and probably slow.	Adoption of flexible working hours usually has a facilitating effect on ridesharing, similar to (safe) park-and-ride lots.	13. Preferential employee parking and parking fees	Preferential parking is much more acceptable to employers than parking fees for the 75% who now have free parking at their place of work.	Both are highly conducive to ridesharing and one or the other is essential to a high level of ridesharing.										
4. Preferential parking, park and ride lots	Very feasible because of low capital requirements and uncontroversial nature.	Preferential parking can increase ridesharing. Little effect is achieved by park and ride in absence of other incentives, but with them, the lots facilitate pool formation in low-density areas, as well as carpooling to railheads.	14. Use of company vehicles for errands and late trips home	Rare at present but probably quite feasible; more experience is needed	Very supportive, especially where transit service is poor.										
5. Preferential freeway entry	Widespread use is possible in highly congested corridors, depending on local initiative.	Preferential freeway entry is effective where significant time are made and are much more cost effective than reserved or exclusive lanes.	15. Fleet ride-sharing	Successful in California and Seattle; future looks attractive	Enhances ridesharing due to low cost and simplicity.										
6. Exclusive HOV roadways and reserved HOV lanes	Selective application is possible in highly congested corridors, but preferential entry is usually cheaper	HOV lanes are effective where time savings are gained for poolers.	16. Special van-pool and bus-pool incentives (e.g., assistance in arranging van loans)	A variety of these minor incentives are in wide use employers.	Apparently effective though effects are not well documented.										
7. Air quality and energy conservation regulations	Feasibility appears to be good where an area-wide or state agency has jurisdiction and enforces the regulations.	Regulations are moderately effective for a large area depending on the willingness of employers to make efforts	17. Equivalent treatment of transit riders	Discounted or free transit passes, or cash in lieu of such passes, are increasingly popular both for energy conservation and equity reasons, though still not common.	Very conducive to transit use; probably neutral to ridesharing.										
8. Area or facility tolls	Prospects are unlikely except for small, specialized areas or for nominal tolls on facilities, because of public opposition and institutional problems.	Little effect anticipated except in combination with other incentives	ride lots, preferential parking, and flexible working hours are intended to reduce both VHT and VMT, whereas the other actions tend to reduce only VMT):												
9. Parking taxes or surcharges	Widespread use is unlikely because of public and business reaction, economic impact and institutional problems.	Effectiveness is unknown, but possibly significant.	<table border="1"> <thead> <tr> <th><u>Total Cost Per VMT or VHT reduced</u></th> <th><u>Actions</u></th> </tr> </thead> <tbody> <tr> <td>Very Low</td> <td>Model ridesharing legislation Ridesharing program support and promotion</td> </tr> <tr> <td>Low</td> <td>Flexible working hours Preferential freeway entry Park and ride lots Facility tolls Air quality regulations Zoning regulations</td> </tr> <tr> <td>Medium</td> <td>Preferential parking Area tolls Gasoline taxes and rationing</td> </tr> <tr> <td>High</td> <td>Reserved and exclusive HOV lanes* Ridesharing subsidies Parking and access restrictions Parking taxes and surcharges.</td> </tr> </tbody> </table>			<u>Total Cost Per VMT or VHT reduced</u>	<u>Actions</u>	Very Low	Model ridesharing legislation Ridesharing program support and promotion	Low	Flexible working hours Preferential freeway entry Park and ride lots Facility tolls Air quality regulations Zoning regulations	Medium	Preferential parking Area tolls Gasoline taxes and rationing	High	Reserved and exclusive HOV lanes* Ridesharing subsidies Parking and access restrictions Parking taxes and surcharges.
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High	Reserved and exclusive HOV lanes* Ridesharing subsidies Parking and access restrictions Parking taxes and surcharges.														
10. Gasoline taxes, rationing, and shortages.	Shortages seem likely to occur, which may induce rationing. Much higher gas taxes are politically unpopular, but gas prices may continue to escalate.	Shortages and rationing significantly increase ridesharing to RSAs. Gradual, moderate gas tax and price increases have little effect except on lower income travelers. However, cost increases also produce strong consumer anger and backlash against loss of solo driving. Vanpools are eligible for priority fuel allocation in shortages.	* In very high-density travel corridors, added exclusive HOV lanes can have a low cost per VHT or VMT reduced.												
11. Parking supply restrictions (auto restricted zones)	Widespread use is unlikely because of public, business, and employer reactions and institutional problems, except the technique of curbing growth of parking.	The effect is very significant for impacted employees. Availability of parking appears to be powerful incentive in some communities.	The next section discusses the effects of these individual actions separately. However, some of the actions work well together. In particular, the first 5 (or 6) actions in Table 21 plus peak-off peak pricing differentials (from the eighth category) form a package of actions that are either voluntary or have their coercive effects balanced by individual choices. For example, an individual has the choice of ridesharing,												

waiting in preferential entry queues and/or paying some other peak-hour price, or commuting to work at a less congested period. This situation contrasts with the Santa Monica Diamond Lane, to pick an extreme case again, where the driver's choice was either to rideshare or to bear the burden of increased congestion in the other freeway lanes. The high-occupancy vehicle lanes, the sixth, may also form part of the "greater benefits" package, provided that they are well designed in terms of safety and that they do not so immediately congest remaining routes that a serious hardship is worked on solo drivers.

7.3 TSM ACTIONS AND INCENTIVES

7.3.1 Model Ridesharing Legislation

In September 1979, the National Committee on Uniform Traffic Laws and Ordinances completed a model state law to remove legal impediments to ridesharing, under contract to the Federal Highway Administration. The model law would revise present state laws that impede ridesharing. The Committee also produced a comprehensive survey of present legal impediments to ridesharing, authored by Kearney (66), that contributed to development of the model law. The text that follows first draws on Kearney's survey to present the major legal impediments to ridesharing and then summarizes the provisions of the model law.

7.3.1.1 Effects of Present Laws Affecting Ridesharing

All states have laws that impede ridesharing in some way. For example, all 50 states have laws that apply to motor vehicles carrying passengers for compensation. These laws generally require that anyone wishing to transport persons for money must obtain a certificate to operate from the state public utility commission (PUC). In states that have not modified this provision in relation to ridesharing arrangements, such laws are a serious barrier to ridesharing.

- The certification procedure usually takes two to three months even if there are no objections from competing carriers.
- Through the certificate to operate, the PUC regulates rates, schedules, and routes of the ridesharer as well as the quality and safety of the vehicle; any changes in these items must receive prior approval of the commission.
- The original certificate to operate and any subsequent changes in it may receive objections from previously certificated operators who feel threatened by the competition, which may extend the certification process indefinitely or cause denial of the application.
- Insurance is required and is much more expensive than private auto coverage because of the broader liability assigned to a motor carrier by law compared with a private auto; also, motor carrier insurance is not as easily available as that for private auto.
- Money received by motor carriers is regarded as taxable income.
- Other provisions such as parking or lane restrictions, higher registration fees or taxes, and a special driver's license may apply.

Eighteen states and the District of Columbia have yet to grant any specific exception to ridesharing arrangements

from their motor carrier laws. In 13 of these 19 jurisdictions, ridesharing arrangements can be regulated as common carriers. Although it is believed that the public utility commissions in these 13 jurisdictions will not in fact regulate carpools, there is no guarantee of this, especially if carpools advertise publicly for members. Several public utility commissions in these jurisdictions have specifically declined to regulate vanpools. In the six jurisdictions where ridesharing arrangements cannot be regulated as common carriers, ridesharing will probably fare better because contract carriers, which probably include ridesharing pools, are not regulated.

Thirty-two states grant some kind of exemption to ridesharing. The exemptions are usually subject to limitations that could exclude some ridesharing arrangements. For example, 17 states restrict the ridesharing arrangement to work trips only, several even to the point of excluding non-home pickup points or dropoffs at more than one employer. The arrangements have to be nonprofit in 9 of the 32 states, and some are required to be noncompetitive with public carriers. Third party operations are most frequently not exempted from regulation.

The cost and availability of insurance for ridesharing vehicles have been problems. Because of the greater experience now with ridesharing, there seems to be less of a problem except for cases of third-party liability and where states classify ridesharing arrangements as motor carriers or commercial vehicles. Also, of the 24 states with no-fault insurance, there are only 7 in which a person's individual insurance coverage would have preference over the vehicle's insurance coverage in case of dual coverage. A reduction in ridesharing vehicle insurance rates might be achieved in the other 17 states if preference were given to personal policies there.

Some legal impediments affect employers directly. In almost all states, the probable interpretation of workmen's compensation laws will require employers to pay for injuries received in an employer vanpooling program. This coverage might extend to third-party and employee-owned vanpools. RSA directors on both coasts have found workmen's compensation liability to be a major concern of employers. In addition, in most states there is the possibility that an employer could be held liable by anyone injured in an accident of a ridesharing vehicle because of his sponsorship or endorsement of a ridesharing program. In the current absence of legal exemption or a test suit, many legal advisors recommend avoiding potential liability, especially by not sponsoring vanpools. Also, in 24 states, employers could possibly be required to pay overtime wages to drivers or riders of an employer-sponsored vanpool. If the employer is a government agency, providing vans for ridesharing may be illegal. Only three states encourage the use of government-owned vehicles for ridesharing, and federal regulations still prevent ridesharing uses of federally owned vehicles.

A final legal impediment to ridesharing in 34 states is the designation of vans with 11 or more passengers as buses or commercial vehicles. This usually makes them subject to higher fees and insurance, special equipment, a more rigorous driver's license, and extra traffic regulations.

7.3.1.2 Model Ridesharing Law

The model ridesharing law defines ridesharing arrange-

ments as transportation of persons in a motor vehicle incidental to another purpose of the driver. This definition includes carpools, vanpools, and buspools, although few of the provisions of the law apply to buspools. The provisions of the model law are:

- To exempt ridesharing arrangements with vehicles of 15-person capacity or less from motor carrier laws or regulations requiring (1) public utility commission approval to operate; (2) special insurance; (3) a greater standard of care than that imposed on drivers or owners of other vehicles; (4) special equipment or accident reporting procedures; or (5) taxes imposed on fuel purchased in another state or road user taxes on commercial buses.
- To exclude ridesharing vehicles of 15-person capacity or less from definition as commercial vehicles or buses, and to exempt drivers of vehicles with a 10-person capacity or less from “chauffeur” and “for compensation” rules.
- To exempt all ridesharing arrangements from workmen’s compensation and employer liability laws as well as from laws governing minimum wages, overtime pay, and working hours.
- To exclude money other than salary received for ridesharing arrangements with vehicles of 15-person capacity or less from sales and income taxation and from municipal licensing or taxation.
- To permit use of government-owned vehicles for ridesharing if their full cost is recovered (with possible limitation to public employees).

The model law also suggests addressing two issues that are not included in the text of the law:

- To give consideration to preference of no-fault insurance benefits from a person’s own policy in the case of dual coverage by the ridesharing vehicle policy if reduced vehicle premiums can thereby be realized.
- To facilitate park-and-ride lots by eliminating legal problems with use of public money for upkeep of such lots on private property, excessive liability for owners of lot properties, and loss of tax-exempt status for churches which allow use of their property for park-and-ride lots.

Many features of the model law have already been adopted by some states, such as Minnesota, Tennessee, California, and Washington. Universal adoption of all the recommended features would be a major step towards removing present legal and institutional barriers to ridesharing. The remaining barriers would be limited to buspools or subscription buses that exceed the 15-person capacity limitation. For such vehicles, PUC review and approval can at least be streamlined and expedited, as is now the practice in California (see Section 6.6. for details).

7.3.2 Ridesharing Subsidies, Program Support, and Promotion

7.3.2.1 Nature and Purpose

There has been no serious proposal for direct cash subsidies to ridesharers, although most transit riders have long been subsidized either directly or indirectly. The view is usually taken that there is already a strong economic incentive to rideshare because of the savings in commuting costs

compared with solo driving, so direct subsidies would add little inducement except at great cost. Nevertheless, indirect subsidies of vanpools and carpools are involved in ordinary ridesharing programs costs and sometimes at the initial stages of a vanpool, and there is an untapped potential for expanded program expenditures on more active program outreach, promotion, matching, and maintenance.

7.3.2.2 Examples and Effectiveness

Ridesharing agencies recover little if any of their costs in client fees, so their costs are in effect a public subsidy of ridesharing beneficiaries. The primary beneficiaries are persons attracted to pools and other highway users who experience reduced congestion during peak periods. In the case of third-party vanpool services, the full initial and operating cost of the vans is recovered, usually along with administrative costs. Most employer vanpool programs do not recover their administrative costs. More explicit subsidies of vanpools are often offered in the form of reduced occupancy requirements in the first month or two, while the vanpool is getting started and trying to fill its seats.

These nominal subsidies are mostly financed by federal grants from highway trust fund revenues (i.e., fuel taxes), so the road users from which the principal beneficiaries are drawn are eventually the main financiers of ridesharing. There is nothing unorthodox or inequitable in such an approach, which has been used to finance a variety of highway projects for many years.

A more ambitious vanpool subsidy program was demonstrated at Commuter Computer in 1978 and 1979 to try to combat high initial dropout rates of riders and difficulties in finding the initial rider group. The program entailed fare reductions for new riders to 50 percent in the first month, increasing gradually to 100 percent in the fifth month; lowering the minimum starting requirement from 8 to 5 riders, plus the driver; and offering current riders one-half month’s free fare for each new vanpool rider they brought in. The 1979 evaluation of this program drew the following conclusions: (1) The finder’s fee was effective because it took advantage of one of the most influential sources of information on the vanpool program, word-of-mouth from existing riders. The finders fee brought in 25 percent of all new riders in the demonstration. (2) The reduced fare was not an effective way to expand the program because only 12 percent of the dropouts from it mentioned increasing fare as a reason. (3) The reduced occupancy incentive was effective in expanding the size of the van fleet, but it must be followed by an aggressive program to increase occupancy and avoid making these new vanpools prohibitively expensive.

Proposals have been advanced to offer rebates on state or federal gasoline taxes to vanpools, similar to those offered widely to public transit buses, and in some places to taxicabs. So far, there are no known examples of such tax rebates. Sales tax exemption for vanpools exists in the State of Washington and is being sought in other states.

A strong case can be made for indirect public subsidies. To the degree that ridesharing is a conservation measure, the public as a whole benefits from reduced dependency on foreign petroleum with its consequences for a more favorable balance of trade and reduced inflationary pressure. Reduction in air pollution, accidents, and highway congestion also

offset the cost of subsidies. Private sector subsidies, of course, already exist. Companies are often interested in facilitating secure ridesharing and transit to extend labor markets, reduce their parking and access problems, and maintain productivity during fuel shortages.

7.3.3 Flexible Working Hours

7.3.3.1 Nature and Purpose

Flexible working hours, also called flex-time or flexitime, can be offered in four versions according to a recent study by Jones et al. (67). In order of increasing flexibility, they are:

- *Employee-chosen staggered starts*, with stable daily schedules, but letting each employee's schedule begin insofar as possible at the time he prefers over a designated range, such as 7:00 to 9:30 a.m., and end at a time dependent on the starting time.

- *Flexible start*, over a designated range, such as 7:00 to 9:30 a.m., with a fixed lunch hour and variations in quitting time dependent on the starting time.

- *Flexible hours*, defined as flexible starts plus permission to vary the daily lunch hour at each employee's convenience, usually over a specified range.

- *Flexible days*, which in addition to flexible hours permit variations in the length of time worked each day, such as from 6 to 9 or 10 hours, so that excess time worked can be accumulated and used to take a part or all of a day off—the most popular is Friday afternoon—from time to time.

The time when everyone must be present in flex-time schemes is called core time. In a flexible hour plan, the core time might be 9:30 to 11:30 a.m. and 1:30 to 3:30 p.m., with 7:00 to 9:30 a.m. arrival times and 3:30 to 6:00 p.m. departure times.

The principal objective of flex-time is to achieve a reduction of peak period travel demand by encouraging use of highways and transit systems in the shoulders of the peak, permitting faster commute trips and increased highway and transit capacity without adding facilities or equipment. However, ridesharing is also facilitated by flex-time, particularly among different employers or large activity centers where differences in working hours can prevent such matches. Simple staggering of work hours with different standard starting times for different employers contributes to flattening of peak travel demand but interferes with ridesharing arrangements among different employers by introducing another matching problem. A 4-day work week probably also reduces ridesharing opportunities between firms, except among others on the same schedule.

All four types of flex-time are popular with workers, and their popularity increases with increasing flexibility. Most employers who try flex-time report significant gains in employee morale and productivity, although the approach is not applicable to all types of organizations or employees. Even when the general types of flex-time are not appealing to employers, they will sometimes allow employees to make small adjustments in their daily schedules when that will facilitate pooling arrangements. A complementary policy is to encourage or provide for stability in departure schedules (i.e., minimal overtime).

7.3.3.2 Examples and Effectiveness

Areawide programs to promote variable work hours have occurred in only a few major U.S. cities, such as New York, Washington, D.C., and Philadelphia (6, pp. 47–53). The programs in New York and Washington have been mainly staggered working hour programs instead of true flexible hours, although both 4-day work weeks and flexible hours are now in effect in some federal agencies in Washington, D.C. (9 days instead of 10 in a 2-week period). The Philadelphia program is a comprehensive effort to institute flexible hours among center city employees. In 1975, 2 years after the full-scale start of the program, over 30,000 employees or about 10 percent of city center employees had switched to the system. Preliminary results indicated a flattening of the peak on the transit system. The program was not oriented toward ridesharing, and its effects on ridesharing are not known. The program has been quite popular among participating employers and employees.

More recent results in the San Francisco Bay Area (66) indicate that flexible hours have had a mildly positive effect on ridesharing in the six major employers surveyed. In no case was there an increase in driving alone or a decrease in ridesharing. Table 22 gives the results from five of the six companies (68, p. 11). Wagner (69) cites results in Toronto and Washington, D.C., that also support this conclusion.

Table 22. Preliminary mode change results for five Bay area firms with flex-time.

	Drive Alone	Shared Ride	Transit	Other
<u>LAWRENCE BERKELEY LABORATORY</u>				
				Sample Size = 392
Mode Share Before Flex-time	50%	22%	13%	15%
Mode Share After Flex-time	45%	26%	14%	15%
Mode Change in Mode Share	-10%	+18%	+8%	0%
<u>CALTRANS</u>				
				Sample Size = 153
Mode Share Before Flex-time	27%	43%	28%	2%
Mode Share After Flex-time	20%	55%	23%	2%
Percent Change in Mode Share	-26%	+28%	-22%	0%
<u>CHUBB-PACIFIC INDEMNITY*</u>				
				Sample Size = 152
Mode Share Before Flex-time	3%	20%	71%	6%
Mode Share After Flex-time	1%	21%	72%	6%
Percent Change in Mode Share	-67%	+5%	+1%	0%
<u>STANDARD OIL*</u>				
				Sample Size = 88
Mode Share Before Flex-time	2%	15%	80%	3%
Mode Share After Flex-time	1%	17%	78%	4%
Percent Change in Mode Share	-50%	+13%	-3%	+33%
<u>METROPOLITAN LIFE INSURANCE COMPANY*</u>				
				Sample Size = 309
Mode Share Before Flex-time	6%	17%	75%	2%
Mode Share After Flex-time	3%	18%	77%	2%
Percent Change in Mode Share	-50%	+6%	+3%	0%

*Companies with such low percentages of solo drivers may not warrant expensive ridesharing program efforts

Source: Ref (72), Table 1

As with park and ride lots, flexible hours probably only facilitate ridesharing that is motivated by other factors. However, this effect together with a probable tendency to improve peak-hour-travel conditions by flattening the peak suggests that flexible hours among major employers would be a useful community level incentive. This is particularly true when combined with other strategies that “price” peak-hour use for low-occupancy vehicles, such as facility or area differential tolls or preferential freeway entry. Jones et al. (67, p. 9) report a study of work start times in downtown San Francisco which found that 67 percent were between 7:30 and 8:30 a.m. and that only 14 percent were before 7:30 a.m. This indicates some potential for flexible hours allowing both increased pooling and peak spreading. Other cities with different industry mixes may be even better prospects.

However, significant institutional and public acceptance problems may be expected with any but a voluntary flexible hours program and very nominal and traditional tolls. On-the-hour or half-hour start times are standard in the United States, and there is no institutional machinery set up to bring about a widespread change. On the other hand, a survey of the 150 largest employers in the San Francisco Bay Area suggests that work schedule changes as part of a carpool program are more acceptable to employers than providing preferential parking or sponsoring a vanpool program (65, p. 22). RSAs should keep this in mind in requesting incentives from cooperating employers. The percentage of respondents in that survey which viewed the given actions as “inappropriate under almost any circumstances” was as follows:

Action	Percent
Carpool matching	10
Reschedule work hours	11
Provide preferential parking for carpools	29
Sponsor a self-financing vanpool program	40
Subsidize a vanpool program	55
Share cost of a subscription bus service	72

The phrasing of the question on rescheduling work hours could suggest either staggered hours or any of the four types of flex-time, so a more accurate appraisal of the market potential for flex-time and staggered hours would be desirable. Results of the current work by Jones et al. (67) suggest that insurance companies, corporate headquarters, and government agencies are often quite open to flexible hours because of the resulting gains in productivity and reduced turnover and absenteeism, whereas manufacturing and retail firms will usually opt instead for employee-chosen staggered starts or simply for staggered hours. Hewlett-Packard in Palo Alto illustrates a notable exception—a manufacturing company with flexible assembly (like SAAB) in which each worker finishes multiple steps of a unit.

Another early finding of the same research is that ridesharing potential increases with the flexibility of flex-time, counter to the supposition that employee-chosen staggered starts might be most conducive to pooling arrangements. The reasons may be that (1) around three-fourths of workers under flexible hours keep to a uniform daily schedule most of the time, varying it only when special needs arise; (2) flexible starts facilitate experimentation with routes and schedules at the beginning of a pool because delays will not result in penalties of loss of work time; and (3) flexible hours permit

varying one’s schedule to pool less than five days a week when that is all that can be managed, plus taking time for errands at noon, when necessary, rather than to or from work.

The popularity of flexible hours with employees is illustrated by a recent study of flex-time as introduced at DOT’s Transportation Systems Center in Cambridge, where over 85 percent of respondents to a survey felt morale had increased (70). Over 50 percent felt productivity had increased, due in part to availability of more personal “quiet time” and the practice of working a full 8 hours even if travel or other conditions cause late arrivals. Working difficulties were minimal, and an average of over 10 minutes was saved in the morning journey to work by most staff. A more recent paper on the same program (71) reported that the following reasons were cited as important in their own choice of working hours by over 10 percent of the staff:

	<u>%</u>
• Facilitation of after-work activities, usually involving one’s family	(72)
• Avoiding traffic congestion	(69)
• Meeting schedules of other household members	(39)
• Accommodating own sleep patterns	(38)
• Work-related reasons	(28)
• Meeting family meal schedules	(23)
• Making carpool arrangements	(23)
• Before-work activities	(22)
• Transit service convenience	(19)
• Lunch time activities	(18)

Note that 23 percent of the staff thought that flexible hours helped them with ridesharing arrangements, which supports the San Francisco findings previously reported.

Probably, the RSA with the most experience in promoting flex-time is Seattle-King County Commuter Pool, which has developed an excellent employer manual on the subject.

7.3.4 Park-and-Ride Lots; Preferential Parking

7.3.4.1 Nature and Purpose

State or urban authorities can locate parking lots at convenient locations near the home end of work trips to serve as collector points for drivers to park and join their carpools or vanpools. The lot may be underneath freeway structures or adjacent to major arterials, or it may be a portion of a shopping center or church parking lot. It may also be combined with a transit park-and-ride lot which can permit, in addition, carpooling to railheads.

The purpose of such lots is to help consolidate solo trips from low density areas into ridesharing trips by providing a safe, central location for meeting or for shifting from carpools to public transit. Often this can be done with land that has little alternative use, such as freeway rights-of-way, or that has low parking demand during normal working hours, such as church parking lots. It is crucial, however, that these ridesharing staging areas be secure areas. Lots which raise fears of vandalism or mugging will never be used.

Downtown public parking lots can also be segregated to give preference to ridesharing vehicles, either as to price or location, but there is little experience with this incentive.

Although conventional experience indicates that mode splits or vehicle changing is not popular, the 4-cities study completed for this manual revealed that 53 percent of the national sample of solo drivers favored park-and-ride ridesharing as long as the lot was safe from vandalism or personal assault. The method was most popular among blue collar workers and least among managerial and professional workers.

7.3.4.2 Examples and Effectiveness

There are many ridesharing staging areas throughout the country. Some examples include several lots in Sacramento, California, and on 72nd Street in St. Louis County. Also, the "Blue Dash" park-and-ride lots off U.S. 1 in Miami, Florida, are used by carpoolers. Because these lots fill an obvious need and are used by ridesharers, they are probably a useful incentive in low density areas. A precise cause and effect relationship is not known. However, it is apparent that the lack of meeting places and/or lack of safe ones can lead to ridesharing parking spilling over into lots not intended for that purpose. For example, some vanpoolers use BART (Bay Area Rapid Transit) lots in Alameda and Contra Costa County, California. Table 23 (28, p. 232) summarizes some guidelines for locating and designing park-and-ride lots from a University of Washington study.

The principal example of a downtown public preferential parking for ridesharing in the U.S. is in Seattle (73). There, a 219-space lot and a 600-car garage on the edge of the CBD offer preferential parking for carpoolers for \$5 per month in the garage and free in the lot or on the adjacent streets. The regular parking rate is \$25 per month. To be eligible for these rates, a carpool must have a minimum of three members who commute together at least 4 days per week and must be certified by a municipal agency, Commuter Pool. The lot is filled to capacity, almost exclusively with carpools, but the garage is largely underutilized with only 132 registered carpools and 100 regular monthly parkers because of a less favorable location.

An evaluation of the carpool parking discounts by the Urban Institute revealed that 62 percent of the survey respondents were new carpoolers. About 20 percent of the respondents mentioned the discount price as a reason for carpooling in response to an open-ended question. Trip time and convenience also influenced carpool formation, but the exact effect of these three factors is not known.

In the Seattle experiment: 22 percent of the carpoolers were former solo drivers, 38 percent of the carpoolers were former carpoolers, some carpoolers were diverted from less convenient parking outside the downtown area, and 40 percent of the carpoolers were drawn from the transit system.

A Canadian experiment with carpool parking discounts in the edge of the Toronto CBD offered carpool parking from \$1.50 to \$0.50 per day at one lot and from \$1.25 to \$0.35 at another (73, p. 26). Preliminary results reveal 23 percent of the carpoolers were former solo drivers. However, only 8 percent were drawn from transit. This is an example of the first acceptors phenomenon referred to earlier and should indicate the attractiveness of the site to ridesharers. No single incentive is sufficient, and this one requires greater ride-share promotion and formation to use the parking incentive.

Table 23. Park-And-Ride design considerations.*

- Time and cost are important parameters in determining whether park-and-ride lots are applicable. If it is easy, inexpensive to park at an activity center, park-and-ride lots will be less effective.
- Lots to capture long-distance commuters should be located either near the potential service area or a point close to the urban center where congestion increases significantly. A lot would normally be located where a bus can equal or improve auto travel time for that section of the trip.
- Bus headways should be short and set according to the needs of the park-and-ride clientele.
- Larger lots (300+ cars) are often more economical to operate and can be located so as to draw from a side area. However, small lots are often the only way park-and-ride services can be provided and may help make services more personal. More intensive marketing efforts have to be made to reach the potential users of small lots.
- Internal circulation should be planned for the user as a pedestrian. Walking distances to bus boarding areas should be no greater than 500-900 feet, depending on the climate.
- Lots should be easily accessible from major freeways or arterials. Optimally, the lot should be visible from the roadway.
- The total cost of parking and transit must be kept below out of the pocket auto commuting costs (parking and tolls), and/or a significant time savings must be provided to transit patrons.
- A protected waiting area should be provided if the climate is not mild, but if bus shelters are not available, every attempt should be made to have a bus at the boarding stop so that patrons can board immediately.
- The parking lot must be secure. If conditions warrant it, a guard should be provided to protect parked vehicles and patrons.

*Source: University of Washington, Locating and Operating Bus Rapid Transit Park-Ride Lots: A Synthesis of Experience and Some Preliminary Planning Guidelines, UMTA Report No. UTM-20 (August, 1973).

Thus, the effectiveness of parking price reduction alone for ridesharers looks doubtful. The major question is whether parking price reductions alone attract enough solo drivers to make the discounts worthwhile, or whether the diversion from transit plus the switch in parking location of those who had carpoled in the past offset any reduction in VMT and congestion.

The 4-cities study revealed considerable solo driver interest in preferential parking. Regional differences are significant as are those among occupation groups.

7.3.5 Preferential, Reserved, and Exclusive Lanes

7.3.5.1 Nature and Purpose

Special types of lanes for ridesharing and transit vehicles in general order of declining cost-effectiveness, include:

- Exclusive lanes at toll plazas with provision for nonstop toll collection or free passage.
- Bypass ramps, or "preferential entry" at metered free-way ramps.
- Exclusive HOV roadways.
- Reserved or preferential lanes on freeways and city streets.

The purpose of the special lanes is to free high-occupancy vehicles (HOVs) from urban congestion and thereby lower HOV travel times, increase the productivity of the facility, and attract more persons to HOVs, perhaps increasing the productivity of the regular lanes as well. Usually HOV lanes require police enforcement to prevent solo drivers from using them and thereby defeating the purposes of the lanes.

7.3.5.2 Examples and Effectiveness

The first category, exclusive lanes at toll plazas, is described in the subsection on area or facility tolls later in this chapter. Described first in the following are the performances of bypass ramps for carpools in Los Angeles. Examples of the last two types of lanes are reserved carpool and bus lanes on a major arterial in Miami and an exclusive busway that is also used by carpools east of Los Angeles. The final subsection compares the relative merits of preferential freeway entry with reserved and exclusive lanes based on computer simulations of the three types of facility. Design and planning details are not provided here. See Herbert (28) for such information.

Bypass Ramps or Preferential Entry. Reference 32 (pp. 1-10) evaluates 13 bypass ramps for carpools on three freeways in Los Angeles. In general, all other traffic has metered access to the freeways at these ramps, whereas carpools of two or more have a bypass lane that allows them to enter the freeway at will. A time saving of less than a minute to over 5 minutes may result from using the bypass lanes. In response to the savings, the carpool percentage of the total traffic entering on the ramps rose from 19 percent to 26 percent; average vehicle occupancy rose from 1.24 to 1.33. On the basis of limited surveys, the percentage of carpools formed after the ramps opened appeared to be about 50 percent. When asked their reason for forming a carpool, respondents cited time savings, cost of commuting, and fuel savings about equally. In-depth motivational studies of transportation (4) have revealed that avoidance of delay and waiting is at least as powerful an incentive as the other benefits studied. Thus the preferential lanes are a high priority objective where available. In the Los Angeles study they appear to be instrumental in the forming of perhaps one-fourth to one-third of the carpools, or about 300 carpools. Public acceptance has been generally positive, but violations are an increasingly serious problem as solo drivers grow impatient and tend to move into the bypass ramps when they see no evidence of enforcement. Enforcement or preventive remedies are presently being studied because expansion of the Los Angeles bypass ramp system is anticipated. One solution tried elsewhere has been to place a barrier between the general ramp and the bypass ramp.

Exclusive Roadways. The San Bernardino Freeway Express Busway is an 11-mile exclusive roadway for high-occupancy vehicles running eastward from the Los Angeles Central Business District. The two unidirectional busway lanes are built in the median strip or alongside the freeway, and are separated from the automobile traffic lanes by either concrete barriers or a buffer lane with flexible posts. This 57 million dollar facility is the most complete busway in the country, with on-line stations, park-ride facilities and feeder bus lines, plus a related contraflow bus lane in the CBD and outlying parkpool lots.

Beginning in October 1976 and continuing through June 1978, carpools of three or more were permitted on this previously bus-only facility from 6:00 to 10:00 a.m. and 3:00 to 7:00 p.m. During mixed-mode operations, the number of carpools on the busway/freeway has more than doubled, resulting in an increase of at least 800 carpools. The increased carpools were newly formed and not caused by diversion from parallel roadways. More than half of the busway car-

poolers surveyed said they would not be carpooling if the busway had not opened to carpools. This means that 2,600 persons are now carpooling as a direct result of the busway. Advantages of using the busway include carpooler savings of up to 18 minutes in the morning peak and up to 8 minutes in the evening peak. In case of a freeway incident, these may be even greater; also, the commuting times are more reliable on the busway than on the freeway.

When asked why they started carpooling, more than half of the carpoolers mentioned cost, with time savings or convenience reasons cited next most frequently. The more subjective, but very influential, avoidance of delay and hassle is also a factor. More than one-third of the busway carpoolers formerly drove alone, one-fourth came from buses, and a lesser percentage came from another carpool.

Even though it is at only two-thirds its vehicle capacity in the peak hour, the busway carries more persons than a corresponding lane of freeway.

Reserved Lanes. The U.S. 1/South Dixie Highway is the major arterial between downtown Miami/Central Miami area and suburban southwestern Dade County. A 5.5 mile section of the 6-lane, divided street includes reserved carpool and bus lanes during the peak morning and evening periods. The arterial has heavy commercial strip development on both sides, multiple cross streets, and curb cut access points.

Features of the "Blue Dash" project include:

- A contraflow bus lane (dropped shortly after one year).
- A concurrent-flow carpool lane for two or more occupants expanded to include buses after one year.
- Traffic signal improvements to give increased "green time" to through-traffic.
- Park-and-ride lots for transit riders and carpoolers.

The reserved carpool/bus lane is marked by overhead and post-mounted signs; it is not separated from the other two outside lanes by any barrier. Left turns are prohibited to avoid conflict with the reserved lanes.

Table 24 summarizes the impact of the project from before-during the one-year demonstration project.

Apparently the time savings and park-and-ride lots induced a large increase in the number of carpoolers. A more extensive evaluation of the project may be found in Ref. (28) and in Appendix E. Public acceptance has been generally

Table 24. Blue Dash operating results.

	Before	After	Change %
Peak period traffic volume			
persons	20,250	22,640	+12
vehicles	14,674	14,330	-2
vehicle occupancy	1.38	1.6	+14
Travel times			
general lanes	18.12	19.36	+7
bus	18.12	9.00	-50
carpool	18.12	12.12	-33
Bus patronage (# runs)	10	61	+500
avg. daily riders	365	1955	+365
No. of carpools	2641	4012	+52
% carpools	18	28	+55

Directional (peak/off-peak) split on South Dixie Highway before implementation
Carpool violation rate (# of single occupant cars/total vehicles in carpool lane) 6%-8%.

Source: Ref (28), Table E2

good, although some opposition to the project was expressed by nonpriority users and persons living adjacent to the project.

There is at least one successful attempt to allow vanpools onto contraflow bus lanes, on a 12-mile freeway stretch outside Houston used by about 30 buses and 200 vanpools during the peak period. Admission of carpools to such lanes is believed to be too risky.

The Shirley Highway near Washington, D.C., is a notable example of the effectiveness of HOV lanes in reducing the use of single occupant automobiles. Pratsch (59) noted in 1980 that the two reversible carpool and bus lanes were then carrying 39,000 commuters per peak period vs. 25,000 on the conventional 3 to 4 lanes (prior to 1969). Four-person carpools had grown from 1,000 to 3,700 per peak period and buses from 300 to 500. The most recent trend was the increase in driver-owned and operated vanpools which Pratsch noted as probably the largest vanpool concentration in a single corridor in the nation, and one composed mostly of vanpools started without financial aid or any other kind of assistance.

Comparison of Preferential Entry with Exclusive and Reserved Lanes. Computer simulation studies by the Institute of Transportation Studies (ITS) at the University of California at Berkeley indicate that preferential HOV entry may have about the same impact on productivity, fuel consumption, and pollution emissions as an exclusive added freeway lane, at much lower cost. Table 25 gives impact estimates for these two strategies on two California freeways: the Santa Monica Freeway in Los Angeles and the Eastshore Freeway in the San Francisco Bay Area.

The ITS study goes on to say (65, pp. 13-14):

When costs—the capital cost of implementation and the ongoing cost of enforcement—are considered, it appears that preferential entry is likely to be a superior option to an added HOV lane in most circumstances. In the case of the Eastshore Freeway, the California Department of Transportation has estimated the cost of ramp metering (with limited reconfiguration to accommodate high-occupancy vehicles) at \$15 million in comparison to \$50 million for construction of an added lane extending 10 miles. This analysis suggests that this is a very narrow range of circumstances in which exclusive high-occupancy vehicles lanes or freeways can be considered cost-effective when compared with preferential entry or pricing measures such as a parking surtax. Principal issues are capital and implementation costs.

The ITS study also noted that simply reserving an existing freeway lane for HOV use could have (and in the case of the Santa Monica "Diamond Lane" did have) severe adverse

Table 25. Impacts of preferential entry and added exclusive HOV lane.

Impact	Santa Monica Freeway		Eastshore Freeway	
	Preferential Entry(%)	Added Lane(%)	Preferential Entry(%)	Added Lane(%)
Travel Time	-23	-20	-14	-18
Fuel consumed	-2	-1	-1	-2
Pollution	-7	-7	-4	-6

Source: Ref. 65, Figure III

impacts because of the increased congestion in the adjacent lanes. Table 26 summarizes the estimated impacts for the

Table 26. Impacts of reserved HOV lanes.

Impact	Reserved HOV Lane Operation	
	Santa Monica Freeway(%)	Eastshore Freeway(%)
Travel time (pass. hr.)	+98	+42
Fuel consumed	-2	+7
Pollution	+2	+26

Source: Ref. 65, Figure II

same two freeways. Note that the increase in travel time is serious enough to make the take-a-lane strategy very unattractive.

A similar negative conclusion was reached for reserved, reversible bus lanes on arterial streets. That is, the mode switch is likely to be insufficient to compensate for the increased automobile congestion, particularly where the initial mode shares are strongly biased toward the personal auto. The study found that optimizing signal timing on the arterial to be a more effective strategy. Table 27 summarizes the impacts of these two separate strategies on two California arterials. The results indicate that where preferential HOV lanes are needed, the combined strategies may be a good approach. Remember that in the Miami reserved lane, discussed earlier, increased green time was given to through-traffic simultaneous with the introduction of the reserved lanes. Project evaluators considered this the key factor in obtaining public acceptance.

Wagner and Gilbert (16) also support the cost-effective conclusions advanced here for HOV lanes. VMT reduction

Table 27. Impacts of signal timing and reserved bus lanes.

Longer Term Impact	Wilshire Blvd.		San Pablo Avenue	
	Exclusive Bus Lane(%)	Sign. Opt. Pass.(%)	Exclusive Bus Lane(%)	Sign. Opt. Pass.(%)
Travel time	+ 2	+ 1	0	+ 1
Fuel consumed	+ 3	+ 2	+4	+ 3
Vehicle emissions	+ 2	+ 1	+ 4	+ 4
Productivity	- 2	+15	+12	+30

Where: Productivity is % change in pass.-mi. of travel on arterial alone,

-2% indicates 2% diversion from arterial to parallel surface streets,

+15% indicates attracting 15% more pass.-mi. to the arterial from parallel routes.

Source: Ref. 65, Figure IV

caused by exclusive HOV lanes was found to be eight times as expensive as that caused by comprehensive preferential treatments. However, the cost criteria remain capital and operation costs and these should be evaluated in each case.

Important Points about HOV Facilities. These are as follows:

1. A lengthy (perhaps 6-month or longer) public education campaign prior to beginning the project will be needed particularly where an HOV project temporarily worsens the situation for drivers not using the facility. Two notable cases where adverse public reaction forced HOV abandonment are the Southeast Expressway HOV lane in Boston and the Santa Monica Freeway "Diamond Lanes" in Los Angeles.

2. Results can be excellent, but they develop only over some years. Bus ridership on the Shirley Highway near Washington, D.C., for example, grew from 1,200 persons per peak period in 1969 to 12,00 persons in 1975. Carpools on the El Monte Busway near Los Angeles rose from 600 in 1976 to over 2,000 in 1981. Those using the HOV facility initially are usually drivers who have shifted from parallel routes. The commuting behavior change that actually adds new bus riders, vanpoolers, and carpools to the area total develops more slowly. The public, the press, and elected officials should all be made aware that this is to be expected.

3. To help speed area increases in ridesharing, RSAs should have a role from the beginning of the HOV implementation process. RSA services need to be promoted actively before, during, and after opening of the new facility. There are many ways to alert the public to RSA services for the HOV facility. Leaflets can be distributed at entrances and exits. Article and advertisements can appear in local newspapers. The aid of neighborhood groups can be enlisted. Pamphlets can be included in utility bills for the area. Fundamentally, residential neighborhoods and work sites served by the HOV facility should become and remain special high priority target groups of the RSA.

4. There is a definite synergistic effect when multiple HOV facilities can be developed. The total mode-shift effect of an HOV lane plus good preferential parking for carpools and vanpools will be greater than the sum of the two taken individually.

7.3.6 Air Quality and Energy Conservation Regulations

7.3.6.1 Nature and Purpose

Community, state, or federal regulations require ridesharing and transit promotion and incentives by employers under certain conditions. The regulations may be contingent on company size, prevailing environmental conditions, or emergency environmental conditions, such as a smog alert (see Section 6.8). Their purpose may be to reduce the environmental impact or energy use of the larger employers at all times in environmentally sensitive areas or times.

State and areawide planning jurisdictions are best suited for mandating these types of actions. Cities typically have too small a jurisdiction to be able to affect the entire metropolitan area. This concept and some examples are discussed further in Ref. 61 (pp. 54-59).

7.3.6.2 Examples and Effectiveness

Examples of required ridesharing programs include those

in Boston, Mass., the Los Angeles area, Calif.; and Portland, Oregon. Each is a different type.

In Boston, a mandatory employer ridesharing program is required under EPA regulations. It is more comprehensive than the Portland program described in the following because ridesharing and transit incentives are required of all employers having 50 or more employees at one site and of all educational institutions having 250 or more employee and student commuters. Actions required of employers include (61, p. 56):

- Making available any pass program offered by the local transit agency.
- Disseminating transit information.
- Publicizing any applicable on-street parking restrictions in the vicinity of the facility.
- Offering bicycle incentives.
- Working with the transit agency to obtain enhanced services.
- Making available any possible dial-a-ride programs.
- Conducting carpool matching and promotion (applies to employers having 250 or more commuters and educational institutions having 1,000 or more commuters).
- Providing vanpool vehicles to employee groups of 8 or more who can support their operation (applies to employers having 1,000 or more commuters).

Masspool, the statewide RSA, coordinates the program. Employers must file reports of employee commuting patterns, their plans for compliance with the mandate, and periodic statements of progress achieved. The program appears to be moderately successful. There has been a 14 percent increase in ridesharing in the Boston area, and the State is planning to expand the program statewide in 1980. Public reaction has been favorable.

In the Los Angeles area (the South Coast Air Basin, which includes Los Angeles, Orange, Riverside, San Bernardino, and Ventura Counties), state legislation requires that all employers with 100 or more employees at one site (except for Ventura County) must have emergency ridesharing plans that must be put into use on smog alert days. The local RSA, Commuter Computer, furnishes technical assistance to companies who request assistance in preparing their emergency plans. Two positive results of the program are that it reduces pollution on smog alert days and Commuter Computer gets a "foot in the door" for active outreach to other employees for on-going programs. The effectiveness of this mandatory program has been spotty enough to cause the local air quality control authority to visit employment sites and fine noncompliant employers. However, freeway traffic does appear to be significantly reduced on smog alert days.

As noted in Section 7.1, both the Oregon State DEQ and City of Portland require a range of ridesharing and transit incentives from developers and employers seeking a use permit or zoning change. This program was developed after the RSA encountered problems in getting already established business to make changes that aided ridesharing. A developer and the subsequent tenants in a polluted, congested, or otherwise environmentally sensitive area may be required to have ridesharing programs and to provide transit and ridesharing incentives such as transit shelter, preferential

and restricted employee parking, and the like. On the other hand, a developer in an area that is not environmentally sensitive may be required to furnish only transit information. DEQ and the City of Portland act as enforcers of these requirements, while Tri-Met Rideshare suggests what should be required and works with the employers to meet the requirements. Currently, the City of Portland management policy is being updated and will include priority long-term parking for ridesharing. Any new long-term parking will also be required via conditional use permits to assign priority parking to ridesharing.

Recently, DEQ has been cutting back on the stringency of these efforts because of budget problems and the realization that more enforcement is necessary to make the program effective. However, unsolved air quality problems may cause a revitalization of the program. The program is believed to be effective in increasing ridesharing where compliance has been voluntary, but no comprehensive evaluation has been conducted.

7.3.7 Area or Facility Tolls

7.3.7.1 Nature and Purpose

The simplest form of this incentive consists of a city or special toll district charging a toll for entering an increase or a differential toll, favoring carpools and other high-occupancy vehicles, on a facility that already has a toll, such as a toll bridge or highway. It can also be a new flat toll or differential toll for entering an area, such as a CBD.

The purpose of the flat tolls is usually to pay for the facility or to reduce the number of automobiles entering an area. Differential tolls that give preference to higher occupancy vehicles have an additional aim of promoting ridesharing over solo driving. However, the effect of facility tolls is limited by both the relative scarcity of toll bridges, and the like, in the U.S. and the fact that toll facilities usually carry only a fraction of the traffic entering a metropolitan area. Furthermore, congestion pricing is very unpopular in the U.S., and causes facility tolls to be limited to nominal levels, based mainly on amortizing facility costs and meeting operating costs, that have little effect on traffic volumes. The unpopularity of congestion pricing coupled with the institutional difficulty of implementing it causes area tolls to have dim prospects for U.S. cities.

7.3.7.2 Examples and Effectiveness

Examples of facility tolls include the bridges and tunnels of the Port Authority of New York and New Jersey, the Connecticut Turnpike, and the San Francisco–Oakland and Golden Gate bridges. The New York–New Jersey Port Authority charges carpools \$0.50 per day compared with \$0.75 for lower occupancy automobiles. The Connecticut Turnpike has commute ticket books of 42 tickets costing \$1.00 that are valid for carpools of three or more, while similar books valid for lower occupancy cars cost \$3.50 (62, pp. 127–142). The San Francisco bridges give free passage to carpools and vans with three or more occupants and charge other automobiles \$0.75 to \$1.00 on the inbound trip.

The effect of just facility tolls on ridesharing is not clear, and is probably slight for nominal tolls. However, when combined with reserved lanes, the impact can be significant. For

example, the number of three-person carpools crossing the San Francisco–Oakland Bay Bridge in the 3-hour morning peak doubled from 1,000 to 2,000 after the introduction of reserved lanes and no toll (67, p. 131). On the other hand, the economic incentive from the reduced carpool tolls on the Connecticut Turnpike was found to be too small to attract a significant number of carpools (74).

The only significant example of area tolls is in Singapore, a metropolitan area of 2.2 million persons. In order to enter the CBD between 7:30 and 10:15 a.m., a license costing about \$25 per month is required of all private vehicles except carpools and motorcycles. A parking fee of equal magnitude is also charged. The effect was a 40 percent reduction in traffic, a 74 percent reduction in private cars, and a rise in carpools from about 2,100 to approximately 3,900 within 3 months of implementation. Transit ridership also rose significantly. One should take into consideration that the auto ownership in Singapore of one car per 15.6 persons is much lower than the average of one car per two persons in the U.S. Clearly, the “right” to own and solo drive a car is not the cultural and political imperative it has become in the United States. Reference (75) estimates that the effect of CBD license fee of \$1.00 per day in the U.S. would be a 1.3 percent decrease in work VMT and a shift to carpools of less than that.

7.3.8 Parking Taxes or Surcharges

7.3.8.1 Nature and Purpose

Parking taxes can be applied in several different ways. The parking tax can be a flat increment added to existing daily rate or it can be a fixed percentage of the existing rate. The surcharge may apply only to commuter trips (i.e., all day parking) or it may apply to all trips. The purpose may be to raise revenue for the taxing jurisdiction and/or to reduce automobile use in the taxed area by diverting drivers to ridesharing and transit.

7.3.8.2 Examples and Effectiveness

The only known recent example of significant parking taxes in the U.S. was a 25 percent levy in San Francisco in 1970. Because of protests by parking garage operators and merchants, the tax was lowered to 10 percent about 2 years later. The 25 percent surcharge was estimated to have reduced traffic in downtown San Francisco no more than about 2 percent.

Based on the reduction in the number of cars parked, the elasticity of parking demand in San Francisco at that time appeared to be on the order of -0.3 , or a 0.3 percent reduction in the number of parked cars for each 1 percent increase in price. Based on the gross revenues, however, the elasticity of parking demand was -1.6 , because the average time parked dropped severely with the price increase. Commuters were much more sensitive to the price change than shoppers, causing long-term parking to decline relative to short-term parking. In short, the gross parking revenues went down by more money than the tax raised, with the parking garage operators taking an average loss of over 30 percent. Many private operators reduced their prices prior to applying the tax and absorbed the loss rather than reduce their parking volume.

However, increases of 35 percent to 107 percent in Chi-

Chicago's municipal parking charges on January 1, 1978, have resulted in about the same revenues to the city for a revenue elasticity of -1.0 (76). There was a substantial shift to transit after the Chicago parking price increases, but the effect on ridesharing is unknown. Madison, Wisconsin, is imposing a \$1.25 parking surcharge on vehicles arriving between 6:30 a.m. and 9:30 a.m., but its results are also not yet known. On a national level, EPA proposals for heavy parking charges in five cities were put down by Congress amid intense opposition. Limited international experience is summarized in Refs. 61 (pp. 118–124) and 62 (pp. 145–146).

On the basis of limited experience, parking surcharges seem somewhat effective in reducing congestion, but they would be more focused on ridesharing if discounts were given to parking set aside to ridesharers at lower rates. Problems with parking surcharges include institutional and public opposition, the difficulty of equitable implementation, and the risk of adverse socioeconomic effects such as a regressive tax impact. As a consequence of these problems, the technique is viewed as having little promise for widespread implementation (61, p. 124). This position is responsive to parking taxes viewed in isolation. Linked with other incentives, they may be more successful. Further, it should be noted that some public opposition is to be expected if the disincentive has any effect.

7.3.9 Gasoline Taxes, Rationing, and Shortages

7.3.9.1 Nature and Purpose

Tax increases on gasoline from the relatively low levels in the United States (1979) have long been recommended as a

means of encouraging fuel conservation, primarily through the effects of higher fuel taxes on the purchase of more fuel-efficient (usually smaller) vehicles, reduced travel, and increased ridesharing. (Of primary interest here is the last effect.) Gasoline rationing has also been proposed to achieve the same goals, as well as to allocate fuel equitably and without the risk of inflationary price increases during fuel shortages. However, the government's (1979) rationing scheme entailed a free market in surplus ration tickets, which could be purchased by anyone who could afford them, and who needs more than his rationed supply of gasoline. The net effect would still be an increase in the expenditure for gasoline, although only for those who used more than their ration. In light of this, taxes and rationing are considered together in the following.

7.3.9.2 Examples and Effectiveness

Gasoline prices and fuel consumption per vehicle are well correlated worldwide, as shown in Figure 10. Thompson (77) notes that these data do not reveal the extent to which higher fuel prices produce reduced use of large cars vs. smaller cars. Correlated data on average vehicle occupancy to indicate possible effects on ridesharing are not available.

Surveys conducted during the 1973–74 Arab oil embargo suggest that the primary source of reduced gasoline use was elimination of trips, with some increased transit use but no detectable effect on ridesharing (61, p. 140). It should be noted that there was at the time little information about, or access to, sophisticated ridesharing programs. Quantitative

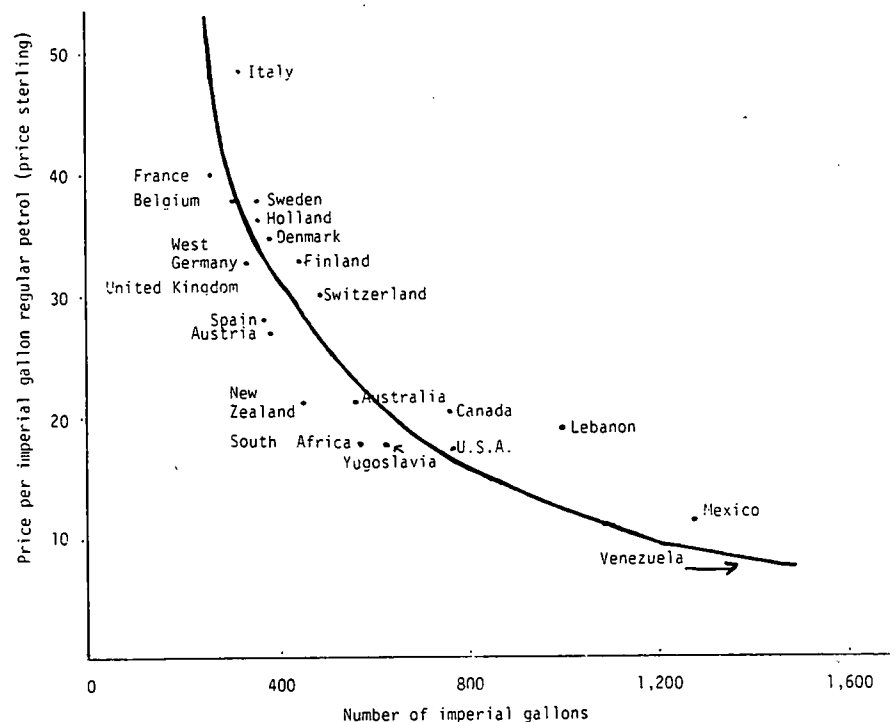


Figure 10. Annual consumption of gasoline per vehicle (imperial gallons). (Source: Ref. (77))

data are not yet available on the results of the 1979 fuel shortage and price increases, which were much more serious and took place in an environment where ridesharing agencies were more available and ready to help. Contacts with RSAs do suggest a very rapid and prolonged surge in ridesharing applications during the shortage, persisting into at least the fall of 1979 when prices were stabilized at about \$1 per gallon or some 50 percent over the previous year's level. *However, research on the motivation of consumers during the 1973–74 shortage/price increase indicates that the potent factor limiting consumption under these conditions was not cost, but the uncertainties and time delays that had to be tolerated waiting in gas lines (4). In the 1979 shortage, price combined with delay and hassle to produce the effect.*

Previous surveys of potential ridesharers had indicated that the effects on ridesharing would be significant at about \$2 per gallon. In addition, the 1979 rise is masked in part by the rapid inflation of many prices and of income in the U.S. *We conclude that fuel price or tax increases of a sufficient magnitude, especially coupled with the uncertainty and difficulty in obtaining supplies which was widespread in 1973–74 and 1979, will induce surges in ridesharing interest. Price alone has not been sufficient in the past, although it is becoming more important.* The principal lesson of this experience for RSAs, as already suggested in Section 2.1, is to be ready for the surge when the next fuel shortage occurs. To a lesser extent, this will also be true of sharp price increases, and hence of any serious gasoline tax increases. Steady minor cost increases will be unlikely to produce interest because consumers adapt their budget to small increases until costs become very great indeed. Price elasticity models notwithstanding, consumers do not react proportionate to small price increases in any valued commodity, much less when it affects mobility and independence. This finding is well supported by 50 years of psychological research.

The ridesharing effects of rationing would probably fall between those of a gasoline shortage and tax increase, but rationing seems unlikely to be imposed except in the case of severe shortage. The ability of ridesharers to pool their ration coupons might aid the inducement to rideshare, although this is not certain.

7.3.10 Parking Supply Restrictions

7.3.10.1 Nature and Purpose

Reducing the supply of metropolitan parking below what the market will normally provide can take the following forms:

- On-street parking bans or limitations on the number of spaces.
- Restrictions on public and private off-street parking facilities, such as limiting the number of spaces, restricting all-day parking to favor shoppers over commuters, or opening parking garages after the morning commute hours are over.

The purpose of limiting the supply of parking is to encourage commuters and other potential automobile users to rideshare or use public transit and thereby reduce urban street congestion. This presumes alternative access is available either through adequate mass transportation or organized ridesharing. In principle, parking supply restrictions could

include rules for preferential parking of high-occupancy vehicles. No cases are known where communities have imposed such rules, although employers frequently do so in their own parking areas.

7.3.10.2 Examples and Effectiveness

There has been little U.S. experience with planned parking restrictions, although comparison of urban areas having scarce parking, with those having abundant parking, indicates that limited parking does significantly increase ridesharing and transit use. European experience with area parking restrictions, as described in Ref. 61 (pp. 110–117), also suggests that they are effective disincentives to solo driving. The cost effectiveness of such measures remains to be verified, and modeling results to date (e.g., 65, pp. 15–17) indicate that the total cost of parking restrictions may be higher than their benefits when a reasonable value is ascribed to travel time.

Most U.S. cities have restricted parking on city streets, especially on major arterials during peak hours. This has been done mainly to improve traffic flow and reduce accidents. In general, it has not led to overall restriction in the parking supply because additional off-street public or private parking can be provided. The effect of further restrictions on on-street parking will depend on corresponding controls on the growth of off-street parking. If off-street parking is limited, on-street parking restrictions can have effects similar to off-street restrictions. Metered parking and peak-hour restriction does provide a “hassle factor” which has potential disincentive qualities. This has not been measured systematically.

The institutional problems of restricting existing parking appear less severe than those of area access restrictions. For example, the Supreme Court has ruled favorably on the legality of residential parking permits and associated restrictions of visitor or commuter street parking. Also, zoning laws can be used to restrict parking in new buildings.

The most promising immediate avenue of change in parking restrictions appears to be in zoning laws affecting the provision of employee parking. The present general practice is to provide a minimum rather than a maximum ratio of employee parking spaces to square feet of building space. RSAs will probably wish to investigate the parking provisions in zoning laws for their particular areas and to try to have them modified towards ridesharer privileges if they encourage use of solo autos only.

7.3.11 Access Restrictions

7.3.11.1 Nature and Purpose

Access restrictions involve a city setting aside an area or selected street section where automobile entry is limited. Usually, certain classes of vehicles are exempted, such as buses, delivery vehicles, and emergency vehicles. High-occupancy vehicles, such as carpools and vanpools, may also be exempted from the restriction. The restricted area may be a main downtown street as in the case of a transit or pedestrian mall, the CBD or a critical portion of it, or an historical area.

The purpose of area auto access restrictions is usually to

improve the local environment, which has deteriorated from the congestion and pollution of automobile traffic. To avoid adverse impacts, walking or transit use are promoted and facilitated as substitutes for auto trips within the restricted area. Access by carpool or vanpool may also be encouraged to accomplish this end, but this has rarely been done. Because access to a mall cannot be expected to be much inducement to ridesharing, the ridesharing impact of this concept is limited to larger areas that have parking or access controls. As with area tolls, the fragmentation of planning authority in the U.S. may be expected to make implementation of restrictions on significant areas very difficult. Public and business opinion prior to implementation may also be expected to be adverse, although reactions after implementation have been generally positive.

7.3.11.2 Examples and Effectiveness

Most of the experience with area restrictions has been in Europe, where the concept has worked well in reducing core city congestion (61, pp. 76-85, 62, pp. 127-142). Auto-

restricted areas in the U.S. have been confined to transit malls, three of which are evaluated in Edminster and Koffman (78), and to pedestrian malls. Wagner and Gilbert (16, p. 156) indicate that these kinds of malls may even cause a slight increase in region VMT due to detours. However, there is no experience with area restrictions which specifically encourage ridesharing. If the expected institutional problems can be solved to create a large restricted area in a U.S. city, success elsewhere with restriction exemptions on other types of vehicles indicates little technical problem in admitting high-occupancy vehicles, but community acceptance seems very unlikely at this time. Reference (75) estimates that a large-scale CBD-auto-restricted zone and commuter parking supply restraint would reduce work trip VMT by 5.7 percent. Any shift to shared ride would be less than this percentage.

Serious planning attention needs to be given to alternative access to high-activity centers when access restrictions are considered. The European experiments have all involved higher transit use than usual in the U.S. Reduction of access in this country could lead to severe economic impacts on affected areas.

CHAPTER EIGHT

RIDESHARING FUTURES

■ Increasingly expensive vehicles and increasingly inexpensive technologies support a strong future for ridesharing. The need for optimal levels of personalization does not decrease with the advent of existing or new technologies; indeed, the two complement each other. This chapter gives a brief overview of crucial future program emphases, new areas for applying ridesharing, and new technologies to aid both. ■

Where does ridesharing go from here? Ridesharing is probably the best method for increasing the productivity of the automobile and van: both an immediate and a long-term response to energy shortages and cost inflation that allows us to conserve our values and much of our lifestyle. In a society heavily influenced by personal mobility, ridesharing also conserves much of people's existing lifestyle.

The ridesharing art has progressed immensely as a result of the use of the computer and more recently through the development of behavioral technology and skills that provide for improved matching, familiarization, and maintenance techniques—in short, greater RSA productivity. Backing this advance has been the increasing application of social and personal psychology and of sociology that provides for a greater skill in designing pooling groups themselves. Improved survey techniques and the development of new group research methods, such as the decision analysis panels, have been significant aspects of this development.

The next should be an enlargement of the role of the coordinator in personalized matching programs. The coordinator's role in saving existing carpools by helping the members solve their problems rather than dissolve the pool has been

mentioned already, as well as the coordinator's function of helping to arrange new carpools or vanpools when that becomes necessary. The next important step will be to have the coordinator help pool members find alternate pools when emergencies prevent them from using the regular one.

However, the future may bring even greater and more dramatic advances for ridesharing. At least three areas of development should be considered: program emphasis, potential new areas of application, and improved techniques and technology.

PROGRAM EMPHASES—PERSONALIZATION AND TECHNOLOGY

This manual and the related research report have suggested the importance of personalization and familiarization in ridesharing as a tradeoff for the reduction in privacy and freedom the traveler usually associates with ridesharing. RSA readiness to respond to this repeatedly "stated need" of the traveler (3, 4) will probably ebb and flow alternately. Reduced budgets, inadequately trained or motivated staff and/or changes in value systems may produce a retrenchment toward minimal grouping by origin and destination on

the part of RSAs and/or funders. Extreme swings in this direction will encounter the hard reality of the marketplace: reduced demand. Research has demonstrated the barrier to ridesharing posed by the impersonal list of strangers, the necessity for phoning them and meeting with an unknown, unfiltered group or individual. The return flow to personalization that is likely to ensue if the RSA survives such an ebb may overshoot the budget and produce, indeed, a hand tailoring that exceeds the needs of the consumer and reduces the cost/benefit ratio of the program.

Thus, much of the future of ridesharing and of RSAs will be devoted to finding the optimal level of personalization for the community, specific population segments, and the RSA. The pursuit of this idea has been discussed in Chapters Three through Six. Development is not likely to be uniform, and it will also change pace and direction over time. The formative evaluation suggested in Chapters Three, Four, and Six is an excellent way of meeting the need.

There need not be conflict between the use of computers or other advanced technologies and the responsiveness to human needs and characteristics needed for sound promotion and personalization. It depends on how the technologies are used. The major data processing companies in their advertising even highlight the capacity of the computer to provide sensitively and efficiently for human requirements.

Even inexpensive technologies like the conference call maker have facilitated the familiarization process. The advent of the small computer has brought recordkeeping under control for the small RSA.

RIDESHARING BEYOND COMMUTING

Ridesharing, which has conventionally been applied to the commuting process, has more recently begun to expand to pooling to athletic events and for shopping. Additional new areas are now beginning to emerge. The energy shortage and rising transportation costs have begun an impetus for vacation, or other recreational travel, pooling. This is an area that has tremendous potential for expansion, particularly with the development of social and recreational groups and with the new capabilities of the electronic media for assembling people. The basis for such grouping already exists in the airlines capability for producing "kindred association groups" and for marketing economy fares. RSA coordinators and private companies can expand this concept using cars, vans, or buses as appropriate. In offering such services, it is likely that RSAs will find the need to have some Saturday and evening hours, as retail businesses have demonstrated. The potential for discovering further new purposes for ridesharing, or more specialized applications of the old ones, suggests a sizable harvest.

NEW TECHNOLOGIES FOR RSAs

Some European ridesharing programs are making creative use of *radio transmitters* to alert commuters that their pool vehicle is approaching their homes. The increased convenience and the avoidance of delay and discord among riders is apparently worth the cost. A number of communications technologies are discussed in the following that may yield these, and further, benefits.

In the U.S., many technologies exist or are on the threshold. The relatively inexpensive *twenty-four hour telephone answering services* are recommended for consideration. Some use tape recorders owned by the RSA and carrying its message. Others reach a human operator who provides answering service for a number of customers. A third procedure would transfer calls to the home of an evening-employed coordinator (call forwarding). The benefits derive from the ability of the potential ridesharer to contact the RSA on impulse, and/or when free from the business of the workday.

Low power radio and television systems broadcasting to limited areas not much larger than a small town are already well within the state of the art, and will be licensed in the near future. These stations will make it possible to target very small areas to use promotion approaches specific to the population segments there.

Cable television systems, as currently designed, could also be useful in terms of targeting specific groups for information and promotion purposes. They also can be of great value for reaching carpoolers in specific parts of a metropolitan area on specific cable routes, to provide information to existing ridesharers, or to provide information concerning emergency situations that may generate the need for ridesharing. This could result in the fast organization of rendezvous points (i.e., an impromptu emergency system).

However, the strongest potential lies in the area of *two-way interactive cable television* in which it is possible to form groups in a very short time among the large numbers in a given neighborhood or area who can receive a message, and then respond to the message center or the station (with their ridesharing destination, a rendezvous point, or willingness to provide transportation). This too has potential emergency system benefit; it has even greater potential for the careful construction of well assembled and maintained ridesharing groups.

As technology progresses, the development of the *micro-processor and miniaturized components*, coupled with the tremendous and growing capabilities of the *communication satellite for broadcasting to smaller and smaller receivers*, may eventually generate a direct 2-way communication capability between station and vehicle that would increase the efficiency and productivity of RSAs immensely. The citizens band radio is an established fact of the vehicular scene. Through the miniaturization of short wave equipment and the use of repeaters in many metropolitan areas, a network of communications will be available with greater efficiency and fidelity than the citizens band system. The hallmark of the continuing telecommunication revolution, as well as the computer revolution, has been the steady drop in cost of increasingly sophisticated equipment. If increasingly inexpensive communication equipment can be used to multiply the efficiency of increasingly expensive transportation vehicles, the gain should be considerable in increasing the efficiency of the ridesharing network.

This is merely a preview of the potential for improvement of our ridesharing systems. It embodies a challenge to RSAs to convey RSA needs to communications scientists and engineers so that they can work towards the design of transportation-relevant communications equipment and systems.

APPENDIX A

RIDESHARING ECONOMICS

COST ISSUES AND ASSUMPTIONS

Several issues need to be settled before presenting cost estimates for commuting trips. The issues are: what sources to use for vehicle operating and capital costs and how to keep them current; what vehicle lifetime to use; the effects of reduced mileage on depreciation and insurance cost; how to treat financing charges or the opportunity costs of capital; and how to value travel time increases or savings.

Sources and Currentness of Vehicle Cost Factors

Available sources of vehicle operating and capital costs are either out of date by the time they appear or based on questionable assumptions, or both. For example, the widely cited Runzheimer Company cost estimates assume a brief 4-year life span for automobiles and omit financing charges. The possible variations in assumptions can make a difference of 200 percent in the resulting cost estimate. In this appendix, 1981 prices have been estimated for cost components from various sources, and it is suggested that the reader substitute then-current costs (especially for the price of gasoline), if they have changed significantly.

Choice of Vehicle Lifetime

FHWA has in the past found 10 years and 100,000 miles to be the typical lifetime for automobiles, although its latest data on this subject are for 1976 (60). There is evidence that many cars are being kept longer because of consumer resistance to more rapid automobile price increases than in the past, but the picture is mixed, as the durability of some of the small fuel-efficient cars replacing full-size cars remains to be seen. Therefore the assumption of a 10-year, 100,000-mile automobile lifetime is continued.

Vans are fully depreciated over their loan period for costing purposes, which is appropriate for vanpool trips of average length. For example, a 75-mile daily round trip 50 weeks per year plus 150 miles per weekend puts 111,000 miles on a van in 50 months or 133,000 miles in 60 months. Vanpools with long trips usually incur higher maintenance costs. Ideally, vanpools with short trips should be financed by loans of longer duration. In the meantime, they typically have a higher residual value at the end of the loan period.

Effect of Reduced Mileage on Depreciation and Insurance

When a car is driven less because of participation of the owner in a carpool or vanpool, the rate of depreciation is reduced and insurance rates will be reduced by most companies. To the extent that reduced depreciation and insurance costs are recoverable by the car owner when he sells or trades in his vehicle, they are a valid charge against vehicle mileage. Robley Winfrey in "Economic Analysis for High-

ways" (3, p. 346) argues that over half of depreciation is generally mileage related, and most of this would be recoverable if the car is kept to the end of its useful life, through prolonged use or reduced maintenance costs. If the car is old or traded in, however, the reduced mileage does not increase the car's value proportionately. It is estimated from published used car price guidelines for high- and low-mileage cars that only 20 percent of the reduced mileage is reflected in increased car value. To balance these two extremes conservatively, 25 percent of the purchase price in this text is charged to mileage.

A sample of insurance company policies suggests that the insurance reduction for ridesharing also approximates 25 percent, so that figure will also be used for assigning a share of insurance costs to solo auto costs per mile.

Arguments that might be raised to these procedures, with answers, are cited in the following:

- *Argument:* The solo driver usually perceives at most only the cost of fuel as his total driving costs anyway, so charging part of depreciation and insurance further distorts the results from his perceived world.

Answer: Part of the problem in explaining the advantages of ridesharing is to get the commuter to appreciate his total costs of commuting. It would be a disservice both to the commuter and to ridesharing agencies to understate the true costs of solo driving as a concession to the solo driver's misperception. A more missionary role is suggested for the ridesharing agency in publishing the high cost of solo driving and the savings that could be made through ridesharing.

- *Argument:* In recent years of high inflation, many car models have depreciated very little and some have even appreciated.

Answer: Here, it is proposed to deal with the average lifetime costs of a vehicle, to the point that it is typically worn out or becomes uneconomic to keep running, to avoid the complexities of resales. In any case, while some cars have depreciated slowly, others (typically larger models) have depreciated more rapidly than usual, reflecting a market shift to more fuel-efficient models. As that shift is completed, depreciation differences should be reduced. In any case, there is usually significant depreciation in constant dollars if not in current dollars.

- *Argument:* Charging one-fourth the full cost of insurance and depreciation to mileage is still an approximation and compromise that does not fully achieve one of the desirable results: full comparability of automobile and van costing assumptions.

Answer: Van costing comparability can easily be achieved if the solo driver's car is sold; joint use of autos for noncommuting travel does put them in a different situation;

and it is better practice to use an approximate estimate of unknown costs than to ignore them altogether because they cannot be determined exactly.

Financing Charges and Opportunity Cost of Capital

Because the great majority of new automobiles are financed, estimated average financing charges have been included in the fixed or nonmileage-related costs of the vehicle. At a typical add-on interest rate of 9 percent, corresponding to simple annual interest of 16 percent, with a one-third down payment, finance charges are about 24 percent of the new vehicle price.

Opportunity costs for the purchase price of a new vehicle refer to the interest income that is foregone on the money paid for a car, and on its declining value over time (since it could be sold any year for its used value). Usually, opportunity costs are calculated with a low rate of interest to approximate the "real return on capital," an after-inflation figure of about 4 percent. Applying this percentage to the declining value of a car year-by-year over 10 years produces a figure that is 19.6 percent of the purchase price. Thus, a buyer who pays cash incurs an opportunity cost that approaches the finance charges on the car. For the buyers who finance, opportunity costs also apply to their down payment, monthly payments, and car values after the 4-year payment period. These opportunity costs amount to 16.7 percent.

Taking weighted averages based on 75 percent of buyers financing new cars produces estimates of 18 percent financing charges and 17.4 percent opportunity costs. Subtracting income tax savings on the financing costs and income taxes on the opportunity costs, assuming a marginal tax rate of 30 percent, produces after-tax figures of 12.6 percent for finance charges and 12.2 percent for opportunity costs. To estimate on the conservative side, 10 percent will be used for each. These costs are summarized in Table A-1.

Table A-2 uses cost factors from Table A-1 to derive the costs for a 30-mile round trip by various modes, as shown graphically in Figure 1 of the text. Occupancy of ridesharing modes in Table A-2 corresponds to the first bar of Figure 1, and the second bar is based on dividing the same total cost among more riders. No table is shown for the 60-mile portion of Figure 1 because it can be derived from Table A-2 plus costs or fares and time for an added 30-mile distance.

NONVARIABLE AUTOMOBILE OWNERSHIP COSTS

Nonvariable automobile ownership costs are excluded from Table A-2 because few commuters sell or defer buying an automobile because of enrollment in a pool. Thus, nonvariable ownership costs tend to be borne whether the commuter rideshares or not, and only operating plus parking costs are usually saved by ridesharing.

There is a windfall exception for the person who does sell or avoid buying a car because of riding transit or sharing a ride. The commuter who avoided the nonvariable ownership costs of a standard car saves \$3.05 or \$6.09 on a 30- or 60-mile round trip. Also, the compact car owner saves \$2.93 or \$5.87 on the same trips. These ownership savings alone are more than enough to pay for a carpool, vanpool, or club bus ride.

PRICING CARPOOLS

Drivers of carpools may need guidance from the rideshar-

Table A-1. Cost factors (1981, cents/mile).

Operating Costs	Compact Auto		Standard Auto		Van ^b
	Total	Variable ^f	Total	Variable ^f	
Gasoline ^a		6.7		9.3	14.0
Maintenance, repairs, minor accessories, tires, and oil ^c		5.1		6.2	5.0
Subtotal		11.8		15.5	19.0
Ownership Costs	Total	Variable^f	Total	Variable^f	
Depreciation ^d	7.5	1.88	7.8	1.95	
Insurance ^c	2.3	0.58	2.4	0.60	
Opportunity cost of capital ^e	0.75	0.19	0.78	0.20	
Finance charges ^e	0.75	0	0.8	0	
Taxes & fees ^g	0.5	0	0.51	0	
Subtotal	11.8	2.6	12.3	2.7	
Total Costs	23.6		27.8		
Total adjusted commuting cost		14.4		18.2	

^aBased on \$1.40 per gallon, including taxes, and mpg averages of 21, 15, and 10 for the three vehicles, respectively.
^bVan operating cost given here for comparison only. See Tables 11 and A-3 for more cost detail. Van maintenance costs are lower because they are based on a 4- to 5-year life instead of 10 years.
^cAuto costs based on (60), adjusted from 1976 to 1981 price levels at 7.3% per year (private transportation price index, 1976 to 1977).
^dBased on 1981 dealer prices and a 10-year, 100,000-mile life.
^eAssuming \$100 per \$1,000 of capital for 10 years.
^fIncludes 25% of depreciation, insurance, and opportunity cost, based on % of ownership costs that varies with mileage and is thereby recoverable. No insurance cost charged to carpool.
^gThis includes a 4% title tax and a \$20 per year registration fee. Taxes on gasoline, oil and tires are included in the costs for those items. Sales taxes not included.

ing agency for charging members who do not share in the driving, especially in the limiting case of single-driver carpools where all the riders are charged. Drivers are typically reluctant to charge the full cost of operating their vehicles, but if they could be encouraged to do so, that financial incentive might encourage larger carpools as well as the formation of more single-driver carpools, both of which are appealing objectives to ridesharing agencies.

The fact that private autos are usually used more for personal travel than are vans suggests that drivers of single-driver carpools will not usually need to recover their capital cost, even though the vehicle is operated much like a vanpool. Moreover, comparisons with vanpool fares indicate that the result of recovering capital costs of the private auto would make the carpool increase the carpool fares above those of vanpools.

To illustrate this conclusion, Table A-3 compares carpool and vanpool fares for round trips equivalent to a 60-mile solo auto round trip (64 miles for the carpool and 70 for the van). The first line of the table is based on standard auto operating and variable ownership costs, assuming division of the cost among 2 to 6 auto occupants. The second line divides the full cost of an owner-operated vanpool among 10, 12, and 14 passengers (excluding the driver). The table shows that auto occupancy needs to range from 4 to 6 persons before being cost-competitive with 11- to 15-person occupancy rates for an owner-operated vanpool under the stated assumptions. The comparison also suggests that the driver of a six-person carpool could set his fare at the 5-person rate of \$47 per

Table A-2. Cost details for 30-mile round trip.

	Out-of-pocket costs							Club Bus
	Bus	Rail	Compact Car	Full-Size Car	Car-pool	VANPOOL		
					Owner Operated	3rd Party		
Access to rail or bus ^a		\$0.97						\$0.72
Fare ^b	\$1.00	1.20						2.10
Vehicle ^c Operating costs			\$3.54	\$4.65	\$2.64	\$0.76	\$0.76	
Vehicle ^d ownership costs			0.78	0.81	0.37	1.48	2.03	
Total	\$1.00	\$2.17	\$4.32	\$5.46	\$3.01	\$2.24	\$2.79	\$2.82

Notes for Table A-2

^aFive-mile round trip at \$.144/mile operating cost plus \$.25 parking at train station or park and ride lot (the total cost of a bus or taxi or of two chauffeured trips by spouse would be higher).

^bClub bus fare is based on fares for the Fast-Bay-Peninsula Commute Club and a break even level of 32 passengers.

^cSee Table A-1. The occupancy of the ridesharing modes matches the first bar of Figure 1. It is: carpool, 2; vanpool, 11 (cost divided among 10); and club bus, 32.

^dAll private vehicles are charged only variable ownership costs on the assumption that fixed ownership costs are paid regardless of commuting habits. Carpools do not pay variable part of insurance costs because it is a rebate for less driving. See Table 11 in the text for details on van costs and insurance.

month (\$2.25 per day) and be reasonably competitive with the owner-operated vanpool while having an incentive to add another passenger at the same fare and pay completely for his operating costs, riding "free" like the vanpool driver except for the ownership costs of his vehicle.

Inclusion of total ownership costs for the carpool in Table A-3 would raise its fares by 58 percent, probably an unacceptable increase. Some other qualifications to this pricing analysis are:

- Six persons riding 30 miles together daily would require a large car to ride in equivalent comfort to a vanpool—preferably, for example, a three-seat station wagon or a minivan.

- Third party vanpools may be charging up to 24 percent higher fares than the owner-operated pools.

- Owner-operated vanpools could lower their fares even more if they decided to recover only part of their own ownership costs—as, for example, if they made the decision to use their family van for a vanpool after buying the van for their own use.

LOW-COST STRATEGIES

It is possible to beat the average lifetime automobile costs developed above by wise purchase of used cars, either ones in good condition requiring little maintenance or ones that can be inexpensively put into working condition—or even

cars that are expensive to maintain and operate, but can be purchased very cheaply and so entail little depreciation. To succeed in this requires some knowledge of used cars. Persons with them can drive by themselves perhaps up to 50 percent more cheaply than the costs given here. However, there is also usually an offsetting investment in added personal time maintaining the used car to keep out-of-pocket costs low, and there can still be a significant benefit to such persons in ridesharing.

Table A-3. Prospective carpool fares vs. vanpool fares for equivalent 60-mile solo auto round trip.

	Monthly Fares by Number of Occupants				
	2	3	4	5	6
Standard auto operating costs and variable ownership costs (\$236 total)	\$118	\$79	\$59	\$47	\$39
Owner operated vanpool fares (\$590 total)			11 \$59	13 \$49	15 \$42

APPENDIX B

CASE STUDY OF TEN RIDESHARING AGENCIES

This appendix summarizes results of a questionnaire sent to 10 ridesharing agencies located throughout the country in August 1980 to obtain firsthand information on current operations and policies. The following topics are covered:

- Staff and budget levels.
- Sources of funding.
- Functional distribution of staff time.
- Previous modes of poolers.
- Effects of transportation emergencies.
- Assessment by the 10 RSAs of a range of ridesharing strategies and policies.

STAFF AND BUDGET DATA

Table B-1 summarizes the budget and staff levels for FY '79 through FY '81 and the sources of FY '80 funding. Budgets for FY '80 vary from about \$64,000 for Colorado Springs to \$760,000 for RIDES with a mean of \$328,400. Of the six RSAs that also gave a FY '81 budget, four are planning increased expenditures in FY '81. Most of the increases reflect the current rate of inflation.

These are only administrative budgets. There may also be substantial capital and operating expenses for vanpool operations. (For example, such expenses totaled an additional \$1.6 million in 1980 for Seattle, and will reach \$3.5 million in 1981.)

In addition to the budget figures listed, five of the RSAs noted receiving donated services or equipment in FY '80 to which they assigned values of \$23,000 to \$400,000. These figures mostly comprise the commercial value of public service announcements, although Silver Spring received computer time and office space from its sponsor.

The regular staff size in FY '80 varied from 2½ persons to 24. Additional staff who are loaned from another organization or who are volunteers, interns, etc. supplement regular staff in six of the RSAs. These numbered 1 to 8 persons, mostly part time, in FY '80.

FUNDING SOURCES

The most common and largest source of funding for these 10 RSA's is the Federal Government. Federal funds channeled through FHWA, UMTA, and FEA comprise 78 percent to 100 percent of the funding for 9 of the 10, and approach one-third of the funding for the tenth.

The other main sources of funding were state agencies (usually highway agencies) and metropolitan planning organizations. Cities and counties are seldom mentioned, and only DRCOG Rideshare receives more than 3 percent of its funds from these sources. (Only 3 RSAs receive funds from more than three sources, 5 RSAs have only two sources, and

one has only one source.) Only one agency, RIDES, is not dependent on one funding source for at least 50 percent of its budget. This reflects their view that funds for a private non-profit agency need to be sought from several sources because there is no parent agency to take over if outside funding ceases.

Start-up costs for these RSAs ranged from \$10,000 to \$300,000 with an average of \$126,000. The time required for start-up varied from 2 to 8 months (with an approximate average of 5 months). DRCOG, Masspool, and Seattle experienced start-up costs at or above the average, while Carshare, TRI-MET, and Ridefinders spent less than \$100,000.

STAFF TIME BY FUNCTION

The primary functions by time spent were reported as 30 percent assistance to employers in sponsoring carpools and vanpools (which for some included promoting buspools and transit use via employers); and 28 percent matching, familiarization and maintenance assistance for carpooling.

The reported employer assistance varied widely, ranging from 5 percent to 80 percent of RSA staff time. These 10 RSAs generally recommended that new agencies spend a little more time performing this function (range of 15 to 80 percent).

Matching, familiarization, and maintenance reflected a comparably varied commitment with a reported range of 8 percent to 65 percent. (One RSA noted that staff spends only 5 to 10 percent of time on this function, but 25 to 30 percent of resources, which suggests a capital intensive computerized approach.) Eight of the 10 RSAs polled recommended that more time be devoted to this function (two made no recommendation).

In descending order of reported time spent, the remaining functions are:

- 14% public ridesharing promotion
- 11% third-party, or "sponsored-lease" vanpool service (only 5 RSAs)
- 6% information/assistance for owner-operated vanpools and buspools
- 6% "other" (see below—also only 5 RSAs)
- 4% promotion of incentives by other agencies (only 5 RSAs)
- 1% buspool service

The recommended order is roughly the same. Two RSAs made no recommendation about information/assistance for owner-operated vanpools and buspools.

The "other" category included important functions which were reported as occupying any staff time by only 5 RSAs. They comprise:

- Project design, evaluation and revision.
- Program management and administration.
- Priority parking.
- Market research.
- Shuttle vans.

Clearly all RSAs must devote some time to program design, as well as to management and administration, whether they reported these functions or not. It is also likely that some form of at least summative or historical evaluation exists, inasmuch as funders want reports of applications received, pools formed, etc. The lack of formative evaluation and of market research reported is less of a surprise, but certainly a great concern. Again, it is possible that the smaller programs, particularly, have used various informal means to get to know the community and did not think to tally this, or were at a loss as to how to express it in a simple way.

By and large, despite the small percentage of time devoted by any of the 10 RSAs polled to the cluster of functions included here under "other," most of these RSAs recommended implementing most of these functions early in the life of the program.

PREVIOUS MODE OF POOLERS

Table B-2 gives five RSA responses to a question on the previous mode of carpoolers and vanpoolers. Only 2 RSAs had data on the prior mode of vanpoolers. (Other RSAs responded, but their data were too incomplete for inclusion.)

All 5 RSAs report that a majority of carpoolers were former solo drivers. The range of percentages is from 53 percent to 71 percent, and the mean is 59 percent. Roughly equal percentages came from carpools, transit, and "other": 15 percent, 13 percent, and 14 percent, respectively. These figures are all based on surveys of RSA service users.

One RSA that surveyed the general population instead of just applicants found similar trends among all carpoolers: 70 percent had been solo drivers and 13 percent transit riders. In addition, 48 percent of that total sample had "always carpooled," indicating, no doubt, the usual greater interest of carpoolers in responding to such surveys, but also suggesting some substantial amount of baseline carpooling. Another interesting finding is that when people stopped pooling, 87 percent went to solo driving and only 7 percent to bus.

With only 2 RSAs reporting data on the former mode of vanpoolers, neither averages nor generalizations can be meaningful. One RSA found that all its vanpoolers came from single occupant cars, the other that a little under one-half did. It is suspected that the latter is more typical, and the former is based on a very few vans. Three independent sources for the prior mode of vanpools give the results in Table B-3, which suggests that the proportion of transit riders drawn to vanpooling is in part a function of the availability and use of transit in the area (high in the first case, medium in the second, and low in the third).

TRANSPORTATION EMERGENCIES AND EFFECTS

Seven of the 10 RSAs surveyed reported that they had been affected by the fuel shortage in the summer of 1979. The other 3 RSAs either started after the crisis or did not experi-

Table B-1. RSA administrative budgets, staff sizes, and funding sources.

AGENCY	BUDGET (\$1000)			STAFF SIZE: REGULAR STAFF (OTHER STAFF)*			SOURCES OF FUNDING**
	FY79	FY80	FY81	FY79	FY80	FY81	
Share-a-Ride, Silver Spring, MD	\$26	\$96	\$86	2 (1)	3 (1)	3 (1)	3(10%), 8(90%)
DRCOG Rideshare, Denver	310	362	--	3 (2)	4 (2)	--	1(20%), 8(80%)
Houston Carshare	161	300.6	400	4	10	11	1(10%), 6(2%), 9(88%)
TRI-MET Rideshare, Portland	250	350	400	5 (4)	6 (4)	6 (4)	7(15%), 8(85%)
Masspool, Boston	--	200	--	2½	2½	--	9(100%)
RIDES for Bay Area Commuters, San Francisco	534	761	--	16 (2)	24 (1)	--	1(45%), 3(13%), 6(11%), 9(31%)
Knoxville Commuter Pool	150	150	--	4 (6 part-time)	4	--	9(50%), 10(50%)
MTA Ridesharing & VANGO, Maryland	250	300	360	11	11	11	1(25%), 8(75%)
Ridefinders, Colorado Springs	58	64.5	71	3	3	--	1(11%), 2(8%), 5(3%), 8(78%)
Seattle/King County Commuter Pool (S/KCCP)	620	700	750	10 (6)	11 (8)	12 (10)	1(3%), 3(1%), 4(1%), 7(16%), 8(79%)

*E.g., either from parent organization or on loan from employers or volunteers or interns, etc.

**Key: 1, State agency; 2, Council of government; 3, MPO; 4, County; 5, City; 6, Private; 7, Other; 8, FHWA, federal aid funds; 9, FEA (through state agency); 10, UMTA

ence a shortage in their area. Two of the 7 RSAs also noted that they had been affected by recent transit strikes, and a third reported that peak-hour crowding of buses is a continuing factor in ridesharing demand.

Table B-2. Previous mode of carpoolers and vanpoolers (5 RSAs only).

Carpool Statistics*	% Former Solo Drivers	% Former Poolers	% Former Transit	% Other
Average	58.8	15.0	12.6	13.6
Range	53-71	10-24	6-23	4-30
Standard Deviation	7.5	5.4	6.4	10.9
Vanpool Statistics*				
Range	45-100	0-41	0-11	0-3

*No. of cases for carpool, 5; no. of cases for vanpool, 2.

Table B-3. Other data on former mode of vanpoolers.

	% Former Solo Driver	% Former Poolers	% Former Transit	% Other
Golden Gate, CA	37	25	33	5
KCP, Knoxville CBD	67.6	20.3	11.1	1.0
Michigan State Employees	53.8	44.3	0.5	1.3

Five RSAs reported quantitative effects of the 1979 fuel shortage on carpool applications (i.e., increase during the shortage) averaging 128 percent. Four reported an increase from before to after, with a mean of 90 percent. In three of the five cases, the growth continued from during to after the crisis. There was a wide range in both periods and extreme variability.

Only one RSA reported changes in carpool placements. (Placements increased by 140 percent from before to after. For the same RSA, applications increased by 60 percent during the crisis and by 100 percent afterwards, from a base of 384 per month.) This suggests that RSAs often have difficulty in servicing their communities during emergencies—a problem probably due both to lack of integrated transportation planning in their areas, as well as to funding problems.

No data are reported on the effects of crises on vanpooling, and the crises apparently have had no effect on RSA staff levels. One RSA did mention that employer interest in ridesharing increased from before to after the fuel shortage.

RSA ASSESSMENT OF STRATEGIES AND POLICIES

The 10 RSAs were offered 25 strategies and asked to state their position, also writing in reasons for any disagreement. The results are presented in Table B-4 as originally tabulated. The strategies do not begin to cover the range presented in this manual. Since the studies were carried out while the research for the manual was also in progress, they were culled from prior research and prior program experience only. (Because all strategies were presented in a positive sense, it is necessary to note that the high degree of agreement most probably reflects positive response bias—a common problem with survey type items. Only two items elicited the disagreement of as many as 7 of the 10 RSAs.) A brief overview of outstanding results follows.

There was total endorsement of the notion that matching and marketing should be personalized and should offer both quick response and active outreach (item 1). However, two of the components—targeting consumer groups (item 2) and familiarization meetings (item 3)—raised a few doubts. Yet another component, worksite and home-end coordinators (item 5), appealed strongly. Judging from the written comments on the target and familiarization items indicating the heavy burden these would be, it is clear that these RSAs, at least, are not yet funded and staffed for personalizing their programs, although they see the value of this. Interestingly, it is the remaining personalization item—phrased as “special” arrangements such as no smoking carpools, errand running carpools and staggered hours carpools—that drew 7 out of 10 RSAs disagreeing. This is interesting because the first two could easily be handled by any computer program capable of an origin and destination match, and because the third again requires more staff than exist in programs which were not originally set up to provide personalized matching. Comments indicated that this was just getting too complicated and that something should be left to the ridesharers. The notion that condemns such matching as “handholding” is totally at variance with consumer insistence on predetermining the important (to them) aspects of the commute.

The other controversial item (10b) concerned a statement that impersonal computer matches provide little incentive and often strong disincentive to prospective carpools.

Again, 7 out of the 10 RSAs disagreed. Again, their comments are enlightening. There is a contradiction in the response. Items 1, 3, 5d indicate the value of personalization and familiarization. Item 10b implies that “purely impersonal” methods are effective incentives. It would appear that the RSAs rose to the defense of their investment in computerized matching without attending to the words “purely impersonal.” Computers were defended as excellent tools critical for matching large numbers of applicants. The point, of course, is well taken in itself. The difficulty is that the perceptions of the RSAs and those of consumers do not match. RSAs have heavy capital and staff expertise investment in computerized matching and have found it valuable to handle masses of input. Consumers can be indifferent to how origin/destination possibilities are arrived at as long as they have a person who mediates the system, helps with familiarization and introductions, answers questions, etc. (However, it must be cautioned that many consumers fear that placing home departure and arrival times in a computer will leave them vulnerable to housebreaking—an issue discussed in the main body of the manual. Because consumers dislike receiving a printout of names of unknown others does not mean that coordinators cannot use those printouts. However, if ridesharing is to get beyond the first easy acceptors, funding for the more labor intensive personalization methods will be needed.

A selection of RSA posters, brochures, road signs, and outreach print media (Exhibits B-1 through B-4) follows to show how outreach and personalization are being developed currently.

Table B-4. Ridesharing strategies.

- | | Agree | Don't know | Disagree | |
|-----|-------|------------|----------|--|
| 1. | 10 | — | — | The matching and marketing procedures should be personalized (see next four items for examples) and should offer both a quick response and an active outreach program. |
| 2. | 7 | 1 | 2 | The ridesharing program should concentrate on appeals that are appropriate to particular subsegments of the population, such as occupation type and conditions, experience with ridesharing, size of employment site, age, income, sex, and length of commute. For example, attention should be given to the special needs of blue collar, white collar, and managerial/executive professional groups. |
| 3. | 7 | 1 | 2 | Familiarization methods, particularly getting potential poolers acquainted beforehand, are important to most commuters. |
| 4. | 2 | 1 | 7 | Special arrangements such as no smoking carpools, errand running carpools, and staggered hours carpools should be offered. |
| 5. | 9 | — | — | Local site ridesharing coordinators should be appointed, either at the work site or home end, to: |
| a. | 10 | — | — | • Learn about the nature and needs of their populations; |
| b. | 10 | — | — | • Provide information about ridesharing, with special emphasis on reaching new employees or residents; |
| c. | 9 | — | 1 | • Maintain records of prospective and current poolers; |
| d. | 8 | — | 2 | • Initiate and coordinate personalizing strategies that respond to the doubts and fears of prospective carpoolers; |
| e. | 10 | — | — | • Assist in forming new pools and enlarging current pools; |
| f. | 6 | 1 | 3 | • Provide early warnings of trouble and help deal with problems in existing carpools, such as lack of clear understanding of expectations and rules; |
| g. | 9 | — | 1 | • Coordinate with nearby employers, the local transit operator, and private providers of buspools, vanpools, taxipools, etc.; |
| h. | 6 | — | 4 | • Provide emergency services when carpools break down temporarily; and |
| i. | 7 | 1 | 2 | • Encourage other transportation energy saving activities, such as buspools to athletic events and bicycling to work. |
| 6. | 9 | — | 1 | Parking incentives--such as close in or guaranteed parking--should be provided to poolers by their employers. |
| 7. | 7 | 2 | — | Secure meeting points should be provided for pool groups, by employers and the community. |
| 8. | 8 | — | 1 | Cost incentives should be stressed for lower income groups, coupled with flextime adjustments to working hours to meet pool schedules. |
| 9. | 8 | — | 2 | Preferential carpool and bus access ramps and freeway lanes are an attractive feature since traffic congestion is the most frequently mentioned commuter problem. |
| 10. | | | | Generally speaking, (a) the use of incentives to encourage ride-sharing is far more powerful than the use of disincentives, and |
| a. | 8 | 1 | 1 | (b) purely impersonal methods such as computer matching programs* |
| b. | 2 | 1 | 7 | provide little incentive, and often strong disincentive, to prospective carpoolers. |
| 11. | 5 | 1 | 3 | More emphasis should be placed on employer marketing and on personalized employee marketing than on media marketing. |
| 12. | | | | High priorities should be given to the brokerage concepts of |
| a. | 9 | 1 | — | (a) providing a range of needed ridesharing services to commuters |
| b. | 5 | 2 | 2 | and (b) serving more in informational and catalytic roles than in an operating role. |
| 13. | 8 | — | 2 | The ridesharing agency should strive to provide detailed information and assistance, both to the general public and through employers, for forming owner-operated vanpools. |
| 14. | 7 | 2 | 1 | A "How to Carpool" handbook should be prepared and used as a part of the enrollment campaign and encouragement to continue carpooling. |

* Without a coordinator to personalize the service.



Jefferson County
Commissioner
Chris Doss
Chairman, Board of
Directors, Commuter
Services Inc.

Commissioner Doss served in the Alabama Legislature for four years. Now in his second term as Jefferson County Commissioner, Commissioner Doss is a decision maker in the distribution of federal funds for transportation in the Birmingham Urban Area and is extremely knowledgeable in the transportation field.



Michael O'Donoghue
President
Commuter Services, Inc.

Michael O'Donoghue, one of the more experienced advocates of shared transportation in Alabama, developed the comprehensive program of ridesharing offered by Commuter Services, Inc. He is well informed about the major rideshare programs in the United States. His academic background in urban planning, coupled with his experience in transportation planning have qualified him as a leader in the rideshare sector of transportation planning.


 Suite 203, Commerce Center
 2027 First Ave. North
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How To Save Money
And Make The Gas Last
It's as Simple as ABC

ALABAMA AND BIRMINGHAM NOW HAS COMMUTER SERVICES

Share The Ride Program



Suite 203, Commerce Center
2027 First Ave. North
Birmingham, Alabama 35203
Phone 205 - 322-6666

This leaflet contains some of the ways in which the idea of sharing a ride might apply to you. As you consider the best way for you to share a ride, remember that you're not making a permanent commitment when you agree to give it a try. The idea of sharing a ride is flexible enough to take many forms. Commuter Services wants to help you find the right form for you.

Sharing The Ride: A Workable Solution

Every so often a unique idea becomes a workable solution to a serious problem. Such an idea is the concept of two or more people getting together to ride in the same vehicle in order to solve the problem of ever increasing costs of driving alone, especially driving alone back and forth to work every day.

Sharing a ride means different things to different people. For some, the idea means riding with someone else one or two days a week. For others, it means riding with another every day. The following pages list some of the ways to share a ride. One way may apply to you and your fellow employees.

Whatever method of sharing a ride you choose, Commuter Services will help you get started. Here are some of the things Commuter Services can do:

- Match employees who live and work in the same area and work the same hours to form possible share-the-ride groups.
- Meet with share-the-ride groups to help with organization, arrange scheduling, work out routes, provide information about insurance, lease or purchases of vehicles, and answer your questions about sharing the ride.

CARPPOOL

There are many different ways to share the ride in a carpool. For example, you might:

- carpool every day.
- carpool only one, two or three days a week.
- carpool only in emergencies.

Carpools can be organized in several different ways,

such as:

- same driver, every day; passengers ride free.
- same driver every day; passengers pay fee to cover operating costs.
- cars/drivers are rotated weekly or daily; no charges are made.

BUSPOOL

You can share the ride in a bus by:

- using the public system regularly.
- riding a subscription bus where you have a seat reserved for you.

TAXIPOOL

You can share the ride in a taxi by arranging with two or three of your fellow workers to share the taxi fare back and forth to work.

VANPOOL

Vanpooling is a group of eight to fifteen people who share a ride in a van back and forth to work and share the cost. Vanpool groups can also be organized in more than one way. For example:

- one employee can own the van, and riders share the cost of operation.
- the employer can provide or sponsor the initial purchase or lease of the van; employees pay a fee to ride.
- a group of employees can get together to lease or purchase a van and share the cost.
- employees can take advantage of available vanpool packages where a fixed monthly fee covers the van itself, maintenance, insurance and gasoline.

PARK AND RIDE

Sometimes, sharing the ride is more workable when employees drive their cars to a designated parking place, park, and share a ride the rest of the way to work in a carpool, vanpool, bus or taxipool.

COMMUTER SERVICES CAN HELP YOU SHARE THE RIDE

So, Come On!

Save gasoline, maintenance costs, and more. Talk to your friends, neighbors and co-workers about ridesharing. Talk with your company management. Companies can benefit by supporting ridesharing programs, too. For more information contact:

Michigan Department of Transportation
Ridesharing
P.O. Box 30050
Lansing, Michigan 48909

DON'T GO IT ALONE!

Share A Ride And Save



Michigan Department of Transportation

This brochure was published in cooperation with the Michigan Department of Commerce, Energy Administration.

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DON'T GO IT ALONE!



Share A Ride And Save

Ridesharing

Don't go it alone! Share a ride and save. Carpool, vanpool or public transportation, no matter which you choose, ridesharing is the modern way to save. It's immediate, available and easy . . . just see for yourself!

Since 1974 more and more commuters have shared the ride, helping to decrease air pollution, energy consumption, highway congestion and parking problems. Best of all ridesharing saves you money!

Ridesharing saves on auto maintenance costs, gas costs, parking costs, and, in many instances, insurance costs. In addition, two-car families could eliminate or cut down use of the commuting car.

If you thought of ridesharing but dismissed the idea as impractical, inconvenient or just not right for you — think again. Take a look at what carpools, vanpools and public transportation offer you, and share the ride.

Vanpool

Put ten to fifteen people in a van, drive them to and from work — and you've got a vanpool.

Some 6,000 vanpools nationwide transport over 60,000 people daily. And they like it! Over 95 percent of all vanpoolers stay with their programs and recommend it to others.

Three basic vanpool methods all save you money over going it alone.

OWNER-OPERATOR — In an owner-operator vanpool an individual purchases a van and recovers the operating costs through passenger fares.

EMPLOYER SPONSORED — Companies buy or lease vans and assign them to qualified employee groups. One vanpool member drives and cares for the van while the other members split the costs.

THIRD PARTY — An employer or agency contracts with a private fleet management firm to provide vanpool operational services to interested individuals. This includes the provision

ANNUAL COSTS OF COMMUTING

Daily Round Trip (miles)	Vehicle Type	Drive Alone Total Costs	Shared-Driving Carpool		Shared-Riding Carpool		Vanpool 10-person
			2-person	4-person	2-person	4-person	
20	Subcompact Standard	\$ 726	\$ 398	\$ 217	\$ 363	\$ 182	\$ 372
		\$1,062	\$ 582	\$ 316	\$ 531	\$ 266	
40	Subcompact Standard	\$1,262	\$ 718	\$ 398	\$ 632	\$ 316	\$ 432
		\$1,857	\$1,053	\$ 582	\$ 929	\$ 465	
80	Subcompact Standard	\$2,194	\$1,250	\$ 718	\$1,097	\$ 549	\$ 564
		\$3,251	\$1,844	\$1,053	\$1,626	\$ 813	

Figures supplied by the U.S. Department of Transportation, Federal Highway Administration. Total costs include estimates of oil, tires, maintenance, repairs, gasoline, insurance, depreciation, finance charges, taxes and license fees in 1979 dollars. Figures based on 25 mpg for subcompact, 15 mpg for standard; estimated 250 working days per year. Vanpool fares may vary depending on how it is organized.

Vanpool continued

of vans, insurance, maintenance and assumption of financial responsibilities.

Look at the chart on the preceding pages. Depending upon the length of your work trip and vanpool size, you can save hundreds of dollars each year by not going it alone!

In Michigan, over 2,000 people ride in employer-sponsored vanpools with the number increasing daily. The Chrysler Corporation began the first Michigan vanpool program. It was soon followed by vanpools at Detroit Edison, University of Michigan, State of Michigan, Automobile Club of Michigan, Blue Cross and Blue Shield, and Michigan Bell, to name a few.

Vanpools conserve energy, improve air quality, relieve traffic congestion and save individuals money. In fact, every 1,000 vans can provide \$21 million in benefits to Michigan annually. But, compare for yourself.

Daily Round Trip (miles)	Vehicle Type	Monthly Drive Alone Cost	Monthly Vanpool Fare	Monthly Savings
20	Subcompact	\$ 60	\$ 31	\$ 29
	Standard	\$ 88		\$ 57
40	Subcompact	\$105	\$ 36	\$ 69
	Standard	\$154		\$118
80	Subcompact	\$182	\$ 47	\$135
	Standard	\$270		\$223

Based on figures found in "Annual Costs of Commuting."

Carpool

Start a carpool with one other person, and save 50% of your commuting costs! You could save \$804 a year in operating costs if you commute 40 miles a day and average 15 miles per gallon. The more people in your carpool, the more you save.

Carpooling is the easiest method of ride-sharing because it involves the fewest number of people. Here are two carpool plans to consider.

SHARED DRIVING — Each driver rotates driving his or her own car on a daily, weekly or monthly basis. Members pick up the costs each time they drive or establish a fee based on miles traveled by each member.

SHARED RIDING — A designated member, usually the most distant, picks up all other members of the carpool. One car is used. Members share all the costs or share costs from the pickup point to work.

Daily Round Trip (miles)	Vehicle Type	Daily Gasoline Used Driving Alone	3-person Carpool	
			Daily Gasoline Saved	Annual Gasoline Saved
10	Subcompact Standard	0.40 gals 0.66	0.80 gals 1.32	200 gals 330
20	Subcompact Standard	0.80 1.33	1.60 2.66	400 665
40	Subcompact Standard	1.60 2.66	3.20 5.32	800 1330

Based on figures found in "Annual Costs of Commuting."

Carpool members decide where "pickup" points are located, depending on individual needs. Members can meet at a designated point and travel to work in one vehicle. An alternate method is door-to-door pickup where the carpool driver picks up everyone at home.

Carpools are flexible and can be organized with members' needs in mind. Look at the charts to see how much gas and money you could save by carpooling.

Public Transportation

In the past few years, Michigan's public transportation systems have been dramatically improved and expanded. Service has been updated with new schedules, modern buses and trains, and more routes.

Perhaps your public transportation system has grown and changed since you last

checked. Reacquaint yourself with public transportation. In many areas bus stops are within easy walking distance, buses run more often and routes have been expanded. Costs are much less than driving a car.

You also may have access to commuter trains running between outlying areas and large cities. The cost savings make them worth looking into.

On buses and commuter trains you sit back and relax while others cope with rush hour traffic, the rising costs of fuel and other hassles of going it alone.

Buspooling is another method of ridesharing which is economically feasible when a large number of people live in close proximity to each other. Users meet at one or several points along the buspooling route. Buspools may be organized by a group of employees, an employer or the local transit authority. Fares vary depending on length of trip.

Check with your local public transportation authority today — it may be your way to share a ride and save.

Park-and-Ride

Now park-and-ride lots offer a place for commuters to park and collectively ride to work, via carpool, vanpool, bus or train.

Over 1,500 Michigan vehicles are now using 93 State owned carpool parking lots. They save nearly 75,000 vehicle miles a day and 1,000,000 gallons of gasoline yearly (based on 18 miles per gallon average).

Park-and-ride commuter lots are being expanded by the Michigan Department of Transportation, local transit agencies and others in an effort to assist many Michigan commuters and businesses.

Park-and-ride is just one more way you can share a ride and save.

COST COMPARISON
Bus vs. Driving Alone

Daily Round Trip (miles)	Vehicle Type	Daily Driving Alone Cost	Daily Bus Cost	Daily Savings	Annual Savings
5	Subcompact	\$0.88	\$0.75	\$0.13	\$ 32
	Standard	\$1.28		\$0.53	\$132
10	Subcompact	\$1.61	\$1.00	\$0.61	\$152
	Standard	\$2.35		\$1.35	\$337
20	Subcompact	\$2.90	\$1.25	\$1.65	\$412
	Standard	\$4.25		\$3.00	\$750

Based on figures found in "Annual Costs of Commuting."
Bus fares may vary in your area and transfers may be extra.
Driving alone costs do not include parking which would increase your daily driving expenditures.

HOW TO GET 80 MILES PER GALLON.

FIVE PRACTICAL WAYS TO HELP YOU SAVE GAS, CASH AND ENERGY.

5. IF YOU'RE A COMPANY, YOU CAN HELP TOO.

Companies can provide important leadership in helping to ease the continuing impact of the energy crunch. Here are nine practical programs your company can implement now.

1. Give ridesharing incentives.

Like free parking. Or priority parking. Or a cash rebate for gas. Many large companies also underwrite vanpool programs. Or provide bus passes.

2. Put in a bicycle rack.

Pedal power is a good way to get to work. Make it easier by giving cyclists a safe place to lock their "vehicle." Bike racks are a lot cheaper to install than new parking structures.

3. Use company cars for business.

If employees must occasionally drive on company business during the day, provide a company vehicle.

4. Try the telephone.

Do you spend too much time driving to meetings? If you must talk with someone, use the telephone. Make it a company policy.

5. Walk to lunch.

Patronize restaurants within walking distance. If restaurants are too far, encourage employees to bring their lunch instead.

6. Give out bus schedules.

Let everyone know all the possible bus routes they can use to get to work. Don't let anyone say they didn't know the bus stopped right in front of the office.

7. Stagger working hours.

Slaggered work hours can help relieve traffic congestion. Less congestion means that cars on the freeway will get better gas mileage.

8. Go to a four-day work week.

Instead of five eight-hour days, try four ten-hour days. Employees will make one less round-trip each week. Discuss it with customers.

9. Set up a ridesharing action taskforce.

Appoint a company taskforce to implement a comprehensive ridesharing program—carpooling, vanpooling and buspooling. Ask for action. Set a timetable for results.

Saving gas saves energy. And saving energy helps protect our economy.

COMMUTER RIDESHARING REGISTRATION

PLEASE PRINT all information. Use only one letter per box. Abbreviate where necessary. Be specific in home and work address.
Example: Is it a Street (St.), Road (Rd.), Avenue (Ave.), etc.? Provide apartment (Apt.) number where applicable.

Yes No Have you ever applied to a Commuter Computer Ridesharing program before?

NAME:

Last Name

First Name

Middle Initial

HOME ADDRESS:

Number and Street

City

Zip Code

Major Street or boulevard intersection nearest your home. (Example: Whishire Blvd. at La Cerreaga Blvd.)

Check here only if you do not want your home address printed on ridesharing materials

HOME COUNTY
(Check only one)

1 Los Angeles
2 Orange
3 San Bernardino
4 Riverside
5 Ventura

Send this registration now for your personal Ride Sharing Matchlist. If you have recently registered through your employer ridesharing program, pass this registration along to a family member or friend.

With dollar-a-gallon gas, the cost of going places is going up.

Especially the cost of going to work.

Here are 5 ways you can help yourself today—and help make transportation more efficient and economical for the future of California.

1. REGISTER TODAY FOR RIDESHARING.

Four people riding to work in the same car automatically gets you 80 travel miles per gallon of gas instead of 20.

Ridesharing can save you gas, wear-and-tear on your car, maintenance expense, insurance costs, bumper-to-bumper stress—a minimum of \$500 to \$2000 a year in cold, hard cash.

And getting a commuter carpool started is easy.

Commuter Computer can help you with a free Ridesharing Matchlist—a personal computer list of co-workers and neighbors who live near you, work near you, and want to try ridesharing, too.

There's no obligation.

To obtain your Matchlist, simply complete and return the registration form in this brochure.

If you have recently registered through your employer ridesharing program, pass this registration along to a family member or friend.

2. START YOUR OWN CARPOOL NOW. HERE'S HOW.

Don't wait.

Do it yourself—just follow these basic steps and you can form a fast, efficient carpool to work in less than a week.

1. Get started.

There are three important factors that have to be coordinated with other commuters when you set up a carpool.

The first is destination—the company, place or area where you work. The second is origin—the neighborhood where you live.

And the third is time—when you leave for work, and when you leave to go home again.

These three factors are often called DOTs for short. And your first step is to locate people who share the same basic DOT as you.

2. Get the word out.

To locate people who share your DOT, you have to pass the word. Here's how to do it.

1. Talk to friends where you work. And put up signs on the company bulletin board, in the lunch room or wherever you think they might be seen. Check other offices and businesses nearby—call their personnel offices, and put up signs on their bulletin boards.

2. Tell your friends in the neighborhood you want to rideshare.

3. Put up signs on neighborhood bulletin boards. The more places you put them up, the more places people will have a chance to see your message. Places that have bulletin boards include supermarkets, drugstores, libraries, park and community activity buildings, churches and schools. While you're putting up your own signs, be sure to read the signs of other people who were there ahead of you—they may be just the people you're looking for.

4. Put up a sign in your front yard. Make it big and keep it simple. If you work in downtown Los Angeles and your phone number is 123-4567, your sign should say "RIDESHARE TO DOWNTOWN L.A. ... CALL 123-4567." Don't put your name on the sign, or the hours you commute. Save that information for the people who see your sign and call.

5. Put a "RIDESHARE TO ... FROM ..." sign in the back window of your car. Include your destination, origin and phone number. Save the information on the hours you commute for the people who call.

6. Advertise in your community newspaper. Include your destination, origin and phone number. And be sure to read the ads of other commuters yourself.

Once you get the word out in enough places, chances are your phone will be ringing with callers. If you've never organized a carpool before, relax—it's easy. And the neighbors and co-workers who call you are probably just as new at this as you are.

3. Get together.

In a few days you'll have located enough commuters whose DOTs are fairly close to yours, and you're ready to put your carpool on the road.

Now is the time to call a brief meeting and agree on a few things:

First, and most important, you should agree to give ridesharing a serious try. Make a commitment among yourselves to make ridesharing work for you.

Then there are technical questions to discuss.

Do you want each rider to use his own car, and simply rotate the driving?

Or does one person want to do all the driving? In which case, you'll have to work out a fair plan for sharing the expenses. This should include gas, parking, maintenance, insurance and depreciation. (Current estimates put the total cost of operating a "new" one- to three-year-old mid-size sedan at about 25.3 cents per mile.)

Everyone who drives a carpool should be sure to check out his auto insurance, and show a copy of his policy to everyone he drives. If you rotate the driving, incidentally, everyone in the pool should be able to obtain a reduction in the cost of insurance—in some cases 10 to 25 percent!

4. Set the rules. And stick to them.

Chances are, you're going to like the people you ride with. Still, every carpool has to have rules. Here are a few do's and don'ts you may want to discuss before you begin.

- Be on time.
- Get gas ahead of time.
- Avoid personal detours, no matter how small.

• Elect a Captain to resolve differences and coordinate changes if the unexpected happens.

• Make sure your car is in good running condition.

- Above all, drive carefully.

5. You're on your way.

Once you've got your DOTs, your people and your rules—your carpool is ready to roll.

If you're like a lot of people, you'll find carpooling is actually easier, friendlier and a lot more relaxing than driving the freeways alone.

And you won't have to worry as much about gas lines.

Incidentally, if just 25 percent of the commuters in our five-county region decided to rideshare to work, it would eliminate over 240 million pounds of solid smog from our air in one year.

3. MAKE THE GAS YOU'VE GOT GO FARTHER.

Less gas doesn't necessarily mean less lifestyle. We can all go a lot farther with the gas we've got if we just learn to drive a little smarter.

Follow these 12 commandments religiously, and watch how far a tank of gas can go.

1. Put less pedal to metal.

Observe the 55 mph speed limit. High speeds reduce gas mileage about 5 percent for each additional 10 mph you drive. Slow down and save.

2. Take care of your car and your car will take care of you.

Keep your car well-tuned. And don't forget to check your wheel alignment. Ordinary out-of-tune operation can reduce fuel economy by as much as 6 percent. Poor engine conditions—spark plug deterioration, carburetor problems, etc.—can raise fuel consumption as much as 20 percent. A well-tuned car can save you enough in gas to pay for its next tune-up.

3. Easy does it.

Fast acceleration and hard braking use about 15 percent more gas than accelerating and braking gradually. Drive at steady speeds, anticipate stoplights, slow down gradually and keep idle time to a minimum.

4. What are feet for?

If you don't have that far to go, try walking. Or riding a bicycle. You'll be surprised how much gas you can save. And let's face it, you need the exercise.

5. Combine short trips.

Don't rev up a couple of tons of machinery just to run to the drugstore. The short trip—two miles or less—that starts with a cold engine wastes astounding quantities of gasoline.

A cold engine operates at greatly reduced efficiency, and causes heavy pollutant emission.

The EPA table below shows that the shorter the trip you take, the less fuel economy you get.

Trip Length (Miles)	Percent of Normal Fuel Efficiency
0.1 (one block)	10% or less
0.25	20%
0.5	38%
1.0	49%
2.0	62%

If you must drive combine all the short trips you can. Your engine will stay warm between stops, and operate with better efficiency.

6. C'mon, get friendly.

Ask a neighbor to go along when you make those routine shopping trips to the supermarket,

hardware store and dry cleaners. In fact, before you go almost anywhere, ask a friend if they need something picked up. You'll help cut those routine gas-guzzling trips in half. And your friends will think you're terrifically thoughtful.

7. Dump the junk in your trunk.

It's a fact—light, trim cars get better mileage than fat heavy cars. Gasoline mileage is reduced by 1 to 2 percent for every 100 pounds of added weight.

8. Are you driving a car or a mobile air conditioner?

Here's the good news about air conditioning. If you're going 55 mph, it's okay. And now the bad news. If you're driving at slower speeds, or in stop-and-go summer traffic, using an air conditioner decreases your gas mileage by 9 to 20 percent. So if you can, turn off the air and open the window.

9. Check your tires.

Underinflated tires reduce fuel economy by 0.5 to 1.5 percent. And radial tires generally produce better gas mileage than normal bias ply tires by up to a mile per gallon.

10. Go synthetic.

Try the new synthetic oils. They cost more, but they last longer, reduce engine friction—and increase mileage.

11. Drive lean. And clean.

Adjust your carburetor to the leanest possible fuel mixture, and keep it adjusted. Clean your air filter frequently, too. Remove any unnecessary exterior attachments like ski and luggage racks. Even a good coat of wax will help cut wind resistance, improve mileage.

12. Don't idle.

Unless you've stopped at a traffic light, turn off your engine if you're going to be idling in the same spot for more than 30 seconds. You'll use less gas to restart your car than to keep it running.

4. CHECK IT OUT. THERE'S A BETTER WAY TO GET THERE.

Take a good look at all the alternatives. There are at least seven good ways you can get to work without wasting a lot of gas.

One of them will work for you.

1. Vanpooling.

In addition to ridesharing, Commuter Computer can help you join a fast, convenient vanpool. The vanpool program is designed primarily for commuters who travel to work longer distances. For more information, call Commuter Computer.

2. Public Bus Service.

Over 250,000 commuters now enjoy public bus service to work in our five-county region every day. You'd be surprised. Depending on where you live and work, it's fast, economical—and more reliable than your own car. Call your local transit district for schedule information.

3. Park 'n Ride.

Both the Southern California Rapid Transit District and the Orange County Transit District now have parking lots where express buses pick up passengers for longer freeway commutes. For information, call the Southern California Rapid Transit District at (213) 626-4455. Or call the Orange County Transit District at (714) 636-7433.

4. Park 'n Pool.

Sixteen special lots, sponsored by CALTRANS, provide centralized parking areas where commuters can meet to carpool to work. Call the CALTRANS office near you for more information.

5. Commuter Rail Service.

Did you know that Amtrak operates a commuter rail service between San Diego and Los Angeles, through Orange County? They do. Call Amtrak for more information at (800) 648-3850.

6. Private Commuter Bus Service.

If you live in an outlying area, or you can get enough passengers together wherever you live, you can call a private bus service and arrange for a private bus to get you to work. It can be very economical. Your local private bus company can give you suggestions to help you get your private service organized. They're listed in the yellow pages. Or for more information, just call CALTRANS.

7. Try walking. Or riding a bike.

If you live less than 3 miles to work, you should give serious consideration to walking to work. If you don't care to walk, try riding a bike. It's another great way to get exercise. And depending on your route and distance, it can be almost as fast as a car. Plus a lot easier to park.

COMPANY NAME:

WORK ADDRESS:

Number and Street

City

Zip Code

Major street or boulevard intersection nearest your work. (Example: Hollywood Blvd. at Vine St.)

WORK COUNTY: (Check only one.)

1 Los Angeles
 2 Orange
 3 San Bernardino
 4 Riverside
 5 Ventura

NORMAL WORK HOURS: BEGIN WORK LEAVE WORK

Hour Minutes Hour Minutes Hour Minutes Hour Minutes

1 a.m. 2 p.m. 1 a.m. 2 p.m. 3 a.m. 4 p.m.

(Check one.) (Check one.) (Check one.) (Check one.)

PHONE NUMBER: Home or work number where you may be reached (213) (714) (805)

Area Code (Circle one). Phone Number

Extension (If Any)

If home phone, check here

NORMAL TRAVEL METHOD: How do you usually travel to work? Check only one.

1 Auto, Driving Alone 2 Auto Carpool 3 Public Bus 4 Motorcycle

5 Commuter Van 6 Commuter Bus 7 Other _____

RIDE SHARING: You will receive free information on regular ridesharing opportunities now available to you, and a list of other interested people who live and work near you.

Yes, No

1 2 Do you have a car available for carpooling?

COMPUTER USE ONLY

Home Grid

Work Grid

VPI Yes No

PROGRAM 1 2 10 12 15

SIGNATURE: _____ **DATE:** _____

Write. Do not print.

Commuter Computer, 3440 Wilshire Blvd., Suite 610, Los Angeles, CA 90010. Phone (213) 390-RIDE / Orange County: (714) 834-RIDE / San Bernardino County: (714) 825-RIDE / Riverside County: (714) 664-RIDE / Ventura County: (805) 647-RIDE.

Send this registration today for your personal Ridesharing Matchlist. It costs you nothing. And it can help you get to work.

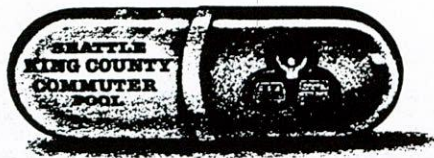
For more information on Commuter Computer ridesharing registration and matchlist services, contact your company's Personnel Office.

Commuter Computer is a non-profit corporation providing both commuter ridesharing services and regional emergency ridesharing services in Southern California, and is funded primarily by CALTRANS, the Southern California Association of Governments, and the five counties of the South Coast Air Basin.

For additional information on other ridesharing opportunities in your area — including car, van, bus and taxi ridesharing opportunities — contact Commuter Computer. In Los Angeles County call 380-RIDE. In Orange County 834-RIDE. In San Bernardino/Riverside Counties 825-RIDE. In Ventura County 647-RIDE.

Commuter Computer, 3440 Wilshire Blvd., Suite 610, Los Angeles, CA 90010.





the Capsule Relief for Commuter Congestion

WHY BE FUMIN' WHEN YOU COULD BE ZOOMIN'?

Identify the problem, research and implement the solution, and promote, promote, promote. These are the simplified steps to a successful target market campaign. As revealed in the following case story, target market campaigns are especially effective in encouraging ridesharing.

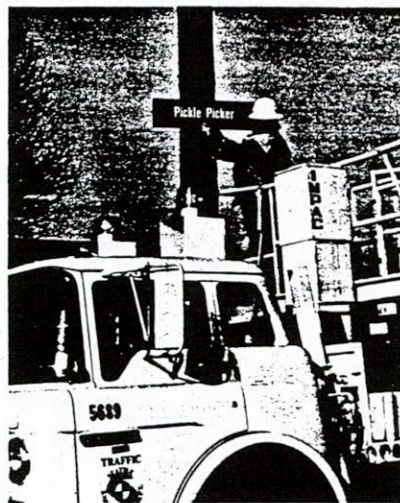
The average number of people per vehicle increased by 22% during the peak 15 minutes!

On June 11th, 1978, the West Seattle Bridge was struck by a tug-assisted ship. Consequently, half of the bridge, spanning the industrially busy Duwamish River and linking the 100,000 residents of West Seattle with the rest of the city, was stuck in the up position. The new West Seattle Bridge will not be completed until the latter half of 1984. Traffic congestion during peak hours was considerable before the bridge incident, and now, with only four of the eight bridge lanes operational, the situation has worsened.

To combat the severe traffic congestion, high occupancy vehicle lanes were implemented to the approaches on both sides of the bridge to encourage ridesharing and cut down on vehicle trips. However, another traffic problem was yet to be solved. Located adjacent to the West Seattle Bridge is Harbor Island, with employers ranging from giant Todd Shipyard with over 4,000 employees to small businesses with only ten or twelve employees. Because of the nature of the work (shipbuilding) done on Harbor Island, the majority of employees have the same quitting time. Consequently, there is a

rush to be first on the roads leading to the main thoroughfare.

When construction of the new bridge began, and Harbor Island traffic was rerouted, the 4 p.m. rush turned into the 4 p.m. crush. It was not unusual for a commuter to spend 45 minutes creeping along a mere two miles.



"Burma Shave" style signs promoting carpooling popped up all over Harbor Island when the FAST LANE opened. How does "Pickle Picker" fit in? You'll have to read Why Be Fumin' When You Could Be Zoomin' to find out!

To ease the congestion problem, the Seattle Engineering Department, Commuter Pool and the Harbor Island Improvement Association joined forces with the common goal of reducing the number of vehicles coming onto the island.

The City implemented a high occupancy vehicle (HOV) lane on the main road exiting Harbor Island. The lane is for the exclusive use of carpools of three or more, vanpools and bus riders.

To promote the use of the HOV lane, a unique marketing campaign was designed and implemented by Commuter Pool. The technical sounding term "High Occupancy Vehicle Lane" was replaced with the more marketable "FAST LANE." A road-runner, resplendent in hard hat and dubbed "Zoomer," was adopted as the FAST LANE symbol. Zoomer appeared on all targeted brochures, buttons and posters, as well as on the unusual signing method used to promote the FAST LANE.



Harbor Island Improvement Association employees appointed Employee Transportation Coordinators who were trained in ridesharing concepts and promotion at a Commuter Pool "Talkshop." This Talkshop was hosted by Leckenby, an island employer. Unions on the island were most cooperative. The Seattle Metal Trades Council printed articles in their newsletter, posted bulletins, and made announcements at meetings about ridesharing and the FAST LANE.

The signing campaign was modeled after the popular "Burma Shave" advertising of the 1930's, 40's and 50's. Red 12" x 40" signs (see photo) with bold white lettering heralded the advantages of the FAST LANE with catchy poems like . . .

When Peter Piper

Pickle Picker

shared a ride

he got home quicker

In the FAST LANE.

and,

You think you're cool

riding alone

but if you

carpooled

you could

be home

In the FAST LANE

Six sets of poems, a total of 37 signs in all, were posted along routes where the traffic habitually was stop and go.

Did all this hoopla succeed? Was the number of vehicles coming onto the island reduced? A recent vehicle occupancy study revealed that the number of commuters in vehicles of three or more jumped from 10% to 20%; and the average number of people per vehicle increased by 22% during the peak 15 minutes! What does all this mean? Share your ride — with three or more — you'll get home faster — than before — In the FAST LANE!

VANPOOLING PROGRAM A SUCCESS

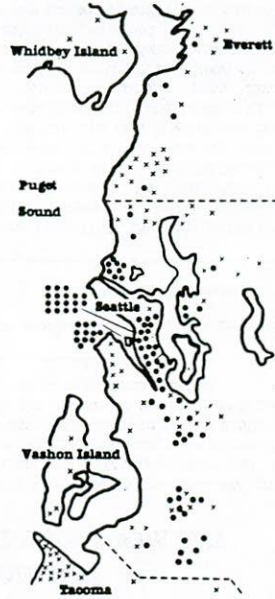
"I think Commuter Pool's vanpool program is terrific. The convenience, comfort and companionship can't be measured in dollars." This comment is typical of those made by the more than 1,000 vanpoolers who responded to a Commuter Pool survey conducted last December. In this extensive 10 page survey, 87% of the respondents rated Commuter Pool's vanpooling program from good to excellent.

The most important effect an employer can have on an employee's decision to vanpool is a flex-time policy.

Commuter Pool's vanpool program currently serves over 1,544 commuters daily with 118 Commuter Pool owned vans. Commuter Pool lends

luxury vans to groups of commuters who will share the ride together rather than drive their cars alone. Volunteer commuter drivers ride for free and have personal use of the vans for 21¢ a mile. Riders split fixed and operating costs of the van. As a result of this program, 784 cars have been removed from local commuter traffic, 2.4% of those vanpooling have sold the car in which they previously commuted and 13% have deferred purchase of a new car.

Commuter Pool Vanpools Origins and Destinations



1" = Approx. 10 Miles

Origin = x
Destination = o

Not shown because outside map area -
3 Origins 6 Destinations

Money saved is rated as the number one reason for vanpooling. The survey shows the average monthly vanpool fare to be \$40.62. This represents a monthly savings of \$26.47 over the perceived

costs of vanpoolers' previous modes of commuting. As one vanpooler commented: "It's half the price and wonderful companionship." The convenience of not having to drive is rated as the second reason for vanpooling. 65% of our poolers rated vanpooling as more enjoyable than their previous commute mode. Interestingly enough, most vanpoolers previously drove alone (35%) or carpooled (48%). Other motivations to vanpool, in their order of priority: good use of commute time; lack of adequate bus service; a comfortable ride; guaranteed parking; time saved; and finally, priority loading on ferries.

The survey shows the average vanpooler to live 27.4 miles from his or her place of work, travel 5.2 miles to a vanpool pick-up point, most commonly a Park and Pool/Ride lot, and spend on the average 10 minutes more commuting time each day by vanpool than by their previous mode of commute. Even though more time may be spent vanpooling, most poolers agree, "The trip seems shorter with company."

The survey revealed the most important effect an employer can have on an employee's decision to vanpool is a flex-time policy. Flex-time is a system of varying work hours in which employees are given some responsibility — and choice — for their starting and quitting times within their eight hour work day. The more flexible an employee's hours, the more likely he or she is to commute using a ride-sharing mode such as vanpooling. Other significant employer incentives are employer sponsored vanpooling and restricted employee parking.

2.4% of those vanpooling have sold the car in which they previously commuted and 13% have deferred purchase of a new car.

Who vanpools? Most work in professional (42%) or semi-professional (16.6%) positions, others are clerical workers (16.6%), skilled blue collar workers (10.8%) and a variety of other occupations (14%). Their employers are manufacturers (33.4%) like Boeing and Todd Shipyards, the government (19.9%), commercial companies such as banks and insurance companies (19.9%) and other organizations (19.9%). Vanpoolers generally work for employers with 250 or more employees (66.9%) with a large percentage (33.8%) working for employers with 1,000 or more employees.

Most importantly, those who vanpool like it: "The vanpool I am in is great . . ." "It makes life much more convenient for me . . ." "I really appreciate this energy saving program." At a time when energy conservation and traffic congestion are key problems, vanpooling stands out as an important element of the solution.

Guindon

BAD ENERGY SAVING IDEAS: NO. 26
DRIVING A CAR WITH THE LIGHTS OUT.



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LET'S PLAY THE NAME GAME!

Maureen Danner has been receiving THE CAPSULE for over a year. That is to say, we think her name is Maureen Danner. Our computer spelled her name every way possible, until she cleverly brought it to our attention.

This leads us to ask you, are we spelling your name properly? How about your address? Does

our computer have it the way you want it? Maybe you're one of the lucky people who always receives more than one copy of each issue. If any of these are true, tell us! Misspelled name? SEND US THE NEWSLETTER MAILING LABEL with the correction marked. New address? SEND US THE NEWSLETTER MAILING LABEL with the appropriate changes. Receiving too many copies? SEND US THE NEWSLETTER MAILING LABEL of the one to delete.

We don't expect a poem like Maureen's, but if you have a question or suggestion about ride-sharing you'd like to share, please let us know! Address any inquiries or comments to Heidi Stamm, Commuter Pool, Room 600, 704 - 3rd Avenue, Seattle, Washington 98104, or call (206) 625-4651.

COMPUTER POOL NAME GAME

There it was On Friday morn, On my desk A new name born!	And on Wednesday — Keeping in this manner, Reserved it is For Morine Banner!
Danner to Donner And now to Banner If it keeps going I'll need a name scanner.	Thursday I will Just hold free, In case is born Another me.
I think I know Just what to do, I'll split the week — And be people new!	But on Friday It must be my way, MAUREEN DANNER Name of the day!
On Monday I'll be Moreen Bonner On Tuesday I'll be Morine Donner.	The week-end I claim All for me, And then most folks Just call me Lee!

by Maureen Danner (the real me)

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**SEATTLE-KING COUNTY
COMMUTER POOL**
Seattle Department of Engineering
Room 600, Arctic Building
704 Third Avenue
Seattle, Washington 98104

If Undeliverable As Addressed
Do Not Forward
Return Postage Guaranteed
Address Correction Requested

BULK RATE
U.S. POSTAGE
PAID
SEATTLE, WA
Permit No. 2871



INSURANCE FOR THE RUSH HOUR BLUES . . . SAFECO STYLE

The 22 story Safeco Insurance Tower, a neighborhood landmark since 1973, looms over the surrounding delicatessens, boutiques, bookstores and second-hand record shops which dot the University District in Seattle. Safeco employees, too, are easy to single out among the "U" District throng. White shirts, conservative suits and decorous dresses seem even more businesslike when merged with the blue jeans and Izod shirts sported by many of the 35,000 neighboring University of Washington students.



The morning parking rush in the "U" District reaches a fevered pitch by 8 a.m. However, it is

highly unlikely one would spot a Safeco employee cruising the street, searching in vain for a parking space. True, Safeco operates a total of 900 parking slots reserved only for employees; but the fact is, many employees don't need a parking space. Of the 1800 people working at Safeco headquarters, more than 1200 employees share their rides. Much of the credit for this high percentage goes to Safeco administration.

Safeco believes in providing incentives for its ridesharing employees. There is no free parking for Safeco employees, but **carpools of two or more qualify for a reduced rate. Free in-house ridesharing** is continuously promoted and used by

Of the 1800 people working at Safeco headquarters, more than 1200 employees share their rides.

employees to start their carpools. **Reduced rate bus pass sales** have seen a marked increase. Assistant Purchasing Manager Nat Spadafora equates this with the high cost of fuel and improved Metro bus service. "This last year the number of Safeco employees buying bus passes has skyrocketed. In fact, our bus pass sales have tripled since January of 1979." Currently, more than 600 employees



Program Manager: William T. Roach
Editor: Heidi Stamm Design: Allen & Associates

take advantage of the Safeco reduced rate bus pass program.

A year ago, after much study, Safeco began a pilot **vanpool program** in Seattle, and the concept soon spread to several of its division office cities. In Seattle, six vans, traveling a daily total of 330 miles, are currently in operation, and Spadafora reports there is potential for an additional pool. Safeco's vanpool program operates much like others in the area. The company owns the van and charges riders fixed and operating costs. The driver rides for free, the back-up driver rides for half fare. Personal mileage charges are the same as for a company owned car.

According to Spadafora, the ridesharing program will probably be expanded when a new Safeco facility opens in Redmond, Washington later this year. Because employees transferred to this new site will be changing their commuting routes and habits, ridesharing is an important transition element. Bus service is not as convenient to outlying Redmond as it is to the densely populated University District, so carpooling and vanpooling will be called upon to fill the gaps.

Van Pooling relieves pump pressure.



The Pink Panther, star of Safeco's advertising campaigns, promotes vanpooling, too!

Questions concerning Safeco's ridesharing program should be directed to Heidi Stamm, Commuter Pool, 704 - 3rd Avenue, Seattle, Washington 98104.



COMPARISON OF COMMUTING OPTIONS

As gas prices continue to rise, ridesharing can cut commuting costs and fuel requirements.

Increase in Cost of Gas

Comparative Additional Cost Per Month, Per Person*



	Single Occupant	3 Person Carpool	11 Passenger Vanpool
.00/gal.	\$.00	\$.00	\$.00
.10/gal.	7.00	2.33	.95
.20/gal.	14.00	4.67	1.91
.30/gal.	21.00	7.00	2.86
.40/gal.	28.00	9.33	3.82
.50/gal.	35.00	11.67	4.77

Fuel Savings

Annual Fuel Requirements in Gallons of Gas to Transport 11 Commuters*

Single Occupant	3 Person Carpool	11 Passenger Vanpool
9,240 gallons	3,080 gallons	1,260 gallons

*Assumes 50 mile day round trip @ 15 MPG for a car and carpool, and @ 10 MPG for a vanpool.

Source: RIDES for Bay Area Commuters, Inc. San Francisco, CA
Golden Gate Bridge Highway and Transportation District, San Francisco, CA

Commuter congestion is curable! Please send me more information about:

- carpooling and ridesharing services
- Commuter Pool Vanpooling Employer Sponsored Vanpooling Do It Yourself Vanpooling
- flexible working hours
- parking management
- speakers available through Commuter Pool
- please have Metro Transit contact me about their services
- please invite me to a Commuter Pool Talkshop (list name below)

We will use your address on our mailing label unless otherwise specified.

My friend has the rush hour blues. Please add to your mailing list:

Name: _____

Address: _____

City _____ State _____ Zip _____

APPENDIX C

VANPOOL PROGRAM SUPPLEMENT

This appendix provides the following supplemental information on starting vanpool programs:

- Vanpool financing and insuring and merchant discounts
- Vanpool abort agreements
- Vanpool funds flow
- Vanpool lease agreements

FINANCING AND INSURING VANS; MERCHANT DISCOUNTS

Both ridesharing agencies and employers have been active for years in seeking favorable loans and insurance rates for their vans, and some ridesharing agencies have successfully obtained discounts on vehicle parts, repairs, and supplies for their poolers. Brief examples of these three types of action are discussed in turn.

Van Financing

In the past few years, a number of banks have offered 100 percent financing for vans after review and approval of the vanpooling programs offered by either an employer sponsor or a local ridesharing agency. A projected vanpool funds flow for the first year of operation is usually required, and, in some cases, a vanpool market appraisal for the area to be served by the driver is requested by the bank. The market appraisal is prepared by the employer or RSA. Participating banks include the American National Bank and the United California Bank in California, the Riggs National Bank in Washington, D.C., and others in New Orleans and Tucson.

The most favorable type of loan has the following features:

- One hundred percent financing of van price plus sales tax and first year vehicle registration fee.
- Five-year (60-month) payback period.
- First loan repayment not due for 45 days to permit the driver to maintain a consistent positive cash flow.
- Acceptable interest rates, usually below those offered by a third-party van lessor.
- Simple rather than add-on interest which results in a higher effective interest rate and inhibits refinancing if the van changes hands.
- Transferrability to another person for vanpooling use.

An illustrative loan agreement of this type worked out between one employer and his bank is shown in Table C-1. The agreement has been generalized to apply to any "vanpool service agency" (including a community ridesharing agency) and lender. There may be a question whether an

Table C-1. Illustrative vanpool loan policy agreement.

Between	(vanpool service agency)
And	(lender)
Vanpool Service Agency Agrees to:	
<ol style="list-style-type: none"> 1. Protect Lender against financial loss due to a failure of the borrower to meet payment obligations for a vehicle purchased under the owner operated Vanpool Plan (OOVP). 2. Pay upon demand by Lender any monies due and payable for a vehicle purchased under the OOVP and whose loan is 90 days or more in arrears and against whom action to repossess has been taken. 	
Lender Agrees:	
<ol style="list-style-type: none"> 1. To grant vanpool loans to all referrals by Vanpool Service Agency who apply for a vanpool loan under the OOVP and meet Lender's normal credit rating standards except that normal debt/income ratio standards shall not apply in exchange for recourse to Vanpool Service Agency in the event of loan default. 2. To notify Vanpool Service Agency in writing if a van loan account is 60 or more days in arrears. 3. To provide Vanpool Service Agency with credit approval criteria to be used in deciding borrower suitability for vanpool loans. 4. To grant loans under the following conditions and terms: <ol style="list-style-type: none"> a. Financing shall be 100% of sales tax, license, dealer preparation, and vehicle costs. Vehicle modification costs must be approved by Vanpool Service Agency and if approved will be fully financed. In general, applicants will not be expected to make any down payments toward van purchases. b. First payments shall be due 45 days from date of loan unless the borrower requests a shorter time period. c. Financing shall be extended to five years. d. The financing rate shall be established at or below the Vanpool Service Agency's borrowing rate in effect at the time the loan is made. e. Previously owned vans shall be included, with loan conditions subject to approval as reasonable by Vanpool Service Agency and Lender. f. Loans shall be considered as assumable by other eligible referrals provided the intended vehicle use is vanpooling. 	

employer would want his employees to know the full extent of his guarantee of the loan, so that the employee will feel fully responsible; and if the agreement is negotiated by a community ridesharing agency, it would probably want to seek a general abort agreement from state or federal sources (see App. E for details) rather than backing the loan itself.

Credit unions have also offered such loans, usually at lower interest rates than banks. Examples include those at the Tennessee Valley Authority, those of state government agencies, and those of such federal agencies as the Department of Energy, the Department of Transportation, and the Social Security Administration. In some areas, missionary work by RSAs or employers may be needed to inform the loaner about vanpools.

A little-used source of interest-free loan funds up to 75 percent of the van's cost is FHWA's Federal aid urban funds, which must be repaid in full at the end of the loan period which can be up to the passenger service life of the vehicle. Commuter Pool in Seattle uses this source.

Van Insurance

Annual commercial insurance rates in 1980 ranged from about \$400 to \$700 for owner-operated vans and \$1,000 to \$1,400 for third-party leased vans and employer-owned vans. The range of prices within each type is due both to differences in insurance coverage and differences in the insurance company's perception of the risk, as reflected in its rates.

Insurance coverage recommended for vanpools varies from source to source. The following coverage should be considered (it could be obtained in 1979 for about \$550 or \$46 per month as a private policy for a van as a second vehicle driver 80 miles round trip to work):

- \$50,000/\$1 million bodily injury and uninsured motorist, on the premise that the coverage for both should be equal; if "underinsured motorist" coverage is obtainable, that is also recommended to protect passengers when an underinsured motorist is at fault.
- \$100,000/\$300,000 medical payments, which are important for paying any immediate bills because availability of bodily injury funds requires litigation.
- \$50,000 property damage.
- \$250 deductible collision.
- \$200 to \$250 deductible comprehensive.
- Van rental reimbursement.

Any additional bodily injury liability insurance that is desired can be obtained as "excess liability insurance." At present, because prices and types of coverage are quite variable, it is worth searching about for the best rates. For example, NAVPO, in the summer of 1981, began offering a low-cost vanpool group insurance program for members. To make this insurance more widely available, NAVPO offers it not only to regular members but to affiliates—both organizations and individuals—so that even individual owner-operators with a single van can be eligible. A program of credits can be applied to reduce the premiums even further, depending on such factors as loss experience and individual driving records. For membership information, contact NAVPO (see Section 1.8); for insurance information, contact the NAVPO broker: Fred S. James & Company, 3001 West Big Beaver Road, Suite 700, Troy, Michigan 48084. The state department of transportation may be of service for a state RSA. Michigan, for example, insures vanpool vehicles for its state employee program through its fleet insurance policy administered by its Department of Management and Budget.

Merchant Discounts

Discounts on van tires, parts, repairs, supplies, and even on vans have been arranged for participating vanpools by several RSAs, and at least one agency (RIDES in San Francisco) is exploring similar possibilities for carpoolers. However, problems of administration and verification procedures would increase significantly for carpools compared with vanpools.

VANPOOL ABORT AGREEMENTS

General

Vanpool abort agreements are used to offer protection to

a van purchaser against cash loss in the event of a forced sale of the van within the first year of operation. It has not been determined that they are essential to the promotion of owner-operated vanpools, although they are effective in helping to overcome apprehensions of prospective purchasers about the risk of sustaining a cash loss in the event of a termination during the first year.

First-Year Risk Assessment

The likelihood of a financial loss on the order of \$500 to \$1,000 if a vanpool aborts in the first year of operation is significant. The likelihood of such an occurrence within the first year, however, is very remote.

By design and intent, the typical vanpool van is purchased with full 5-year financing and no cash deposit. Let us assume a scenario in which Joe Blotz purchases a 15-passenger van through a vanpool program dealer at \$12,000. Adding 6 percent sales tax and \$150 vehicle registration fee increases this to \$12,870. Through the special vanpool program Joe is able to finance the entire \$12,870 purchase cost at 5-year 100 percent financing, at 14.5 percent simple annual interest. Joe's monthly van payments are about \$300, roughly two-thirds of which initially constitutes interest charges.

Joe has a typical vanpool route of 75 daily round-trip miles, or 1,600 miles per month. In addition, his personal use of the van averages 100 miles per week and makes the total 2,000 miles per month.

After 6 months of operation, Joe's employer unexpectedly must lay off a number of workers, including Joe and several other riders. Joe is forced to sell the van. Because the van has relatively high mileage (12,000 in 6 months) and an expired 12,000-mile warranty, the van's market value has depreciated 20 percent, or about \$2,500 below the original purchase cost. The loan balance is \$12,870 less approximately \$870 in principal payments, or about \$12,000. The resulting resale is \$10,200, leaving a net difference between the loan balance and sales price of \$1,800. *It is this amount, or 90 percent of this amount up to a specified limit, that is covered by a typical abort agreement. However, Joe has several other assets that reduce his actual loss even further.* In particular, (1) the vanpool has a cash balance in the repair account, (2) Joe can anticipate savings from reduced taxes due to deduction of interest charges, (3) the pool has a contingency fund accumulated at \$5.00 per rider per month, and (4) there are cash savings from Joe's 6 months of free commuting. The resulting net loss is thereby reduced to \$400, calculated as follows:

(\$1,800.00)	Loss through sale
+300.00	Repair account balance
+400.00	Savings from reduced taxes
+400.00	Contingency fund from rider fares
+300.00	Savings from Joe's 6 months free commute
\$ 400.00	Joe's approximate net cash loss

Each month beyond the first 6 months, Joe's loss potential is reduced as all of these plus values increase while the rate of vehicle depreciation decreases. In fact, during the second 6 months of the first year, rider fares can be reduced by slowly liquidating the contingency account so that by the end of the first year (the vanpool "establishment period"), the

contingency fund and the need for it are simultaneously reduced. Availability of an abort agreement could reduce or eliminate the need for the contingency fund.

Advantages of Abort Agreements

Abort agreements are valuable in promoting driver-owned vanpools. Most abort agreements offer deliberately limited protection for the prospective vanpool purchaser. They are limited in three major ways:

- By time (usually protects through the first year only).
- By circumstance (protects for the specific instance of lack of sufficient riders).
- By liability limit (protects usually to a \$1,000 to \$2,000 maximum limit).

The abort agreement is an extremely effective tool for reducing the time between identification of a vanpool market and its subsequent transition to operation. The abort agreement's value to a program diminishes as the program matures, because the apprehension among prospective vanpool operators is greatly reduced by others' success. Its value to programs today is also diminished by the fact that as fuel costs have risen, the price competitiveness between vanpool fares and the perceived shared costs of 4- and 5-person carpools has greatly diminished over just 1 or 2 years ago. (The sub-formation of large carpools within a vanpool group posed one of the greatest psychological fears of a prospective purchaser because these perceived costs were "close" to vanpool fares.)

The abort agreement works to the vanpool program's advantage in several ways:

- It is a very concrete demonstration of organizational support, and, as a result, the credibility of the program is substantially enhanced as a result.
- Because the agreement is a two-party agreement, the protection is "assignment" by the vanpool purchaser to a financial lending institution. The lender, viewing this as additional protection for the loan, may offer better rates or terms, or may reduce its debt/income ratio in determining the borrower's qualifications for obtaining the loan.
- Most vanpool purchase decisions become a family financial matter, to be agreed on by both adult members of a household. Generally, one (the employee) may have difficulty convincing the other family partner of the true risk involved. The other family member generally has far less exposure to the vanpooling concept than the employee. The abort agreement often provides the most effective means of reducing the reservations of the second member of the household business partnership.

Vanpool abort agreements have been offered by employers and by ridesharing agencies, sometimes backed by Federal-aid urban system funding and sometimes by state funding (or the promise of state funding if needed). Sample abort agreements can be obtained from VANGO in Maryland and Knoxville Commuter Pool.

VANPOOL FUNDS FLOW

In the following a month-by-month estimated flow of funds

for the first year of a typical owner-operated vanpool is presented, by permission of Ekistic Transportation Systems (the figures do not exactly match data presented elsewhere in the manual). Such an estimate is useful for the driver's loan application and setting fares.

The first year of a vanpool's existence is generally considered an establishment period. Riders and driver alike are new, the vehicle is under warranty, and maintenance funds for future repair and replacement expenses begin to accrue. The financial objective is to maintain a constant positive cash flow.

Assume a shared-expense vanpool operating a 75-mile daily round trip, with the following monthly fixed costs:

\$275.00	Van loan repayment
42.00	Insurance, paid in advance in 6-month installments
13.00	Vehicle registration fees, paid in advance yearly
<hr/>	
\$330.00	

Monthly operating costs are \$205 (75 miles/day, 21 days/month @ 10¢/mile for gas and 3¢/mile for maintenance), bringing total monthly expenses to \$535.

Suppose that a van is delivered in time for an October 1 start of service. The first year's registration fee of \$149.00 is included as part of the vehicle financing. The first van payment is due 45 days from October 1, the date of the loan. The first year cash flow forecast might look like Table C-2.

VANPOOL LEASE AGREEMENTS

Third-party lease agreements with firms such as Van Pool Services, Inc. (a division of Chrysler Corporation) and Van American Network (Van, Inc.) may be improvable when they come up for renewal. Three issues with which we are familiar are whether the van is leased "dry," such that the driver pays for gasoline; whether the lease requires a deposit by the RSA to guarantee lease payments; and whether better financing terms can be obtained locally than through the lessor.

Leasing dry has two advantages: the leasing company does not have to account for (and charge for accounting for) numerous bills for gas, and the lease component of fares is more stable because the driver adds the unstable cost of gasoline to his fares, or makes an allowance for their inflation, independently. The 1979 Van Pool Services contract with the California Department of Transportation has such a provision. However, some RSAs may still prefer that leases include gasoline to give them better information on, and control over, the total van fares.

Van Pool Services will make lease agreements without stipulation of an RSA deposit for guarantee of lease payments (typically \$500 per van). Both Chrysler and other lending agencies require that Van, Inc. include such a provision in their leases, which has put Van, Inc. at some competitive disadvantage. In its current negotiations with VANGO, Van, Inc. has agreed to drop the guarantee requirement, but this is by a special arrangement that will probably not apply to other leases. It seems that some creative approach to this problem is needed that would substitute a type of van abort

insurance provision for the present expensive practice that requires an investment of \$500 per van by RSAs.

With respect to van financing, it seems that better local financing might be available in some cases than the rates offered by the national leasing companies. Leasing, after all, is only an alternative method of financing the vans, and it has the disadvantage to some prospective van drivers of payment only down to an assumed residual value. The alternatives might be:

- Substitution of local, 100 percent financing arrangements entirely for the lease agreement in cases where individual drivers prefer that plan.
- Use of local financing for the lease agreement at the election of the ridesharing agency when better terms can be obtained than the blanket lease agreement.
- Substitution of a local lease financing agreement entirely for the national agency agreement, if better terms can be obtained.

In the first alternative, the driver becomes an owner rather than a lessee, losing the advantage of being able to withdraw from the lease on 30 days notice but gaining other advantages of owner-operated vans (see Section 4.3). The second arrangement is acceptable at least to Van, Inc. The feasibility of the third option can probably best be established through competitive bid procedures.

One of the unresolved problems in both leasing and RSA purchase of vans is the storage or "floor" charge by dealers, currently about \$2/day, for vans that are ordered and in stock but not yet delivered. These charges can mount rapidly where large numbers of vans are in the pipeline, but cutting orders too close risks nonavailability of vans when needed and frustration or dispersion of the vanpool members. The best advice is probably to keep a little ahead of actual orders, but not too far.

A list of firms known to be in the van leasing business follows:

Van American Network, P.O. Box 1786, Wheaton,
MD 20902 (301) 468-6640; Mitch Sanaroff

Van Pool Services, Inc. (a Chrysler subsidiary), P.O.
Box 1919 CIMS 416-15-22, Detroit, Michigan 48231;
Tom McDonald

Automotive Rentals, Inc., 444 West New Kings Hwy.,
Maple Shade, NJ 08052; Harry Smith

Hertz Vanpooling, 660 Madison Ave., New York, NY
10021 (212) 980-2275 (call collect); or 205 the Strand,
Alexandria, Virginia 22314, (703) 549-3404

Commercial Credit/McCulloch Leasing, 30803 Little
Mack Ave., Roseville, Illinois 48066, (313) 296-4200;
William Wise

Table C-2. Estimated first year vanpool cash flow.

Date	Transaction	Amount	Balance
Oct 1	Rider collections	\$535.00	535.00
Oct 10	1st 6-mo insurance installment	-252.00	283.00
Oct 30	Oct gas outlay	-160.00	123.00
Nov 1	Rider collections	+535.00	658.00
Nov 15	1st van payment	-275.00	383.00
Nov 30	Nov gas outlay	-160.00	223.00
Dec 1	Rider collections	+535.00	758.00
Dec 15	Van payment	-275.00	483.00
Dec 30	Dec gas outlay	-160.00	323.00
Jan 1	Rider collections	+535.00	858.00
Jan 10	6,000 mi servicing	-75.00	783.00
Jan 15	Van payment	-275.00	508.00
Jan 31	Jan gas outlay	-160.00	348.00
Feb 1	Rider collections	+535.00	883.00
Feb 15	Van payment	-275.00	608.00
Feb 28	Feb gas outlay	-160.00	448.00
Mar 1	Rider collections	+535.00	983.00
Mar 10	2nd insurance installment	-252.00	731.00
Mar 15	Van payment	-275.00	456.00
Mar 31	Mar gas outlay	-160.00	296.00
Apr 1	Rider collections	+535.00	831.00
Apr 15	Van payment	-275.00	556.00
Apr 25	12,000 mi servicing	-75.00	481.00
Apr 30	Apr gas outlay	-160.00	321.00
May 1	Rider collections	+535.00	856.00
May 15	Van payment	-275.00	581.00
May 31	May gas outlay	-160.00	421.00
Jun 1	Rider collections	+535.00	956.00
Jun 15	Van payment	-275.00	681.00
Jun 30	Jun gas outlay	-160.00	521.00
Jul 1	Rider collections	+535.00	1056.00
Jul 15	Van payment	-275.00	781.00
Jul 31	Jul gas outlay	-160.00	621.00
Aug 1	Rider collections	+535.00	1156.00
Aug 10	18,000 mi servicing	-125.00	1031.00
Aug 15	Van payment	-275.00	756.00
Aug 31	Aug gas outlay	-160.00	596.00
Sep 1	Rider collections	+535.00	1131.00
Sep 10	Annual DMV renewal	-149.00	982.00
Sep 15	Van payment	-275.00	707.00
Sep 31	Sep gas outlay	-160.00	547.00
Oct 1	Rider collections	+535.00	1082.00
Oct 10	6-mo insurance installment	-252.00	830.00
Oct 15	Van payment	-275.00	555.00
Oct 30	Oct gas outlay	-160.00	395.00
Nov 1	Rider collections	+535.00	930.00

APPENDIX D

SUMMARY OF DATA, 4-CITIES STUDY—DIFFERENCES BY 4 SITES AND 7 TARGET GROUPS

■ This appendix summarizes how solo driver attitudes toward carpooling and vanpooling differ according to metropolitan areas, occupation groups, commuting patterns, and the sexes. One section is devoted to each of these variables. Sections begin with a note on the sample, proceed through an overview of the attitudinal barriers and facilitators found for ridesharing, and conclude with program recommendations. Only statistically significant differences are mentioned in the discussions of barriers and facilitators, and program recommendations include only those that differ from the ones suggested for solo driving commuters in general as summarized in Section 1.6.4. ■

HOW COMMUTING ATTITUDES DIFFER ACCORDING TO METROPOLITAN AREA

The 4 sites of the study were chosen to provide variations in size, traffic pattern, growth rate, geographical location, and cultural mix: Albany (N.Y.), Houston, Minneapolis, and San Francisco. Generalizing to other metropolitan areas must therefore be limited. Highlighting the point, more differences were found by metropolitan area than any other independent variable studied. This clearly demonstrates the need to assess local populations before determining local ridesharing strategies, as emphasized in this manual.

Albany, New York

Generalizing From the Albany Sample

Albany was selected to represent a relatively small metropolitan area in terms of population; one served by a road system adequate for its traffic flow and growth rate; with one major employer (state government in this case), but diversified employment as well; as a city in the northeast. In addition, and in contrast to the other three sites, Albany reflects an early-to-middle stage of modern metropolitan development. Like Los Angeles of perhaps 40 years ago, the area centers on a city reaching out via highways to incorporate within its metropolitan growth many distant small towns of formerly separate identity. These towns have turned, or are turning, into the nuclei of the typical multi-nucleated suburbs of an American metropolis. Far more than other northeast metropolitan areas, Albany has become a "city for the car" in terms of the lack of public transportation per capita. Public transportation has been deemphasized in the past in favor of those highways in order to connect the far-flung residential, work, and shopping areas. Only the original CBD retains the density common to the older and larger metropolitan areas of the northeast.

Ridesharing Experience and Interest in Albany

People in Albany have carpoled and vanpoled in the past

about as much as the total sample; that is, half have had carpool experience and less than 2 percent vanpool experience. The only difference marking Albany is that far fewer people have been exposed to any vanpool campaigns (4 percent vs. the study average of 25 percent).

The main thing to be said about the interest of Albany solo drivers in ridesharing is that they would prefer to stay as near the familiar as possible. In the forced choice question about nonsolo driving modes, they rated carpooling not only first, but substantially higher than people from any other site (66 percent vs. the study average of 56 percent and the low of 48 percent), and more "voted" for the traditional bus (17 percent) than the unfamiliar vanpool (11 percent). When asked separately about their interest in carpooling and in vanpooling now, their interest was at the medium study average for carpooling (44 percent), but it was lower for vanpooling (34 percent vs. the average of 37 percent).

Ridesharing Facilitators and Barriers in Albany

Facilitators. Albany solo drivers are as keen, even a little keener, than average about meeting others at least once before they would agree to rideshare; and they are as concerned as solo drivers elsewhere to have match methods personalized for carpooling. Nevertheless, they otherwise show remarkably less social concern about poolmates than any other area studied except Minneapolis. This sample runs three to eight percentage points below the average on wanting to carpool or vanpool only with those from their own neighborhood or only with people at a similar job level. (They are 11 percent to 18 percent below the study highs on these measures.)

Apparently people here do not rely heavily on their commute mode for their sense of status. After all, everyone tends to drive to work. They are less responsive than others to the chauffeured aspects of vanpooling (48 percent vs. the average of 57 percent), and think less that either form of ridesharing reduces one's lifestyle. (More of them than solo drivers elsewhere do think that people who are well off tend not to vanpool.)

Albany solo drivers are also not as worried as others about having enough space to carry briefcases or packages when ridesharing. If convenience is not a barrier, however, it is not an outstanding facilitator for Albany as opposed to other sites. It is at the solid study average in interest in ridesharing from a safe park-and-ride lot in order to have cars available for errands and activities before arriving home at the end of the workday.

Parking guarantees for ridesharers may offer an incentive. Although the situation in Albany is not bad, it is not as good elsewhere. Eighty six percent find parking at or near work easily available, while the study average is 93 percent and the high 99 percent. Solo drivers there are a little more enthusiastic than elsewhere that guaranteed parking if you rideshare makes it worth having to leave work at a fixed time each day. (Many, of course, are state government employees who have prompt hours at both ends of the workday in any case.) They are not more responsive than average to highly privileged spots (within 200 ft of the work entrance), and are less responsive than average to ridesharing in exchange for free parking.

Cost, in fact, is a rather mixed factor as a ridesharing motivator in this metropolitan area. When major commute complaints were volunteered, more people in Albany than elsewhere mentioned costs (34 percent vs. the study average of 29 percent and the low of 23 percent). Far more people there agreed that any gas shortages, with their associated price increases, are due only to industry or government manipulation (72 percent vs. the 60 percent average, and the 48 percent low). The latter evidently indicates strong anger since these solo drivers were more reluctant than any others to say that they would rideshare at each of the hypothetical gas price increases mentioned to them, and less interested in ridesharing to gain free parking. They are, at the same time, no more interested than solo drivers elsewhere in ridesharing to save money when the drawbacks of ridesharing (waiting for late members, etc.) are drawn to their attention. It must be recalled, of course, that people in the Albany area pay less for their commutes because of their lower parking costs than those anywhere else studied: \$2.48 per month vs. the study average of \$11 and the study high of over \$15. In summary, gas costs both concern and anger them, and may leave many less open to ridesharing.

“Hassle,” the other great motivating factor found in this study, certainly affects people in Albany, but it does not affect them as much. This should not be surprising in the light of their generous road system. They demonstrated the least spontaneous complaints about traffic congestion (16 percent vs. the average of 28 percent and the high of 41 percent). They also expressed the greatest satisfaction with their commutes (30 percent had no major complaints vs. the study average of 18 percent and the low of 10 percent). They were at the study averages in concern for being late to work (with the greatest concern over carpooling, the least over solo driving). It must also be noted in this connection that these solo drivers reported commutes the briefest in time and the shortest in miles of the study (24 minutes to drive just over 13 miles in the morning).

All in all, the situation of the solo driver in Albany does not appear acutely uncomfortable, except for their concern about costs. Here they are more angry than ready to ride-

share to save money. The attitude may well be influenced by their location in the northeast where heating fuel costs play such a major role in household expenses and consumer alarm. If they are to be attracted to ridesharing, it will be necessary for program strategists to be extremely careful not to appear to place any blame on consumers for the budget bind they are in, or a really severe backlash could result. For the same reason, anything that savors of the possibility of actually forbidding parking to solo driven cars will be especially dangerous here.

Barriers. The two chief barriers are that people in Albany dislike the unfamiliar and that they are very fond, indeed, of the driving process with the sense of mastery and the pleasure that affords them.

1. Albany solo drivers are at the study low in perceiving options to their present commute mode (41 percent vs. the 54 percent average and the 68 percent high in San Francisco). Although this is no doubt influenced by the low level of public transportation, that does not explain why carpooling does not come to the minds of three-fifths. They consistently shy further away from the unfamiliar vanpool than people elsewhere: more of them think it does not provide a relaxing ride; fewer endorse the mode because you can avoid auto repairs; more would only vanpool if they were well acquainted with everyone else in the pool—despite their lack, otherwise, of social concerns about ridesharing. Finally, although they are at the high study averages in preferring personalized outreach match methods for carpooling, on the one point of being interested in being called by “someone” who is forming a carpool (someone unfamiliar, it is assumed), they are more reluctant than solo drivers elsewhere—except for socially sensitive Houston (58 percent would welcome such an approach vs. the average of 63 percent and the Houston low of 52 percent).

2. Their attachment, indeed enthusiasm, for driving is revealed in three measures where they are outstanding among the four sites. Only 14 percent agree that driving alone to work does not provide a relaxing ride. (The study average is 21 percent and the high 37 percent in hassled Houston.) Fully two-thirds maintain that it is a pleasure at the end of the workday to have their own cars in order to enjoy driving them (the study average being 57 percent and the low 48 percent). Finally, more people here feel that as a passenger in a van or carpool, they would not feel safe from accidents (the study average being 32 percent and the low 29 percent).

The Requirements of Albany Solo Drivers for Ridesharing

These are by and large the same as those noted in Section 1.6.4 characterizing solo drivers at all 4 sites, but with certain additions. Cost savings will be attractive in Albany, but only, as discussed above, if great care is taken not to blame solo drivers for the way they have been spending money on their commutes. Neither “leave the driving to us,” nor “enjoy being chauffeured to work in our vans” will be approaches with much appeal. However, if vanpools can be introduced as attractive, comfortable, and reliable, particularly in conjunction with safe (they must always be safe) park-and-ride lots, they may be interesting indeed. Vanpools offer substantial cost savings, and the only bad image to

overcome is that of the old school bus: there are no commuting vanpool failures for which to compensate. The best strategy would probably be to start small with a "hand-tailored" operation in order to guarantee success and satisfaction, then publicize that widely to help create demand.

No major carpooling barriers appear to characterize Albany over and above other sites. Like solo drivers everywhere, those here are intolerant of waiting for late members and of other irritations in carpooling that can be overcome by a combination of carpooling booklets to legitimize rule setting, and coordinators who can make personalized matches, help out with problems, and assist people into new pools when that is necessary.

Houston

Generalizing from the Houston Sample

Houston in this study represents the fast growing sunbelt cities of the south and west, as well as the sharp cultural diversities which characterize many large U.S. metropolitan areas. Growth in Houston has accelerated sharply in the past decade, with little or no urban planning until recently. During the time this research took place, even traffic lights were an innovation in some locales. So explosive has this growth been, that the metropolis actually contains uncompleted activity centers now losing their first tenants because the roads will not support existing traffic. Houston's social mix includes large Hispanic, black, and white populations, and its social class mix is extremely diverse since the rapid industrial and commercial expansions have attracted workers at all economic levels. The total combination, including the speed of growth, means that it is a sociologically unsettled area. The various social and economic groups have had little time to work out comfortable ways of relating to each other. Individuals, as well as groups, feel that wariness of strangers that is the lot of the in-migrant of whatever social class.

Ridesharing Experience and Interest in Houston

Solo driver ridesharing experience in this metropolis differs from the study averages in only one respect: similar to Minneapolis, substantially more solo drivers have been exposed to vanpool campaigns in the past (35 percent vs. the study average of 25 percent).

When it comes to current interest, the vote in Houston goes to private, rather than public, transportation. Unlike the other three sites studied, the appeal of vanpooling appears either equal to or greater than that of carpooling. When forced to a choice among nonsolo driving modes, Houstonians, like the total sample, do rate carpooling highest. However, that 48 percent who chose it is the lowest carpooling rating made at any site, and is seconded closely by the 37 percent who would prefer a vanpool—a full 17 percent above the study average and 22 percent above the study low. When asked separately how interested they might be now in each form of ridesharing, Houston solo drivers demonstrated a vanpooling interest that equals a carpooling interest (43 percent and 44 percent respectively). Again, the vanpool (although not the carpool) percentage outshines that found elsewhere.

These data do not correlate with past experience of the two modes which are at the study averages. (To review, 51 per-

cent of the total sample had carpooled at some time in the past vs. only 1.5 percent who had vanpooled). Houston solo drivers are not indicating preferences along the lines of their own experience. The data do relate in an interesting way, however, to exposure to ridesharing campaigns. In Houston, carpooling interest now and exposure to carpool campaigns in the past are at the study averages of 44 percent and 36 percent respectively. In contrast, interest in vanpooling now is the highest of the four sites (43 percent vs. an average of 37 percent), and Houston past exposure to vanpool campaigns is only equaled in Minneapolis (Houston campaign experience of 35 percent vs. the study average of 25 percent). It can only be concluded that many Houston solo drivers are indeed responsive to the ridesharing campaigns that offer the promise of helping to solve their commuting difficulties and that they show even more potential for vanpooling than carpooling. It also appears clear that vanpool campaigns in Houston have been having effects beyond those measured by number of riders gained.

Ridesharing Facilitators and Barriers in Houston

Congested and expensive Houston is an excellent location for ridesharing programs. Far more facilitators than barriers were revealed, and the most powerful barriers, which are social, can be handled by appropriate program strategies. Solo drivers in Houston are in a painfully ambivalent commuting position: pushed towards ridesharing by the greatest commuting harassments, cost and parking worries, and safety concerns of the study, but held back by equally strong social concerns. Although interest in convenience and the desire for a sense of mastery over the commute are no less visible here than elsewhere, they form no special barrier or facilitator.

Facilitators. Some 41 percent of the open-ended commuting complaints from Houston were about traffic congestion, a proportion approached only by San Francisco (study average 28 percent). While cost comes next in Houston, that site produced the fewest total cost complaints, perhaps because people there have so many other commuting problems on their minds. Hassle is another matter. In addition to the congestion problem, only 15 percent of the mentions indicated satisfaction with the current commute in the sense of "no major complaint." More people in Houston endorsed vanpooling because you avoid a lot of auto repairs: 85 percent. (The study average for this item was also high at 76 percent.) Finally, these solo drivers were the most worried about being late to work whether they drive alone, vanpool, or carpool. As background on the hassle factor, it should be remembered that Houston is not only extremely congested, it shares with San Francisco the dubious distinction of commutes that average longer than half an hour.

Despite the relative lack of spontaneous cost complaints, gas price sensitivity here is the highest in the study as measured by predictions that one would rideshare if gas prices rose to any one of three increasing levels. The range of agreement in Houston runs 72 percent to 78 percent. This is in contrast to the study averages of 62 percent to 73 percent, and the lows of 57 percent to 66 percent. The median income in Houston was no different from anywhere else, but the commute distances are a little longer: 18.4 miles to work in the morning, or some 2 miles further than the study average and 5 miles further than the study low.

Parking costs are also of greater concern here than at the other sites. More Houstonians predict they would turn to ridesharing if that gained them free parking: 72 percent vs. the study average of 64 percent. Parking worries them in other ways. Now the interesting thing is that in Houston, parking at or near work is easily available for 93 percent of those interviewed, a situation bettered only in Minneapolis. Yet, more solo drivers here (66 percent vs. the average of 58 percent) think that guaranteed parking is worth having to leave work at a fixed time each day to rideshare—and this despite the fact that more solo drivers in Houston than elsewhere are embarrassed at the thought of having to excuse themselves in front of co-workers to meet a pool. Furthermore, far more people in Houston would rideshare to gain preferential parking (within 200 ft of the work entrance). Some 62 percent would do so vs. the study average of 47 percent. What appears to be operating was made clear in the Panels: the edginess of people in a metropolitan area where the car glut has spread so fast that they fear today's comfortable parking situation may change tomorrow.

Houston solo drivers show a touch of status concern that really comes out most forcefully in the social factors discussed further below. They are outstanding in this sample for liking the idea of a "chauffeured vanpool" (68 percent vs. the average of 57 percent and the low of 48 percent), although the Panel data suggest that this may relate as much to someone else taking over the driving drudgery on those congested roads as to the admittedly pleasant notion of feeling one is chauffeured to work. Certainly people in Houston are at or near study averages in agreeing that those who are well off tend not to rideshare, but that doing so would not reduce their own lifestyle: a combination that speaks more to their assessment of their own economic position as "not well off" than to status concerns. More of them, however, are embarrassed at the thought of excusing themselves in front of co-workers to pool: 24 percent vs. the study average of 19 percent and the low of 15 percent. This begins again to touch on the interpersonal factors about which they are indeed most sensitive.

Finally, Houston solo drivers are far more concerned about safety from assault than those in the other sites studied. As many as 44 percent feel that solo driving itself is not safe from personal assault (study average 36 percent and low 25 percent), and 43 percent would not feel safe waiting alone on the street to meet a pool (study average 30 percent, study low 21 percent).

Barriers. The great problem with ridesharing in Houston is social wariness, and Houston is outstanding on every measure of it. There is ambivalence even here, however. On the one hand, 85 percent of the solo drivers find that if you have just changed home or work locations, ridesharing could be a pleasant way to meet new people. (The figure is only a little above the study average. This is a notion that appealed to all.) On the other hand:

- More people in Houston than elsewhere would want to meet the others at least once before either carpooling (75 percent) or vanpooling (63 percent).
- More people in Houston than elsewhere would prefer the other people to be from their own neighborhood in a carpool (66 percent) or a vanpool (63 percent).

- More people in Houston than elsewhere would prefer the other people to be working at the same job level as themselves in a carpool (42 percent) or a vanpool (41 percent).

- More people in Houston than elsewhere insist they would have to be well acquainted with all the others before they would agree to carpool (42 percent) or vanpool (32 percent).

In line with the greater vanpool interest expressed by Houston solo drivers, more of them also agreed that vanpooling is better than carpooling because you can choose whether or not to socialize during the trip (39 percent vs. the study average of 29 percent).

Solo drivers in Houston resemble those at the other sites on all vanpooling and carpooling match factors except one: fewer people there than anywhere else would like to be called by "someone" forming a carpool. Presumably, they cannot make an effective judgment of what it might be like to ride with the unknown person, and do not want the social burden of having to decline or to check the pool members out further. For the rest, they too prefer personalized carpool matches and employer vanpool programs more than neighborhood ones, although both were well endorsed.

Requirements of Houston Solo Drivers for Ridesharing

The need for personalizing both carpool and vanpool matches in Houston is acute. This does not mean that the prospective ridesharer will actually need to become personally acquainted with everyone else first, although some kind of workshop meetings about pooling could certainly be helpful in giving people the opportunity to find out something about the others who might rideshare with them. It does mean that highly focused approaches will work well: neighborhood carpool and vanpool programs; executive vans; pools for the sales force; meetings of "workers in the yard" to sign up for either type of ridesharing, etc. In the sociological mix of Houston, legitimizing—indeed providing—guidelines for carpool arrangements and allowable activities within either type of pool (smoking, eating, etc.) will also be important. This can be done via booklets, familiarization meetings, or coordinators. The lower cost of ridesharing, parking rate and/or location privileges, the safety in numbers provided by pooling (as long as the pool meets in a safe location), and the social opportunities that congenial pools offer will all be particularly appealing in Houston.

Minneapolis

Generalizing from the Minneapolis Sample

Minneapolis is a large metropolis with well-diversified industry and commerce in the northcentral area of the country, one that has enjoyed the long development of roads and suburbs typical of many large U.S. metropolitan areas. Three outstanding characteristics are (1) the severe winters, (2) a high level of cultural development, and (3) a population homogeneity remarkable among U.S. cities. There have been no large influxes of in-migrant groups. Sociological change has instead been along the lines of upward mobility within existing ethnic groups. As a result, Minneapolis demonstrates the social stability of many small American cities of the 1930's, that is before World War II set in motion

the mobility of individuals and ethnic groups that has marked the decades since. People there often show an open, frank, and democratic manner quite unlike the reserve frequent in the northeast, or the underlying social wariness of a Houston. Minneapolis, of course, is the site of one of the earliest and best known vanpooling programs, that of the 3M Company, as well as of others. In the Panels, solo drivers appeared quite familiar with vanpooling.

Ridesharing Interest and Experience in Minneapolis

Despite the greater familiarity with vanpooling, there was no more actual vanpooling experience in Minneapolis than elsewhere. Solo drivers here were at the study averages on the measures of ridesharing experience, of carpool campaign exposure, and of joining vanpools or carpools as a result of those campaigns. The one exception was that far more Minneapolis solo drivers had been exposed to a vanpool campaign in the past: 36 percent vs. the study average of 25 percent and the study low of 4 percent—a figure that resembles that of Houston.

Unlike in Houston, however, the greater vanpool campaign exposure is not associated with any above-average interest in the mode. Minneapolis is at the study mean in interest in carpooling now (44 percent) and vanpooling now (37 percent). When confronted with a forced choice among solo driving modes, solo drivers there are also at the study averages in their definite preference for carpooling now (56 percent), followed far behind by vanpooling (20 percent), taking a bus (15 percent) and last a subway were one available (9 percent). A preference for carpooling rather than vanpooling is also suggested by a trend running through social, status, and mastery factors. Fewer solo drivers in Minneapolis would agree that a vanpool is preferable to a carpool because you can choose whether or not to socialize (25 percent vs. the study average of 29 percent). More than average think that those who vanpool are not well off (66 percent vs. the study mean of 57 percent); yet, they do not differ from the study mean on this point concerning carpooling (57 percent overall think that of carpoolers). More in Minneapolis agree that carpooling is better than vanpooling because you have more to say about all the arrangements (69 percent vs. the study average of 65 percent). Finally, the same majority in Minneapolis as elsewhere, 55 percent, agree that what is wrong with vanpooling is that it is too much like taking the bus, with the driver “running the show” and keeping to his schedule rather than yours.

Ridesharing Facilitators and Barriers in Minneapolis

Facilitators. The Minneapolis solo drivers were outstanding in this study for their sociability and open attitude towards others. It is true that they too would like personalized matches, and are at the study averages in rating all but one of the vanpool and carpool match techniques (work site or neighborhood coordinators, computer-matches, lobby locators, etc.). The exception reveals their more open attitude. More solo drivers in Minneapolis than anywhere else but San Francisco would like to be called by an unidentified “someone” forming a carpool (70 percent vs. the study average of 63 percent and the low of 52 percent). Also, people here responded with the study high for finding ridesharing a

pleasant way to meet new people if you have just changed home or work locations (85 percent vs. the mean of 82 percent). Concerning who the other carpool and vanpool members might be, they run consistently 5 percent to 10 percent lower than the average in social wariness. (These measures included for each mode separately: insisting on meeting others at least once before making a commitment; preferring to pool only with people from your own neighborhood; ridesharing only with those with whom you are already well acquainted; preferring to vanpool rather than carpool because you can choose whether or not to socialize.) The only social issue besides the match techniques, where they are at the study averages, are preferences for carpooling and for vanpooling with people at the same job level. These preferences, in any case, were indicated by a little less than a one-third of those interviewed. They were discussed in the manual as something not to be taken at face value because of the widespread reluctance to admit on a survey any opinion that sounds undemocratic. However, the supporting evidence of the Panels and the history of successful mixed social class vanpooling in Minneapolis both support the survey finding here, and suggest that there really is far less wariness between people at different job levels than at the other sites of the study.

Hassles of a few kinds do bother solo drivers in Minneapolis, but this does not include any great concern with traffic congestion. Only 19 percent spontaneously complained of it, 7 percent below the mean. Other commuting harassments have more effect. A few more people here—79 percent vs. the mean of 76 percent—think that vanpooling is good because you can avoid the hassle of a lot of auto repairs. In their spontaneous complaints, the highest Minneapolis proportion clustered in a “varia” category that ranged from “my own schedule is my problem,” to lack of public transportation, to conflicts with other family needs for the car. Ridesharing could certainly alleviate some of these hassles, but hardly all. If solo driving hassles do not impel people here towards ridesharing, however, at least one shared ride concern does not turn them away as much as elsewhere. About the same number here as everywhere, 18 percent, do think that you risk being late to work when you drive alone, but significantly fewer worry about that in a carpool than average (36 percent vs. the mean of 46 percent), or in a vanpool (27 percent vs. the mean of 37 percent).

Minneapolis solo drivers would certainly be interested in cost savings, but no more than other commuters: they are at study averages on all measures. One encouraging sign is that their sense of being victimized by rising fuel costs is low—the lowest in the study. Only 48 percent of these solo drivers agree that gas shortages are caused only by government or industry manipulation, in contrast with the 60 percent overall who think that, and the high of 72 percent in Albany. In using cost saving strategies, ridesharing programs in this metropolitan area will not run a great risk of backlash from solo driver sensitivity to feeling blamed for the commuting money they spend. (Of course, the 48 percent who do feel victimized is not an insignificant proportion, so due prudence should be exercised in any case.)

Mastery issues present a mixed picture. On the one hand, Minneapolis solo drivers are at the solid study averages in (1) liking to drive alone because it is important to them to relax

by themselves (57 percent), and (2) disliking vanpools because they are too much like taking the bus in that you adhere to “their” schedules rather than to your own and the driver “runs the show” (55 percent). Also, as previously noted, more of them here than elsewhere prefer carpooling to vanpooling specifically because you have more to say about the details. Nevertheless, on the survey item that ties mastery most stringently to solo driving, they are below average: only 48 percent (vs. the mean of 57 percent) agree that it is a pleasure at the end of the day to have their car available in order to enjoy driving it—a matter that may have a good deal to do with the long-lasting difficult winter driving conditions.

Finally, safety attitudes should help promote ridesharing. These solo drivers are very slightly above average in concern about personal assault when driving alone (39 percent vs. the mean of 36 percent), while also at the low study averages for concern on the issue if carpooling (19 percent) or vanpooling (17 percent). Fewer of them would feel unsafe waiting on the street to meet a pool (23 percent vs. the 30 percent average). Somewhat fewer would worry about accidents if they were passengers in a carpool or vanpool (29 percent vs. the 32 percent average).

Barriers. It is not that parking attitudes form any barrier to ridesharing in Minneapolis, but the parking realities do not foster it. Commuter parking is more available here than at any other site studied: 99 percent of the solo drivers find it easily at or near work. Also, parking costs are the second lowest in the study, about \$0.50/day on the average. (People here would not reject a parking bargain, of course: 64 percent, the high study average, would rideshare to obtain free parking). Furthermore, fewer solo drivers here than average (53 percent vs. the 58 percent mean) find that ridesharing to gain guaranteed parking is worth having to leave work at a fixed time each day. Finally, despite the winters, somewhat fewer think that highly preferential parking spots are worth ridesharing (44 percent vs. the study average of 47 percent).

The other barrier to ridesharing for Minneapolis solo drivers is a matter of convenience. They are more bothered than most about space for packages or briefcases in a carpool or vanpool. The 62 percent who worry about this are 4 percent to 5 percent higher than the study averages, and 9 percent to 11 percent higher than the study lows. (Like everyone else, 59 percent of the solo drivers here would be bothered not to have their cars immediately available to them during the day, and 53 percent would prefer, were they to rideshare, to do so to and from a safe park-and-ride lot in order to have the car for errand running, socializing, etc., before getting home for the night.) In the Panels of solo drivers, there was much talk of the winter weather and the practice of consolidating commute and other trips. Once you are home for the evening, it is often far pleasanter not to go out again. It was interesting on this score to note in the employer Panels that companies which have successful vanpool programs keep a strict “hands off” policy about where the van goes after the workday. This is left to the pool, and often includes shopping center stops, as well as “downtown” stops for recreational purposes: a cocktail hour, meeting family members or friends for dinner and the theater, etc.

Requirements for Ridesharing in Minneapolis

The reader is referred to the first part of this section since

the solo drivers in Minneapolis produced opinions at the study averages more than those from any other site. In addition to those conclusions, the following can also be said. The match process will probably be easier here than elsewhere because of the open social attitudes, although in Minneapolis also people would like help with the process and some personalization of it. “Leave the driving to us” or “ease your driving chore” approaches should be particularly effective, especially as winter comes on. Winter carpools might even be particularly appealing, and in themselves could save considerable fuel. Cost savings will be a more effective offer than parking privileges. Arrangements for “ride-and-stop” pools may be extremely attractive—perhaps two-day a week shopping center or downtown stops, or whatever arrangements suit the members—the idea may only need to be suggested.

San Francisco

Generalizing from the San Francisco Sample

San Francisco was selected as a large western metropolis at the northerntip of the sunbelt. It has long been a cultural center, with a tradition of absorbing ethnic waves over time into a rich population mix. This population has roots in all parts of the United States; yet, the city’s character remains that of a Pacific metropolis. The city of San Francisco itself is geographically limited by water and by land in such a way that it has developed a peculiar traffic funnel pattern set by the bridges and peninsular highways that link it to its suburbs. Because of those limits, the metropolitan area has reached out to include larger satellite cities than most, far more extensive in size and employment than the usual multi-nucleated suburbs. In effect, ridesharing programs there must be developed, as they already to some extent are, in many major centers. Parking is already so limited and expensive in the CBD that the multiple forms of public transportation and ridesharing are heavily utilized. It is in the less crowded areas of the San Francisco city outskirts and for suburb-to-suburb commutes that the greatest current need exists. Both forms of ridesharing have been promoted extensively in the Bay area, resulting in widespread familiarity with the modes.

Ridesharing Interest and Experience in San Francisco

San Francisco solo drivers reported experience with ridesharing no different from the study averages of 51 percent past carpooling and 1.5 percent past vanpooling. Their interest in using each of these two modes now also reflects the overall figures in which carpools take a lead, 44 percent to 37 percent. The only difference emerged on testing a forced choice among nonsolo driving commutes. Here, although carpooling took the same outstanding lead as at other sites, San Franciscans “voted” more for the subway than people elsewhere—a difference which probably reflects civic pride in the BART system as well as mode satisfaction from what use these commuters have made of it.

A trend runs through the San Francisco data suggesting that many solo drivers here have the attitudes of “late acceptors,” that is of solo drivers whose commuting behavior will be harder to change than the easy first acceptors or the rather easy second acceptors with whom ridesharing programs

quickly become familiar. (It should not be surprising in the light of the extensive carpooling and vanpooling successes in the area that the easiest acceptors would tend to have been reached by now.) The general evidence for this trend is a mixed picture within factors: some solo driving hassle, cost, convenience, mastery, and so on, issues concern these solo drivers, while others do not. More specific evidence includes the following. (1) Despite the restricted and expensive downtown parking and many suburban parking difficulties, 92 percent of those interviewed find parking at or near work easily available. This is by no means the low of the study, and indicates that despite the widespread parking congestion, it is not seriously affecting today's solo drivers there. Indeed they may be the group which does find easy parking in contrast to other commuters. (2) Despite the pervasive traffic congestion, this sample is at the study low in perceiving that to drive alone to work makes you run a risk of being late—only 10 percent thought so vs. the study mean of 17 percent and the high of 25 percent. (3) In both commuter and employer Panels—as well as the daily news—there was considerable talk about increasingly violent crime on the streets. Nevertheless, only 25 percent of this sample think that driving alone to work is not safe from assault, a figure that is again the study low (compared with the mean of 36 percent and the high of 44 percent). Whether this violence is confined to after dark, or these solo drivers enjoy parking in secure lots, or the street crime remains confined to relatively few areas, or it is too new to have changed perceptions as yet, it is not pushing any large number of present solo drivers to group riding. (It is true that even fewer judge carpooling (19 percent) and vanpooling (17 percent) not safe from assault. These are the study averages. The remarkable thing is not that solo driving is seen as 6 percent to 8 percent more dangerous than ridesharing, but that it is seen as less of a danger here than at other sites.) (4) Solo driving costs matter to San Franciscans—it was their second greatest spontaneous complaint after traffic congestion. Nevertheless, they indicated less willingness to rideshare than others at the first hypothetical gas cost increase item, and it was only at the third increase that they ran a little higher than the overall mean—a picture of people reluctant, indeed, to give up their present mode despite their cost concerns. It is no coincidence that this stubbornness is accompanied by the agreement of an angry 60 percent (study mean) that any gas shortages with their associated cost increases are to be blamed only on government or on industry manipulations. Taken together, all these attitudes suggest solo drivers who are most reluctant to give up their present mode—even in the face of admitted high costs, driving hassles on congested routes, and street crime.

Ridesharing Facilitators and Barriers in San Francisco

The question is what might help turn these entrenched solo drivers towards ridesharing, and what holds them back.

Costs, including parking costs, certainly remain a serious consideration, despite the reluctance to accept a mode change should gas go to \$1.75 a gallon. Parking costs here average \$14.74/month, a figure second only to Houston's and \$12/month above the study low. If fewer solo drivers in San Francisco would be willing to rideshare for that first gas hike (57 percent), more would do so to obtain free parking.

They are at the rather high study mean on this point (64 percent). (In contrast, they fall 5 percent to 6 percent below the mean in willingness to rideshare for guaranteed or privileged location parking.)

If the hassles of solo driving do not appear to affect them unduly beyond traffic congestion itself, they also are not remarkable for objections to one type of ridesharing hassle. They rate both carpooling and vanpooling as a more relaxing ride than solo drivers elsewhere. However, they are more worried than people at any other site except the other congested sunbelt city of Houston about being late to work if you vanpool (40 percent, or 3 percent above the mean), but particularly if you carpool (52 percent, 6 percent above the mean). Now, they are less worried than average about being late if they solo drive. Evidently they handle that threat which arises from route congestion by relying on themselves. They appear to distrust others to handle the timing efficiently.

On social issues they present an interestingly mixed picture. It should be looked at in the light of four background points. (1) San Francisco solo drivers are outstanding in this study for perceiving alternatives to their present commute mode—68 percent do so in contrast with the overall average of 54 percent and the study low of 41 percent. This would seem to be a tribute to both the public transportation and the ridesharing programs there. (2) They, like Houston solo drivers, have commutes that average longer than half an hour. (3) San Francisco continues today its traditional process of integrating people from ethnic backgrounds new to the area, but this process is essentially a slow one. (4) Although they would like as much personalized, outreach help as everyone else with the match process, as many here as in friendly Minneapolis—a full 70 percent—would be responsive to being called by “someone” who is forming a carpool.

The findings are these. On the four social wariness measures of wanting to meet others at least once before agreeing to (1) car or (2) vanpool, or wanting the members in either type of pool to (3, 4) be from one's own neighborhood, San Francisco solo drivers run 2 percent to 4 percent more wary than the study averages. While they too find that ridesharing can be a pleasant way to meet new people if you have changed job or home locations, their 76 percent endorsement is less enthusiastic than any other site's—6 percent below the mean and 11 percent below the high. It is also true that they run 3 percent below average on preferring to rideshare with people at the same job level. However, in a metropolis where welcoming the stranger is a tradition, this looks more like verbal compliance with a cultural norm than lack of wariness—a conclusion supported by the Panel data, as well as by the survey items just mentioned. On the other hand, an open western attitude does break through. San Francisco solo drivers are far below average in insisting on being well acquainted with all the others before vanpooling (14 percent vs. the study mean of 20 percent) or even more notably, before carpooling (16 percent vs. the study mean of 28 percent). They were also lower than the study mean in preferring vanpooling over carpooling specifically because one can choose whether or not to socialize (25 percent vs. the mean of 29 percent and the high of 39 percent).

Status considerations in San Francisco appear to favor ridesharing. These solo drivers are less embarrassed than any others to excuse themselves in order to meet a pool: only

15 percent feel that way in comparison with the study high of 24 percent in status-conscious Houston, and 19 percent overall. They are average in finding both that people who are well off tend not to carpool and yet, that the mode would not reduce their own lifestyle—a finding that has been discussed as more of an economic comment about themselves than a matter of status. They are below average, however, in saying that people who are well off tend not to vanpool (50 percent vs. the study average of 57 percent and the high of 66 percent). Clearly, vanpooling has a good status image in San Francisco.

Mastery issues also appear on balance to favor ridesharing somewhat. San Francisco solo drivers are at the study averages in using their commutes to fill mastery needs. That is, a moderate majority, 55 percent to 57 percent, agree that they solo drive because it is important to be able to relax by oneself, that it is a pleasure at the end of the day to have their own cars in order to enjoy driving them, that they dislike vanpools for being too much like taking a bus because it is not your own schedule and the van driver runs the show. However, if the commute itself does not seem extremely important to them to fill basic mastery needs, these solo drivers are hardly passive. More of them than at any site except Minneapolis endorse carpooling as better than vanpooling precisely because you have more say about how long to wait for others, whether smoking and eating are permitted, etc. (68 percent vs. the mean of 65 percent and the low of 58 percent).

They also have some concerns about convenience in a carpool. While these solo drivers are at the study average (57 percent) for thinking that vanpools do not provide enough room for packages or briefcases, as many as 66 percent downgrade carpools for that (8 percent above the mean and 11 percent above the study low on this point).

Finally, safety considerations do not seem to bother them whether they are ridesharing or not. If they are at the study low, as has been mentioned, for fearing assault in solo driving despite the talk of violent street crime, they are also at the study low in worrying about the danger of waiting on the street to meet a pool. Further, few display the quite different concern of not feeling safe from accidents as a passenger in a car or vanpool. All in all, on ridesharing safety issues they are even less concerned than the also sanguine Minneapolis solo drivers.

Requirements of San Francisco Solo Drivers

They will need certain program emphases if they are to be tempted away from using their own cars which are so easy for them to park at work. Major parking cost reductions for pool vehicles can meet some expense concerns and overcome current resignation to solo driving costs. The emphasis must be on a “major” cost benefit because the sheer reduction by one-half or two-thirds that carpooling automatically provides will probably not be attractive enough to accomplish much. (If it were, many would already be pooling.) Because their commutes run longer than half an hour, they should be good ridesharing candidates if their other concerns are also met. Personalized matches, neighborhood coordinator programs, and a familiarization meeting for workplace matches will be helpful. Once San Franciscans have had an opportunity to make a quick judgment of the kind of people

who might be in their pools, wariness should yield readily to their otherwise open social attitudes. Their convenience concerns may best be served by publicizing comfortable-sized vans and by emphasizing small carpools (to leave room enough for packages, etc.). “Be chauffeured to work in our spacious vans” will be an effective approach. However, meetings of prospective vanpool members to determine by group consensus details about schedules and promptness, smoking in the van, any shopping stops, etc., may well also be needed.

“Reduce your driving chores in a reliable carpool” will be attractive, but only if help is given in making promptness a fixed rule. Here, a coordinator who can switch people to more efficient pools may be invaluable as the only firm guarantee worried solo drivers feel they really may have.

If these strategy guidelines appear to require a great deal of ridesharing program staff, it must be recalled that special measures are always necessary to reach those reluctant groups who will be late acceptors if they are to become acceptors at all.

TARGETING OCCUPATION GROUPS

A summary of each occupation group follows. Attitudes distinguishing each group are emphasized, with only general reference to attitudes shared by the whole sample. The categories used of blue collar, white collar, and MEP (managerial/executive/professional) have proven useful because their commute needs, perceptions, and demands differ on many crucial issues. Nevertheless, it must be realized what a broad sweep is involved when all the employed are divided this way into only three categories. Ridesharing programs will be well advised to take a close look at the characteristics of their own specific and various MEP, white collar and blue collar target populations in order to tailor the results presented here to their own consumers. This material is offered as a starting point in that process and to provide a framework of the attitudes and behavioral tendencies of the three broad occupation groups.

The MEPs

A Note About the Sample

Excluded from this sample were those MEPs who are obliged to use their cars during the day to carry out their work at all: field managers, reporters, outside sales personnel, etc. The MEP group obtained is extremely diverse. It includes junior, midlevel, and senior executives and professionals; low level supervisors (as long as they do not share the duties of those they supervise), as well as chiefs of divisions; MEPs with responsibility for large numbers of employees or few, and those responsible only for their own work. (The sample probably lacks a proportionate representation of those MEPs who totally rule out ridesharing for themselves because of either perceived or real inability to predict their working hours.)

MEP Ridesharing Experience and Interest

The MEPs in this study had more carpooling experience (60 percent) than the other two occupation groups (but not more vanpooling experience), and they were outstanding for

having been exposed to more ridesharing campaigns of both types in the past. However, their rate of joining as a result was no different from that of blue and white collar personnel.

MEPs appear the most reluctant to rideshare. In a forced choice situation, MEPs like everyone else, show the greatest preference for carpooling if they were not going to drive alone to work, but it is less than that of other groups. They rate vanpooling and taking the bus at about the same, much lower, level (with the least preference for a subway were one available). When the forced choice is dropped and they are asked to rate their present interest in each of the two ridesharing modes, they are less enthusiastic about either than other occupation groups.

In the "present interest" items, while their preference for the more familiar carpooling shows again (40 percent), the MEP potential for vanpooling (33 percent) looks better than in the forced choice situation (which is also a less realistic situation).

What Favors MEP Ridesharing

The MEPs are the least interested in the driving process which does not appear to be the way they confirm their status or sense of mastery. In fact, they find driving to work in itself more of a hassle than other groups. (The most sensitive measure of attachment to the driving process in this study was the item, "I feel better driving than being driven by someone else." While the MEPs agreed at a high 71 percent level, they were lower even on this measure than blue and white collar employees.) When other commute harassments are considered, they are at the same high level as other solo drivers in endorsing ridesharing if one could use an HOV lane for much of the commute and for the way it permits avoiding so many trips to the gas station.

MEPs appear to have greater social confidence and skills that can make ridesharing easier for them. In a vanpool (but not in a carpool), it is considerably less important to them to meet the others at least once before committing themselves. Fewer MEPs would insist on being well acquainted with all the others in a carpool beforehand, and even fewer in a vanpool.

Unexpectedly, independence of others in commuting is not any more of an issue for MEPs than for any one else: they are at the low study averages in concern about the matter. The only exception occurs when depending on others by ridesharing is tied to leaving work at a fixed time each day, and on that issue they are more sensitive.

Safety (from assault when waiting on the street for a pool or from accidents when someone else is driving) was not of great overall concern. It is of even less concern to MEPs.

Finally, and perhaps because of their considerably more extensive carpooling experience, more MEPs perceive they have alternatives to driving alone to work. They simply do not present the awareness problem to a ridesharing program that blue and white collar employees do.

Ridesharing Barriers For MEPs

MEPs enjoy the same one-to-one (but not better) ratio of cars to licensed drivers in the household as the rest of the sample, and they report more use of their cars for business purposes during the workday, as well as more flex-time. The

main barriers, however, appear to be their resistance to the cost benefits of ridesharing, their status concerns, and their perception that both carpooling and vanpooling are inconvenient. (The inconvenience appears to relate more to the image than the reality of ridesharing.) Furthermore, MEPs, in common with the rest of the sample, perceive vanpooling a hassle to arrange (and are even less interested than others in starting a vanpool themselves). Far more than others, they think the same of carpooling, evidently having had little effective help with matches in the past and/or difficult personal experiences.

Cost. The MEPs in this study enjoy a significantly higher household income than other groups (in the \$30,000 to \$40,000 per year range). Despite the fact that they also pay the most for parking at work—and therefore the most to commute because gas costs were constant—they proved the least interested in ridesharing on all measures that suggested such a mode switch in return for specific cost savings. That included free parking.

Status. MEPs are the least interested in the chauffeured aspect of vanpooling, the most sure that people who carpool or vanpool are not well off financially, and far more embarrassed than other employees to excuse themselves to colleagues at the end of the day to meet a pool. Panel data suggested that this is more a matter of image than realistic difficulty for many and that comfortable executive vans would help a great deal. This is supported by the survey data on convenience.

Convenience. The MEPs were outstanding for perceiving that neither carpools nor vanpools provide enough space "for briefcases or packages." Now this occupation group was running no more personal errands than any other on the way to and from work. Furthermore, they tended to think that neither ridesharing vehicle was particularly "crowded" when the question was phrased that way, and they were more emphatic than others on the point about carpools. What seems to be operating here is a "status/space" concern touched off by the mention of the MEP briefcase. This group does not want to feel that it is being put to an inconvenience that the achieving manager, executive, or professional should be beyond. In this context, it is interesting that the MEPs were less interested than anyone else in the inconvenience of the mode split (ridesharing to a safe park-and-ride lot), which white and blue collar workers like for the errand running and social activity made possible before arriving home after work.

What MEPs Require

This occupation group is just as insistent as every other that they would respond best to active outreach programs which personalize the carpool and the vanpool match. (There is a chance they might form carpools more easily than others because a slightly greater proportion favor 2-person pools. However, as a group they share the study median of preference for 4-person pools.) In common with all solo drivers, MEPs also want a reliable commute, could actively enjoy the social opportunities afforded by ridesharing, and do not mind depending on others to get to and from work.

In summary, this is the most ridesharing resistant group. They share the general solo driver intolerance for waiting for late members, and insistence on having some control over

with whom they will share the ride. They differ from other solo drivers in not being very responsive to the cost savings of ridesharing. Furthermore, carpooling or vanpooling will have to be presented to MEPs in the light of gaining convenience, which they fear to lose, and freedom from the hassles of driving, which bother them more than others. Their status concerns need to be met. Highly personalized matches may do this in carpooling. For vanpools, comfort and good appearance and the example of colleagues may be prime. For example, it may be well worth a ridesharing program's efforts to "handtailor" an excellent vanpool for a small group of well-regarded MEPs before trying to broaden the vanpool program at a given company, activity center or neighborhood.

White Collar Personnel

A Note About The Sample

Defined as white collar for the purposes of this study were all those employees whose work involves primarily clerical skills, no manual labor, and no supervision of other employees. The exception to the last criterion includes those working supervisors, such as administrative secretaries and certain chief keypunch, mailroom, or sales clerk personnel, who devote substantial portions of their day to the same duties as those they also manage. This is the least diverse occupation group of the study.

White Collar Ridesharing Experience and Interest

White collar personnel occupy a middle position between blue collar and MEP workers on past ridesharing experience and past exposure to ridesharing campaigns. They run consistently 13 percent to 15 percent lower than the MEPs on these measures. They are close to blue collar employees in both kinds of ridesharing experience (only about 2 percent higher), but they have been exposed to significantly more ridesharing campaigns, by about 10 percent. (As mentioned before, there are no differences in rate of response to campaigns according to occupation.)

White collar employees prove to be the most interested in ridesharing. Their responses to the forced choice question about mode preferences are like the total sample's in putting carpooling first. However, they are unlike the other two occupation groups in: (1) showing the most interest of the three in carpooling, (2) the most interest of the three in vanpooling, and (3) in rating buses and subways together as much lower preferences. This group greatly prefers private over public transportation. When asked to rate their interest in each ridesharing mode now in nonforced choice items, they express the most interest in both vanpooling (42 percent) and carpooling (49 percent).

None of these interest and experience findings appears determined by sex, despite the fact that only one-third of the white collar employees were men, vs. two-thirds in the MEP and blue collar groups. Either no significant differences by sex emerged, or they did so on items where the responses of the predominantly male blue, and predominantly female white, collar workers were nearly alike.

What Favors White Collar Ridesharing

These employees are worried indeed about commuting

costs, as well as certain solo driver hassles. Although their household income levels are some \$10,000 greater per year, on the average, than blue collar workers, their concern about gas price increases is about the same and greater than the MEPs. White collar personnel pay more for parking—and therefore commuting—than blue collar personnel, but less than MEPs. Their interest in ridesharing in order to obtain free parking is less than the first, but greater than the second, in tune with both their income levels and parking costs. On many other cost measures, white collar employees are at the same rather high levels as the total sample. As with that total sample, their interest in the bargain drops when they consider certain drawbacks to ridesharing.

They are more worried than any other group about being late to work, driving alone as they do now. Like others, they too find that risk greater if you vanpool or carpool. They see making the arrangements to carpool (but not vanpool) as far less of a hassle than others.

Status concerns are somewhat less of a problem for these employees in the sense that somewhat fewer of them think that people who rideshare are not well off, and they would be little embarrassed to excuse themselves in front of others to meet a pool. Along with the MEPs, they are slightly less likely than blue collar employees to feel better driving than being driven by someone else (although the level remains high), and only moderately concerned to drive alone in order to be able to relax by themselves.

Like everyone else, white collar workers would endorse ridesharing if to secure guaranteed parking at work, and they are more responsive than anyone else to ridesharing to gain highly preferential parking (very close to the work entrance).

Ridesharing Barriers For White Collar Employees

These employees like to drive their own cars to work. They find it a more relaxing ride than others do, they look forward to the pleasure of driving their own cars at the end of their workday, and they are more bothered than average at the thought of not having their car immediately available to them during the workday should they need it. Evidently their mastery needs are satisfied by the solo commute far more than MEPs. They distinctly like the idea of a chauffeured vanpool when it is presented in that light. They also distinctly dislike vanpools when these are described as too much like taking the bus—"the driver runs the show" and you have to keep to their schedule, not yours. Convenience is an issue. They worry about not having enough room in a carpool or vanpool for packages or briefcases, and loss of errand running flexibility when you rideshare downgraded their cost concerns considerably. Their concern with convenience is not as sharp as the MEPs, but it is there. However, it is evidently something of an image, or prospective, one. They run no more errands than anyone else despite the concern for package space, and they are a little below average in endorsing the mode split that would make their cars available before they arrive home in order to gain flexibility.

What White Collar Workers Require

What they require largely repeats the overall findings. They want active outreach programs that would help match them with others that they can know something about first,

particularly in a carpool. A little more than others, they endorse vanpools, whether these are organized in the neighborhood or at the work site. They are the least likely to start a carpool by themselves, and at the very low study average for starting a vanpool themselves.

White collar workers are excellent, and somewhat overlooked candidates for both types of ridesharing, were they given active and personalized help with it. The private transportation aspects of ridesharing should be emphasized because these appeal so much to them. Their mastery concerns can be taken care of through thorough familiarization meetings and personalization. Emphasis on the cost savings and rules about promptness for pool members will help allay their convenience concerns. The latter may also be modified if it is possible to provide vehicles for some noontime errands (vanpooling to a shopping center perhaps) or for emergencies.

Blue Collar Employees

Note About the Sample

The blue collar sample was defined as characterizing jobs which primarily require working with one's hands. Supervisors were excluded except for those working supervisors who spend substantial amounts of time doing the same tasks as those over whom they have some authority. No unskilled workers were interviewed because of practical problems (location at field sites which are unpredictable well ahead of time, and employer reluctance to release the time of seasonal workers, or to trigger union complaints of uneven treatment). Fewer semiskilled than skilled workers were found for similar reasons. The range of blue collar personnel, included, however, is wide and drawn from industry, commerce, and the service. Examples include waiters and waitresses, plant operations personnel, office maintenance people, highway repair crews, and nursing assistants.

Blue Collar Ridesharing Experience and Interest

Blue collar employees have the least carpool experience of the three groups. (There is no occupational distinction in vanpooling experience, probably because no group has had much: a floor effect.) They have also been the least reached by either carpooling or vanpooling campaigns, in fact about 25 percent less than MEPs.

This occupation group is the most ambivalent about ridesharing, and that ambivalence appears to be sharp.

When forced to a single choice among nonsolo driving modes, this group's preference order is like the total sample's: carpools, vanpools, buses, subways. They are like white collar workers in rating carpooling very high (60 percent preference) and subways very low. They are like MEPs in rating vanpools close to buses and considerably behind carpooling. However, when their choice is not forced, their interest in carpooling is only 43 percent (resembling MEP interest levels), and in vanpooling now 37 percent (greater than MEPs, less than white collar workers.) They would prefer 4-person carpools (same median as other groups), but show a distinct edge for even 5-person ones. On the other hand, they also perceive the vehicle as crowded in a carpool, and are less likely than the other two groups to predict they would carpool in either a standard or an intermediate size

car. (Like the total sample, few would be interested in the mode if compacts or subcompacts were involved.)

What Favors Blue Collar Ridesharing

Cost concerns, parking concerns, flexibility about convenience issues, and no problems concerning depending on others per se (depending on how reliable those others may be, which they question) are four issues favorable to ridesharing on which there appears little blue collar ambivalence.

Cost. This was the lowest income group of the study with household incomes in the \$10,000 to \$20,000 a year range. They also pay the least for parking, and therefore for their regular commute bills, but they drive the oldest cars in the poorest condition and probably devote more money (and time) to repairs. They are outstanding for favoring vanpooling because one avoids so many repairs, and like the white collar employees are extremely reactive to the hypothetical gas hikes suggested in the survey. They would also be the most likely to rideshare (70 percent) in order to obtain free parking. However, like everyone else, blue collar workers become markedly less interested in the cost benefits of ridesharing when they consider these in the light of restrictions on errand running or particularly having to wait sometimes for late carpool members.

Parking. In addition to favoring ridesharing more than other groups if it meant free parking, these employees were the most interested in ridesharing for guaranteed parking (68 percent), and like white collar workers rated ridesharing fairly high (57 percent) if one could obtain highly preferential parking that way.

Convenience. Blue collar personnel are the least worried about sufficient space in vanpool and carpools for carrying things (though half are concerned). They are the most interested in ridesharing to a park-and-ride lot in order to be able to run errands, meet friends, etc. at the end of the workday, an interest which is outstanding at the 65 percent level. It appears from the Panel data to be more related to socializing at the end of the day than to errand running and to mastery needs (see below).

What Makes Blue Collar Workers Ambivalent About Ridesharing

These commuters are surrounded by commuting difficulties. They are harassed about solo driving problems, but also at the thought of many ridesharing problems. They are highly interested in socializing during the commute, but extremely wary about the social situations they might find themselves in. They are somewhat more independent than the other two groups about arranging carpools and vanpools themselves (not highly independent), but also see these modes as difficult to arrange. They tend to confirm their status by their commute modes and can be swayed one way or the other by the way ridesharing is presented (e.g., "chauffeured vanpools" vs. "they run the show and the schedule").

Hassle. These workers, as noted, endorse vanpooling for avoiding the auto repairs they have to bother so much with, and are at the high study average for being willing to leave earlier in the morning to rideshare and thus avoid gas station trips. At the same time, they show the greatest desire (65 percent) to drive alone in order to be able to relax by themselves, and are at the high study averages on disliking the risk

of missing one's vanpool, finding both ridesharing modes difficult to arrange, and hating to have to wait for late carpool members. They share the medium level concern of the total sample that one may be late to work when ridesharing, particularly in a carpool.

Social issues bother these people, despite the fact that they are the most enthusiastic about ridesharing as a pleasant way to meet others when you have changed homes or jobs (89 percent). They are outstandingly cautious in wanting to meet others once even before vanpooling (67 percent), and equal to others in the same criterion for carpooling. Far more than the other two groups, a solid minority of blue collar workers would carpool ONLY if well acquainted with everyone else (35 percent) or vanpool (31 percent). They are at the high study average in preferring pool members to be from their own neighborhoods. (Nevertheless when the matter is put another way, they are a little more reluctant than MEPs and white collar workers to endorse neighborhood organized carpools, perhaps trusting the reliability of a worksite coordinator more.)

Status. More blue collar workers than others like the idea of the chauffeured van (62 percent), and fewer would find it embarrassing to excuse themselves in front of the people with whom they work to meet a pool (15 percent). Nevertheless, they are like the total sample in that a majority agree they dislike vanpools for being like the bus because the driver controls the situation and the schedule is present. (Like everyone else, they think both that people who are financially well off tend not to rideshare and that doing so would not lower their own lifestyle.)

Barriers to Blue Collar Ridesharing

Mastery is the main issue. Blue collar employees are the highest on wanting their own cars available at the end of the day in order to enjoy driving them, the highest (as previously noted) on needing this solo commute to relax by themselves, the highest on feeling better driving than being driven. They are at the high study average in endorsing carpooling over vanpooling because you have more to say about all the details of the arrangements (smoking, eating, waiting for late members and how long). They are also at the high study average in feeling bothered if they did not have their cars at work so they could be immediately available if necessary.

Furthermore, they have *safety* concerns others do not share to anywhere near the same degree. More than one-third would not feel safe waiting on the street to meet a carpool (perhaps related to the location of their worksites), and over two-fifths would not feel safe from accidents with someone else at the wheel.

What Blue Collar Workers Require

What blue collar workers require, first of all, is more of the attention of vanpool and carpool programs. These employees are highly motivated by their more difficult financial circumstances to save commuting money, but they have been rather little approached. Furthermore, they are putting up with considerable aggravation in trying to maintain cars to drive alone to work and would like that pressure eased if vanpooling and carpooling could be made clearly reliable and safe. They are exactly like the other two groups in needing

active outreach programs. They are socially more diffident, as the Panels indicated clearly, and need assistance in making it legitimate to set rules and abide by them. Comradeship among colleagues is important; they know many will not be good poolmates, yet they do not want to pay the social price for confronting problems. (They also run the risk of losing an hour's pay for lateness that other groups do not face.) Finally, their mastery needs must be met. They are the best candidates for park-and-ride pools. They would be responsive to familiarization sessions in which the group takes the responsibility for setting carpooling and vanpooling rules. They would do very well in employer vanpool programs to solve reliability problems about late members.

DIFFERENCES BY SEX AND BY COMMUTE PATTERN

Rather few differences were found between men and women, and fewer between those suburbanites who drive alone to urban, vs. to suburban, worksites. Since the findings are few, there are certain distinctions, discussed in the following, which suggest some modification of ridesharing strategies when the groups analyzed here can be targeted specifically within programs. It is notable, for example, that men have been exposed more than women to both vanpool and carpool campaigns in the past, despite the fact that women are no less interested in ridesharing. The discrepancy is not as great as by occupation group, but it is sizable.

Men and Women

Note On The Sample

The research design for this study stratified occupation according to a pattern roughly paralleling the employment of men and women in the U.S. As a result, 25 percent of the women interviewed were blue collar employees, 50 percent white collar, and 25 percent MEP (managerial/executive/professional). The distribution for men was 40 percent blue collar, 20 percent white collar, and 40 percent MEP. (These figures were designed to achieve a stratification which estimates, rather than perfectly mirrors, sex patterns in employment. They are the result of selecting blue collar and MEP samples with one-third women and two-thirds men, and a white collar sample with the reverse proportions.)

Ridesharing Experience and Interest of Men and Women

Their interest is equal, but not their past experience either of carpooling or of enjoying the attention of ridesharing programs.

The men in this study had more past carpooling (but not vanpooling) experience than the women, 54 percent to 46 percent. Ten percent more men (i.e., 40 percent of the men) had been exposed to carpool campaigns in the past, and 7 percent more (28 percent) to vanpool campaigns. The findings cannot be explained on the basis that men are better ridesharing candidates: there are no significant differences between the sexes in how responsive those exposed were to campaigns, nor in expressed interest in carpooling and in vanpooling now. (Nor did the forced choice question about mode preferences, if one did not drive alone, elicit any differences by sex—for instance, showing any female preference for public transportation.)

It is true that the discrepancies by sex are not as extensive as those by occupation (where MEP ridesharing campaign exposure ran 14 percent ahead of white, and 25 percent to 26 percent ahead of blue collar employees.) Nevertheless, there is a similar pattern of less past experience and less campaign exposure in the face of no less interest. One can only conclude that ridesharing programs have not succeeded in reaching a sizable target population of female solo drivers.

The occupation and sex findings probably overlap somewhat because the two variables are confounded in the study as they are in reality. Ridesharing programs certainly need to find more effective approaches for actually reaching non-MEP occupation groups, as previously discussed, but occupation group membership does not tell the whole story. A similar program reevaluation is needed in order to reach women effectively, regardless of their type of employment.

Ridesharing Facilitators and Barriers

Women. The privileges that ridesharing can confer and the safety of it appeal to women. More women (60 percent) than men (55 percent) respond to the notion of a "chauffeured" van, and 52 percent (vs. 44 percent of the men) think ridesharing would be worth it to gain highly preferential parking (within 200 feet of the work entrance). Also, 13 percent more women (i.e., 43 percent) do not feel safe from assault when they drive alone to work, so that the group aspect of both carpooling and vanpooling should be reassuring. Finally a full fifth of the women (vs. 14 percent of the men) are afraid of being late to work when they drive alone. Like men, women perceive that vanpooling and especially carpooling leave you with an even greater risk. However, programs which emphasize and help make possible prompt reliable pools will find that particularly appealing to women.

There are specific barriers for women in ridesharing, however, that need program attention. The greatest is that 62 percent of the women (vs. 53 percent of the men) feel that it is important to drive alone to and from work in order to be able to relax by themselves. This is probably because the women tend to work at both ends of the commute, preparing meals and taking care of children once they are home. Their tension is underscored by their reactions on convenience issues. Women in this study reported no more weekday errand running before getting home in the evening than men. (Note that household errands were not specified in the questionnaire item.) Yet more of them are bothered at the thought of not having their own car immediately available to them during the day (63 percent vs. 56 percent), and find that having your car to be able to run errands is more important than the money you could save ridesharing (46 percent vs. 37 percent). There seems to be a worry factor operating here about what they might be called on to do. Having the car available at all times also often relates to dealing with medical or other emergencies of their children. The errand running concern is probably because so many women provide the backup if their husbands have to work late. As one woman put it in the Panels, "We do a lot of sharing of jobs in our marriage because we both work, but it's still up to me to break my workday for the kids and take care of seeing we have what we need in the house." Very often this extremely common arrangement is made because the husband's salary is greater. Even when it is not, the woman's role of manager

of home and children is a strong tradition indeed. Regardless of the social causes, this is a problem for ridesharing programs. Employed women with young children will not be ridesharing candidates unless backup vehicles can be made available to them. Other women may be responsive to ridesharing to and from a safe park-and-ride lot (which 53 percent of the total sample endorsed if they were going to rideshare, women no less than men). However, the lot must be seen to be as safe. Far more women than men would not feel safe, for instance, waiting on the street at the end of the day for a pool (43 percent vs. 19 percent). Being dropped at a lot where they did not feel secure would be no more appealing. Finally, women appear a little more than men to care about status in their commutes and to dislike the notion of ridesharing for that reason. Their more positive response to the "chauffeured" van has been mentioned. On the other hand, a few more women think that either vanpooling or carpooling would reduce their lifestyle. Ridesharing will have to be presented as statusful. An emphasis on preferential parking is one thing that might help very much.

Men. What appeals to men rather than women about ridesharing is mainly avoiding the hassle of going to gas stations so often: 69 percent of the men (vs. 59 percent of the women) endorse ridesharing for that and would be willing to leave earlier in the morning to gain the relief. Both men and women are concerned about costs, but even more men see the gas cost bargain of a vanpool, and more would prefer saving commute money by ridesharing to having their cars available for errand running. Although men, as well as women, would want personalized matching and active outreach programs to help them pool, they are a little more likely to send their names into a central computer to get a match or to start a carpool or a vanpool by themselves. (However, the male percentages remain low on these items.)

What bothers men more than women about ridesharing is being embarrassed to excuse themselves in front of colleagues to meet a pool (23 percent vs. 13 percent of women), and wanting to pool only with those at a similar job level (36 percent vs. 28 percent of women). However, this last may be a distinction without a difference since the Panels revealed that this concern is much greater than people will express in the less reassuring survey situation for fear of seeming undemocratic. Men may simply be bolder about expressing their opinion than women.

SUBURBAN SOLO DRIVERS COMMUTING TO URBAN, OR TO SUBURBAN, WORKSITES

Note On The Sample

The total sample of suburbanites was divided evenly into two groups according to commuting pattern: (1) those driving to urban worksites—defined as anywhere within the city limits of the main city of a metropolitan area; and (2) those driving to suburban employment locations—defined as anywhere within the metropolitan area outside of the limits of the main city.

Ridesharing Experience and Interest of the Urban and Suburban Employed

Interestingly, although there is no difference between these two groups in past carpool (or vanpool) experience, or

in past exposure to campaigns, commute pattern makes the only difference found in the study in carpool campaign responsiveness: 30 percent of the suburban employed who had been reached by a campaign had tried carpooling as a result, vs. only half as many of the urban employed, i.e. 15 percent.

Part of the difference in responsiveness appears due to the public transportation options and preferences of those going into cities. In the forced choice item asking people to rate their preferences for modes other than driving alone, the second choice of the suburban employed was 23 percent for vanpools and of the urban employed 23 percent for a bus. (Both groups favored carpools over all other modes, a 61 percent preference of the suburban workers and a 50 percent preference of the urban ones.) When simply asked to state separately how interested they were in vanpooling and in carpooling now, there was no significant difference between the groups. A little under half, 44 percent, indicated present interest in carpooling and 37 percent in vanpooling, now.

The greatest past responsiveness and the somewhat greater current interest of the suburban employed in ridesharing were borne out by the Panel data.

Ridesharing Facilitators and Barriers According to Commute Pattern

The Suburban Employed

Facilitators to their ridesharing include that they appear altogether more hassled about their commutes, more concerned with cost, and more open to the personal collaboration with others that ridesharing involves. The research did not reveal large distinctions on single items, but rather small significant differences that summate to trends.

As far as hassles are concerned, a few more of the suburban employed endorse HOV lanes and ridesharing, if one could thus gain the HOV advantage. (Two things appear to operate here: suburb-to-suburb rush-hour traffic now tends to be worse than that in and out of CBDs; yet, once off the main arteries that would carry the HOV lanes, the small roads are less congested than in the CBD. It is a better picture altogether.) Furthermore, suburbanites favor vanpooling a little more for its advantage of avoiding repairs to one's car, and are more willing to leave home earlier in the morning to rideshare and so avoid many trips for gas. (It is probably a greater hassle for people who work in suburbs to handle both repairs and tank-filling trips since facilities tend to be farther off their commuting routes. These facilities are more frequent on the older main arteries leading into CBD's and travelled by the urban employed.)

The greater cost sensitivity of those who work in suburbs is perhaps remarkable in light of the fact that they are paying considerably less to commute since most park free. (Within cities, solo drivers in this study averaged over \$19 a month for parking.) The trend does not appear in the major cost sensitivity items on which all agree, but in those that trade off disadvantages of carpooling (such as depending on others or not having the car for errands) for cost benefits. While the suburban employed, like the urban, "vote" for the cost savings less when considering these disadvantages, they are still more in favor of the savings than the urban employed. (The best explanation appears to be that the suburban employed show a concern triggered by prospective costs. In contrast,

the urban employed solo drivers are less sensitive, precisely because they have become gradually adjusted to their higher commuting bills.) Finally, although there is no difference by commute pattern in the high preference for personalized ridesharing and active outreach programs, the suburban employed are considerably more open to being called by another (perhaps unknown) person forming a carpool: 67 percent are, vs. 58 percent of the urban employed.

Mastery is the one area where suburban employment appears to involve a specific barrier to ridesharing. Although all the solo drivers in the study endorsed carpooling over vanpooling because you have more to say about the entire situation, this was true of 69 percent of the suburban employed vs. 61 percent of the urban. People who live and work in suburbs appear to have been even more strongly conditioned to the personal control over the commute that solo driving affords.

The Urban Employed

The facilitators particular to these people are mainly demographic. They commute farther than their counterparts who do not go into town to work, and this amounts to longer than half an hour in the morning. They perceive options to solo driving far more (68 percent do vs. 40 percent of the suburban employed), perhaps because of the public transportation available in town. Within the cities examined in this study, parking availability was very good (87 percent find it easily available at or near work), but not as extremely good as in the suburbs (98 percent easy availability). Moreover, as mentioned above, commuting is costing these solo drivers considerably more in parking fees. It is also costing them more in gas because they commute an average of 6 more miles a day, or a little over 120 more miles a month. They are the high study averages in being disturbed by the various hassles and costs of their commutes, but as previously discussed, cost motivates them less than the suburban employed to consider ridesharing.

The main barrier to ridesharing for this group appears to be less trust of others and less interest in joining forces to commute with people they do not know. It is not that they want personalized matches more than the suburban employed—everyone wants that—but that they will tolerate less being contacted by unknown other poolers or using a lobby locator list.

All in all, it would seem that in addition to the strategies that might appeal to any solo driver, the suburban employed will respond particularly to freedom from "feeding and maintaining" their cars so much, to cost benefits, and to ridesharing opportunities that offer them the greatest possible say about the arrangements and "rules of the road." The urban employed are a little more adjusted to complying with the travel situation presented (as in public transportation), but they demand considerable control over with whom they will share rides, that is, they will need highly personalized programs to circumvent their distrust. Their wariness is due to perceiving as highly heterogeneous the cities into which they otherwise might find themselves riding in close company with socially incompatible people.

It should be noted that this wariness may come to characterize solo drivers who work in the suburbs as well, as today's process of gentrification of cities and migration of lower socioeconomic groups to suburbs continues.

APPENDIX E

CASE HISTORIES OF THIRD-PARTY VANPOOL AND BUSPOOL SERVICES

VANPOOLS

The three types of third-party vanpool services differ principally in the ownership and financing of the vans:

1. One like Knoxville's service, which assists the formation, private financing, and operation of owner-operated vanpools.

2. One like Golden Gate's service, which provides an RSA van to start the pool, then requires drivers to transition into a nonproject-owned vehicle after 6 months.

3. One like RIDES' service in San Francisco, where the vans are financed under an RSA-sponsored master lease agreement and leased to individual riders.

This appendix describes how the three prototype vanpool programs—Knoxville, Golden Gate, and RIDES—operated in October 1979. Two of the programs, those of Knoxville and Golden Gate, also include buspools, and those operations are described along with RIDES plans for providing matching services to chartered buspools. These programs were chosen because they have notable histories of successful areawide or corridor vanpool operations and they illustrate a diversity of approaches.

Table E-1 summarizes the main features of these three programs, and Table E-2 compares the current vanpool fares charged (buspool fares are comparable). The fares for Knoxville are about \$6/month lower than RIDES for 12 riders and Golden Gate fares are considerably lower—but the Golden Gate's prices are based on older and smaller vans. The lower costs for Knoxville are mainly due to economies of owner-operated vans (lower insurance and financing charges and no leasing company fees); but they also reflect lower van license fees in Tennessee. The fares of VANGO in Maryland, Masspool in Boston, and Commuter Pool in Seattle are somewhat higher than Knoxville's.

The text that follows describes each program separately, omitting its history. Their histories are well documented in the Refs. (38, 82, 83, 35, 58) which together with personal inquiries were the sources of data reported on in this section.

Knoxville Commuter Pool

The Knoxville areawide ridesharing agency, called the Knoxville Commuter Pool (KCP), is located at the University of Tennessee Transportation Center and funded by the Tennessee Energy Authority via UMTA. Its vanpool/buspool program is run by a full-time vanpool program coordinator who also makes use of the KCP commuter matching services for matching prospective vanpoolers and buspoolers. There were 97 vanpools and 10 buspools as of Oc-

tober 1980, making Knoxville's program one of the largest third-party vanpool operations in the country, even though it serves primarily a metropolitan area of only 180,000 persons with a work force of about 100,000.

The program operates through KCP and a nonprofit affiliation of private operators called the Knoxville Area Vanpool Association (KAVA). KCP has arranged for 100 percent financing of the driver-owned vans and buses through private lending institutions, and guaranteed 90 percent of any capital losses by the pool operator or the lending institution during the first year, up to \$1,000 per vehicle. The guarantee is implemented by "abort agreements" between KCP, the vanpool operator, and the lending institution that specify these requirements for loan applicants:

- Residence in the 12-county area served (the eastern third of Tennessee).
- Purchase of a van with seats for eight or more for use in work trips.
- Membership in KAVA and loan eligibility.

The KAVA membership agreement specifies a number of responsibilities for the pool operator. These principally include obtaining vehicle insurance, training a backup driver, proper vehicle maintenance and operation, display of KAVA decals in the window, and submission of a brief quarterly report to KCP providing information on the route and schedule, areas served, fares charged, and passengers carried. The major KCP responsibilities under the KAVA agreement are to provide:

- Computer match lists of potential riders.
- Advice on determining computer van and bus specifications, insurance sources, operating costs, passenger fares, and financial records.
- Help in arranging group van purchases at reduced cost and vehicle financing.
- A replacement van, at daily rates, when the operator's vehicle is not available.
- A KAVA membership car entitling discounts on parts, service, repairs, and towing at participating merchants.
- The National Safety Council's defensive driving course for operators and back-up drivers (offered periodically).

The KCP/KAVA buspools are outgrowths of former vanpools in which the owner-operators had a backlog of requests for seats on their vans and decided to expand through buying buses rather than second vans. Once organized, the remaining seats have filled rapidly. Both buses are 40-passenger size.

Table E-1. Selected information about three third-party vanpool programs.

ITEM	KNOXVILLE	GOLDEN GATE	RIDES, INC.
Sponsor	Tenn. Energy Authority through the Knoxville Commuter Pool, managed by the Univ. of Tennessee Transportation Center	Golden Gate Bridge, Highway and Transportation District	RIDES for Bay Area Commuters, Inc. (non-profit organization)
Starting date	June 1977 (KCP vans first offered for sale to drivers)	October 1977	March 1978
Number of vanpools as of 10/80	97	131 (includes 27 RIDES vans)	242
Number of buspools, same date	10	21	0
Target group	Eastern Tennessee commuters, principally in the Knoxville metropolitan area	Marin and Sonoma county commuters into San Francisco and within the counties along the Route 101 corridor	San Francisco Bay Area commuters
Van procurement	Purchased by drivers; 100% financing and 90% guarantee against capital losses are available	Purchased by District with federal grant	Leased under master agreement with Van American Network, Inc. directly to drivers
Van size	Driver's option; most are 12-seat, with increasing number of 15-seaters	12-seat "deluxe" and 10-seat "luxury"	Mostly 15-seat; about 25 10-to-12 seat
Insurance	Purchased by vehicle owners	Carried by grantee on project vans and by drivers (or lessor on leased vans) after transition	
Maintenance	Arranged and paid for by vehicle owners	Performed at designated dealerships and service stations and billed to	Arranged by driver and billed to Van American
Pool Group Size	Minimum size is 7 riders and the driver, but break-even fares usually set no lower than 8 or 10 riders for 12 or 15-seat vans	Minimum size is 9 riders for 10-seat vans and 10 for 12-seat vans. Vanpools can be started with 5 riders	Minimum size to start is 9 riders for the 15-seat vans, but the pool usually seeks more riders to reduce its individual rates
Driver incentives	Free commute; full use of vans, and their eventual ownership	Free commute; mileage fee for personal use of van over 100 miles and up to 500 miles per month	Free commute; mileage fee for personal use of van up to 500 miles/month; 100 miles free if van is washed twice monthly
Average round-trip distance	77 miles	73 miles	74 miles
Professional vanpool staff	1.5	4	5

Reference	Coverage		
	Knoxville	Golden Gate	RIDES
82			X
83	X		
84		X	
35	X	X	
58	X		X

Table E-2. Fares for selected third-party vanpool programs (estimated 1981).

Round Trip Miles	Knoxville		Golden Gate		RIDES	
	12 Riders	10 Riders	11 Riders in 12-seat van	9 Riders in 10-seat van	14 Riders	12 Riders
25	\$40.00	\$48.00	\$25	\$37	\$39.00	\$45.00
35	43.00	52.00	27	40	41.00	48.00
45	47.00	56.00	29	44	44.00	51.00
55	50.00	60.00	31	48	48.00	56.00
65	53.00	64.00	34	53	50.00	59.00
75	57.00	68.00	37	58	53.00	62.00
85	60.00	72.00	40	63	56.00	66.00
95	63.00	76.00	44	68	59.00	69.00

KCP, Golden Gate and RIDES programs with gasoline prices estimated at \$1.40/gallon and interest rates at 14% for KCP and 16% for RIDES

They operate like vanpools, picking up passengers at a few points in the morning and returning them in the afternoon. Bus fares are comparable to those of vanpools—for example, one bus runs a 60-mile round trip for a \$10 weekly fare, equivalent to \$42 monthly.

KCP/KAVA suggests a policy of setting rider fares at a breakeven level of 8 riders for 12-passenger vans and 10 riders for 15-passenger vans, to allow for temporary loss of passengers and absences such as vacations. However, pool owners are free to set their own fares and some use a higher breakeven level, such as 9 for 12-passenger vans and 12 for 15-passenger vans (allowing for two empty seats on the average). A simple monthly fare calculation formula is suggested that combines vehicle operating and ownership costs, as in the following estimate for 1981:

- Variable cost 19¢/mile (gas 14¢, or up to \$1.40 per gallon @ 10 mpg; maintenance, 3¢; tires, 1.5¢ cents; oil, 0.5¢) × round trip distance × 21 days/month.
- Plus fixed cost of van payments (e.g., \$328/month for 4-year 100 percent financing at 14 percent interest), insurance (e.g., \$400/year) and license fees (e.g., \$20/year).
- Divided by the break-even number of riders.

This formula and the illustrated values were used in calculating the Knoxville fares shown earlier in Table E-2 for break-even points of 10 and 12 riders. KCP notes that operator attempts to raise fares in 1979 as gas prices increased met with varying degrees of resistance, and at least one driver rescinded a proposed increase when his riders threatened to go back to their autos.

KCP vanpooling promotion strategies are combined with a general ridesharing brokerage program, focused on Knoxville's CBD, major employers in the area, and smaller but clustered employers. The brokerage program includes carpool, vanpool, and buspool matching services; transit information; and promotion of express bus service and free downtown transit, known as Knoxville Downtown Short Hop (KASH). Social service transit facilitation and coordination were formerly included (as long as sufficient funds were available). Promotional materials and strategies include introductory brochures, posters, radio and TV ads and pub-

lic service announcements, and contacts with van dealerships, merchants offering KAVA discounts, and lending institutions.

The most productive promotion effort is direct employer contacts and the resulting employee surveys, which produce both carpool and vanpool applications. KCP emphasizes both the preparatory and follow-up steps of employer contacts: providing posters and employee newsletter material in advance of the survey, reports to the employer afterwards on results, and check on actions that the employer can take to facilitate ridesharing (such as arranging for preferential parking and appointment of a ridesharing coordinator).

The program has many advantages.

- It offers numerous options to commuters and employers, thus demonstrating their public service character and avoiding the role of advocate of a given mode.
- It provides support and guidance to vanpool operators and commuters.
- It has achieved high visibility and acceptance.

Golden Gate

The vanpool program at the Golden Gate Bridge, Highway and Transportation District is directed at 140,000 commuters in the Golden Gate corridor north of San Francisco, of whom 35,000 use the Golden Gate Bridge daily to reach the San Francisco Peninsula. The district bought 35 vans (12- and 10-seat) under an UMTA demonstration grant, and has since bought others with revenues from the leased vans. In October 1980, 39 Golden Gate vans were leased to vanpoolers. The vanpool staff at Golden Gate had four fulltime professionals in October 1979.

District policy permits initiation of a new vanpool with as few as five members, subsidizing operating costs for up to 2 months until a complement of at least 9 riders for 10-seat vans for 10 riders for 12-seat vans is reached.

After a period of 6 months, pools are invited to transition to their own vehicles, either purchased or leased by the driver. Information is provided on vehicle specifications, 100 percent loans, and insurance sources for purchased vehicles. Efforts are currently under way to obtain fleet discounts and more favorable insurance rates. RIDES, Inc. will also lease vans to these groups, and other van leasors are available.

As of October 1980, 55 pools had gone through the transition process. Of these, the drivers of 25 purchased their own vehicles, 19 leased RIDES third-party vans, and 11 utilized employer-sponsored vans. In addition to these transition arrangements, the district has assisted in the formation of 37 vanpools that did not utilize Golden Gate vans; 15 of these are owner-operated, 8 are with RIDES, and the balance is employer-owned. These are significant statistics because they indicate an almost even preference between owner-operated and RIDES vans, in a situation where the driver has a free choice and presumably has enough experience and data to make an informed decision. Because 100 percent financing has only recently become available and there is as yet no van-abort guarantee program in Knoxville, most of the Golden Gate owner-operated vans are not quite as advantageous or low in risk to the driver as are the Knoxville vans.

Promotion of Golden Gate vanpools included a variety of strategies for which records of cost and resulting vanpool applications were kept. From Table E-3, the standout strate-

gies both in low cost per application and the number of applications received were toll booth handouts, bus handouts, employer contacts, and plaza demonstrations. These four accounted for 94 percent of the applications through March 1978. Other approaches were 6 to 42 times as costly per application received. The contrast between the relatively low cost per application of employer contacts and the high cost of community meetings (at least in the way these were held) is especially striking, and supports the premise that cooperative employers are among the best program outreach organizations. The employer contact strategy was only getting started at the time these data were available. It should be noted that the contents of the handouts, the development of strategies, and the content for work with employers must derive from local population study and relevant planning. (See Chapters Four and Six.) There are, however, even more potent agents. A complementary survey of Golden Gate vanpoolers indicated that the following sources influenced them the most in choosing to vanpool:

SOURCE	% RECEIVING INFORMATION (A)	% THOUGHT MOST INFLUENTIAL (B)	VALIDITY INFLUENCE RATIO (B/A)
Friend or relative	58	36	0.62
Employer promotion	31	19	0.61
Toll booth brochure	30	10	0.33

Other sources had influence ratios of less than 0.33—residential promotion was 0.27; newspaper articles were 0.23; Golden Gate vans were 0.19; and newspaper advertisements were 0.14. These data again emphasize the important role played by personalized approaches, and the fact that cost is not the most important criterion.

Golden Gate Transit Authority handles the district's club bus program, which is contracted to six companies operating a total of 21 buses. Half of the total costs are met by a district subsidy. The operating companies have won competitive bids to run the club buses, and typically hire a driver who can keep the bus at his place of employment while working. Bus sizes range from 30 to 49 passengers. Club bus fares are comparable to vanpool fares, but the individual nature of the bidding procedures for different club bus routes results in some bargain fares that are not in line with fares for other routes. The Transit Authority is working on a revision of its bidding and subsidy procedures to a cost per mile basis that is intended to resolve this.

Data show the following percent of applicants that became vanpoolers through September 1979, confirming the relatively higher influence of personal referrals and employer promotion:

SOURCE	PERCENT OF APPLICATIONS RESULTING IN VANPOOLS
Vanpooler referrals	63
Employer promotion	35
Toll booth brochures	3

Table E-3. Cost and results of Golden Gate marketing strategies (through March 1978).

Strategies	Cost	Applications	Cumulative % of Applications	Cost per Application
Toll booth handouts	\$6085	560	57%	\$11
Bus handout	601	46	62	13
Employer contacts	3898	2331	86	17
Plaza Demonstrations (in office centers at lunchtime)	1455	84	94	17
Shopping center demos	300	3	94	100
Take-one holders (public flyers)	211	1	94	211
Newspaper advertising	8612	44	99	215
Petaluma free ride	608	2	99	304
Community meetings	7095	10	100	710
Other marketing expenses	6693	*		*
	\$35,558	981		36

* Not available
Source: Ref. (84), Table 4-6

The previous mode utilized by Golden Gate vanpoolers is also of interest. Again through September 1979, for 339 total vanpoolers, these were as follows: solo auto, 24.5 percent; carpool, 27.4 percent; transit, 27.4 percent; club bus, 3.5 percent; and other, 17.2 percent. The District considers it advantageous to move carpoolers to vanpoolers because of the higher occupancy rates, and also desirable to move transit riders to vanpools because the vans are not subsidized (beyond administrative costs).

RIDES Program

RIDES for Bay Area Commuters is a publicly financed nonprofit corporation whose purpose is to promote ridesharing in the 10 counties that make up the San Francisco Bay Area. Its vanpool program emphasizes simplified procedures and minimal involvement of RIDES staff after the pool is organized. Vans are leased from Van American Network, Inc., under a master agreement that permits direct leases from Van American to drivers, with RIDES as cosigner. The van lease fee is determined at the time of purchase based on initial cost; financing and insurance costs; and estimated maintenance, operating, and repair costs. Vans are scheduled to be sold on the open market at the end of the 50-month lease period, with a residual value of 15 percent guaranteed by RIDES.

A total of 242 vanpools was in operation as of October 1980, marketed and managed by two full-time vanpool coordinators (supplemented by their outreach, clerical, and information staff that respond both to vanpool and carpool inquiries). The average round trip was 74 miles. (See Tables 11 and E-3 for costs and fares.) Average occupancy was 13.8 passengers per van.

Persons interested in riding in or driving for a pool can call an application in to RIDES and receive an information kit by

mail. Drivers must have a clean driving record for at least 3 years, hold a Class II license, be at least 25 years old, complete a defensive driver safety training course, and pass a Class II physical examination. Qualified drivers receive a match list of conveniently located persons who have expressed interest. When the driver has located 9 or more prospects, a RIDES facilitator holds an orientation group meeting. This can be at work sites or in the evening at the driver's home where time pressures are often less severe. Schedules and any special agreements, such as smoking rules, are established by pool members.

A vanpool can begin with only 9 paying riders, but most vans soon grow to 12 or 14 riders as the existing riders seek new members to reduce their monthly fees. Average occupancy was 12.4 riders in 1978 plus the driver. Most RIDES vans are 15-seat models because smaller vans are most costly per seat and, hence, usually take more time to place in service. They are also more price-sensitive to loss of riders. The first rider lost in a full 10-seat van entails an 11.1 percent price increase, compared with only a 7.1 percent in a full 15-seater, for totals of 23.6 percent vs. 14.8 percent for the loss of two riders. Accordingly, smaller vans with low ridership are much more demanding of RIDES staff time in seeking replacements.

Drivers ride free and pay a mileage fee for personal use of the van up to 500 miles per month. An additional 100 miles per month of personal use is permitted free if the van is washed twice monthly. Drivers submit a monthly report to Van American, which provides RIDES with a computer summary of the individual reports.

About 63 percent of initial inquiries for RIDES vanpools came from leaving their new vans parked at the toll plaza off the San Francisco-Oakland Bay Bridge, highly visible to commuters, with decals showing the RIDES telephone number. Many subsequent inquiries have also come from persons who see the vans in use on the highway, and from highway and toll plaza signs giving the RIDES number. No general media campaign has yet been mounted, although several public service announcements have been prepared and are used periodically by television and radio stations. The principal promotion emphasis at present is on contacting employers with over 500 employees to seek their cooperation in surveying employee interest in vanpooling and carpooling. The vans are also demonstrated at employer presentations. RIDES vans often appear attractive to an employer because they allow the employer to avoid capital investment, liability insurance, and administrative staff time for vanpools.

Similar programs are operated by Massachusetts and Maryland, although Maryland's VANGO Program will also facilitate employer-sponsored, but owner-operated vans through an abort program that underwrites 75 percent of first-year losses up to \$1,200 (utilizing federal urban system funding for the purpose). The fares for such vans, exemplified by some at the Army's Aberdeen Proving Grounds, are close to those cited for Knoxville in Table E-2. VANGO is also studying both expansion of its owner-operated van promotion and elimination of the requirement in future master leasing agreement for putting \$400 per van in a contingency account to guarantee payments if vanpools default or disband.

RIDES is planning to provide matching services and assistance in organizing club buses through a "bus coordinator."

The drivers would be hired by one of the commercial charter operators in San Francisco, for which the commuting time would be off-peak service; and RIDES would lease bus and driver for the commuting runs. This arrangement is pending approval of a request by RIDES to the state Public Utilities Commission for exemption of the club buses from PUC regulation on the grounds that they will constitute a ridesharing service similar to vanpools.

BUSPOOL OR SUBSCRIPTION BUS SERVICE

The common characteristics of buspools are described briefly in Section 1.2 of this manual. This appendix describes identifying buspool target groups, organization and management, service and cost, and PUC certification aspects of successful buspools. It cites several examples of operating pools and includes a case study of the Reston Commuter Bus.

Identifying Buspool Opportunities

Buspooling has several economic advantages over carpooling and vanpooling. However, in practice the cost per mile for buspool service is generally higher than that of corresponding vanpool service.

The accepted energy efficiency potential of buspooling is about 200 passenger-miles per gallon with full seats and no deadheading compared with the potential of 150 passenger-miles per gallon for vanpools and about 100 for a 5-person carpool. This suggests that buspools could perhaps be operated less expensively than carpools. The same appears true of capital costs. A new 45-passenger bus with a life of 20 years costs on the order of \$100,000 (used buses at \$15,000 to \$20,000 and new school buses at \$25,000 to \$30,000 offer other cost alternatives). To transport the same number of people for the same period would require three vans each, plus three replacements at 5-year intervals. At an average cost of \$15,000 (allowing for some inflation on the replacements), this would mean \$180,000 in vanpool capital costs.

In practice, however, buspool fares for a 75-mile round trip typically range from about 3.5¢ per passenger mile (under the most favorable assumptions of driver-operated buspools with no backhaul) to 4¢ or more with a paid driver, whereas a typical third-party vanpool ranges from 3.3¢ to 3.8¢ (based on RIDES vans with 12 to 14 riders). Energy efficiency potentials and capital costs are not the only elements.

Buspools tend to have a higher vacancy rate. They often pick up passengers in several mileage zones to achieve a full load, resulting in empty seats for part of the trip, whereas vanpools and carpools typically serve a single area. Buspool driver compensation is also usually greater, presumably due to the driving skill requirements. In addition, there is often a level-of-service difference that imposes higher costs for commuters to get to pick-up points for buspools. This is because carpools and vanpools generally provide walk-to-stop service for a higher percentage of riders, whereas more buspoolers drive or ride to transit to the pick-up points.

Adding the backhaul requirements of buspools operated by charter bus companies increases costs, although there may be offsetting revenues from other uses of the bus during the day. To make up for their cost disadvantages, some buspools buy used (or even very used) equipment, or require subsidy as described in the service and cost section below.

Where commuter concentrations are of sufficient density to allow walk-to-stop service—or convenient transit service—within a single mileage zone for a substantial percentage of riders, buspools may be more cost advantageous than vanpools, without subsidies, or carpools. Buspools can be useful when the waiting list of applicants grows so large that this clustering of riders is an improvement over many carpools and/or vanpools.

Vanpools are often more cost effective than buspools, particularly if the vanpools are getting free administration or some other cost breaks that the buspools are not. One case is Specialty Transit, discussed in the next subsection, which has lost business to vanpools going to its prime destination, the large McDonnell Douglass work site outside of St. Louis. The employer-sponsored vans are cost competitive and give a higher level of service with the smaller vehicle. A second case involves the buspools from Tacoma to Seattle. At the end of 1980, Seattle/King County Commuter Pool stopped their buspool service because a new contract with the charter companies would have raised the monthly fare to \$70—well above the \$55 fare that vanpools going the same 70-mile round trip charged. (The charter operator has subsequently taken over one of the buspools and dropped the fare to \$60 in an attempt to draw riders back from the vanpools.) A third example is the elimination of a marginal buspool route to Lawrence Livermore Labs in Livermore, California, in 1979 by substituting vanpool service. Eliminating the marginal route avoided an overall buspool fare increase because the remaining routes were operating efficiently at capacity.

Organization and Management

Buspools have been sponsored by a variety of groups, including private bus operators, community groups, employers, employees, and transit authorities. Table E-4 summarizes organizational data for 6 buspool programs throughout the country, including examples of each type of sponsor. All these programs were in operation well before the 1973-1974 gas shortage and the associated revival of interest in ridesharing.

Regardless of the organizer, good management sensitive to commuter needs is necessary to provide reliable, low-cost, convenient service that can compete with the private automobile. For example, the owner of Specialty Transit, listed first in Table E-4, achieves these objectives through the following actions (85, pp. 336-337):

- Free and plentiful parking is provided at boarding points through negotiations with local fire stations, jails, bowling alleys, etc. Sometimes, certain gas stations agree to provide free parking in return for gasoline or diesel purchase.
- Negotiations with plant management have resulted in privileged parking and free movement through restricted areas and traffic junctions on the plant property.
- The owner does meticulous preroute analysis through dry runs along the proposed route to check alignment, sight distance, speed, and delay potential. A new stop is generally introduced if more than 4 passengers request it, provided the route deviation is not more than one mile. On the average, 10 passengers board the buses per stop.
- Buses are kept in top mechanical condition by two highly skilled, full-time mechanics. Bus drivers are required to report any deficiency in the vehicles, however minor. The owner has found that reliability of service is of utmost importance to his riders.
- Level of service is always maintained. Buses do not wait for late passengers, and each bus is assigned a back-up driver.
- The costs are kept low by employing part-time drivers who are also workers at the plant. They are paid only for the actual driving time to and from the plant.

When the organizer is a community group, such as The East Bay-Peninsula Commute Club, management is provided by a volunteer officer or officers. A key concept here has been the use of “busmeisters” or buspool coordinators to make the service personal and responsive to riders needs. These persons ride the buses free and in return coordinate service, collect fares, sell ticket books, and collect feedback

Table E-4. Selected buspool organizations.*

ORGANIZERS CHARACTERISTICS	PRIVATE OPERATORS		COMMUNITY GROUP	EMPLOYER	EMPLOYEES	TRANSIT AUTHORITY
	SPECIALTY TRANSIT	COM-BUS	EB-P COMMUTE CLUB	TVA	UNITED AIRLINES	GOLDEN GATE BRIDGE DISTRICT
Location	St. Louis, Missouri	Los Angeles	San Francisco	Knoxville	San Francisco	San Francisco
Period of Operation	1959-present	1969-present	1967-present	1973-present	1965-present	1971-present
Number of Vehicles	13	30	1	89	15	26
Number of Subscribers	350-400	1100	70-80	3400	700	1100
Income of Subscribers	Medium	Medium-High	Medium-High	Medium-High	Medium-High	Medium-High
Lengths of Trips Served (miles)	21-50	20-70	20-50	5-70	25-60	20-60

*1980 data.
Source: Crain & Associates

on the service, either informally or through surveys. The term "club bus" is used to refer to this form of organization.

Service and Cost

Tables E-5 and E-6 describe the 1980 service levels and costs for the same buspool groups given in Table E-4. Although the cost data are incomplete, some general observations can be made about service and costs. Good access is important and most buspools serve employment sites directly, although often requiring some driving on the home end. Guaranteed seating is important. Most potential riders will not subscribe if they are not guaranteed a seat. Also, all but one of the services have average trip lengths of 20 miles or more one-way. This is because the pick-up time is a greater proportion of the trip time on short trips. There are also some capital costs, such as for buses, that are too high to be amortized over short trip distances.

The exception is the 12-mile average trip for office workers at TVA in downtown Knoxville. The effect of the short distance is shown by the office workers paying double (4¢ vs. 2¢) per mile the rate construction workers pay for a longer trip of 48 miles. An important advantage of some buspools (compared with vanpools) is their availability on a daily-fare

basis for occasional users rather than only through monthly subscriptions.

Three categories of cost/passenger trip mile (the last line in Table E-6) can be identified. The lowest includes United Airlines, the East Bay-Peninsula Commute Club (EB-PCC), and probably Specialty Transit. All cost 3.5¢ per passenger-mile or less. (The United Airlines cost of 1.3¢ is based on the lowest cost of two operators sampled, one with a total of 6 buses, and may not be accurate for the rest of the buses serving this employer. It is likely, however, that all costs are low in this operation because old buses are used and the drivers are generally part-time employees who also work at United Airlines. Expenses are further reduced by leaving the buses parked at the work site during the shift they serve. Some bus owners have a regular charter license and may hire the buses out during the work shift with another driver, thus further lowering the commuters cost by spreading the fixed cost.) The Knoxville Commuter Pool buspools, described earlier, are also driver-owned and operated on a parttime basis, at costs comparable to owner-operated vanpools.

The East Bay-Peninsula Commute Club meets some conditions cited earlier for economical operation of a buspool: rider management and limited pickups and stops to let passengers off. This includes many persons driving or biking

Table E-5. Service characteristics and fares for selected buspool organizations, 1980.

Organizers Characteristics	PRIVATE OPERATORS		COMMUNITY GROUP	EMPLOYER	EMPLOYEES	TRANSIT AUTHORITY
	Specialty Transit	COM-BUS	EB-P COMMUTE CLUB	TVA	United Airlines	Golden Gate Bridge District
Access Conditions						
at origin	Park-and-ride	Park-and-ride	Walk or park-and-ride	Walk or park-and-ride	Walk or park-and-ride	N.A.
at destination	to door	to door	to door, walk, bike, or shuttle-bus	N.A.	to door or parking lot	to door or short walk
Guaranteed Seating?	Usually	Yes	Usually	No	Yes or Usually	Yes
Air Conditioned Coaches?	No	Yes	Yes	Yes	Yes	Yes
Luxury Seating?	No	Yes	Yes	Yes	Yes	Yes
New Equipment?	No	Some	Occasionally	Some	No	Some
Professional Driver?	No	Yes	Yes	1/3	No	Yes
Approximate Fare in ¢ per Passenger/Trip Mile	3.6	4.5	3-4*	2 or 4**	2.4-3.5***	3.6
Income of Subscribers	Medium	Medium-High	Medium-High	Medium-High	Medium-High	Medium-High

*On commute basis; 5-6¢ on single ride basis

**The 2¢/passenger-mile fare is for 48-mile trips and the 4¢/passenger-mile fare is for 12-mile trips (one-way)

***The specified fares are based on a sample of two operators, one with 3 buses and one with 6.

Table E-6. Cost data for selected services, 1980.

ORGANIZERS CHARACTERISTICS	PRIVATE OPERATORS		COMMUNITY GROUP	EMPLOYER	EMPLOYEES	TRANSIT AUTHORITY
	SPECIALTY TRANSIT	COM-BUS	EB-P COMMUTE CLUB	TVA	UNITED AIRLINES	GOLDEN GATE BRIDGE DISTRICT
Supplier of Vehicle	Own	Own one, contract others from charter companies	Contract w/ charter company	Contract w/ charter or transit company for 1/3, own the rest	Own	Contract w/ charter company
Type of Equipment	Remodeled school buses	Deluxe coaches	Deluxe coaches	Deluxe remodeled school buses	Deluxe coaches	Deluxe coaches
Driver (part time of full time)	Part-time	Full-time	Full-time	1/3 full-time, rest part-time	Part-time	Full-time
Dead-heading Requirement	No	Yes	Yes	For downtown trip	Yes	Some
Average Route Length - R (miles)	35	40	60	12 or 48*	40	43
Cost/Bus Trip - C (\$)	N.A.	N.A.	72.50	N.A.	N.A.	89
Vehicle Seating Capacity - S	45	45	48	42	42	43
Cost/Productive Seat-Mile C/(RxS) (¢)	N.A.	N.A.	2.5	4	1***	6.0**
Load Factor - L (%)	75	85	95	82	75-90	N.A.
Average Trip Length - T (miles)	35	40	60	12 or 48*	40	43
Cost/Passenger Trip Mile C/(LxSxT) (¢)	N.A.	N.A.	2.7	4.9	1.3***	>6

*Routes for office workers average 12 miles one-way; for construction workers, 48 miles one-way

**The average seat-mile cost is higher than that given by the formula because charter costs vary nonlinearly with distance

***Costs are for one group of six buses; it is not known how representative they are of all United buses

Source: Crain & Associates

to the stop on the home end as well as some walking, biking, or riding a shuttle bus at the work end. It does pick up about 25 percent of its passengers at stops midway to two-thirds along the route, causing some empty seats for part of the trip, but higher fares are charged for those seats. The uncommon economies of Specialty Transit have already been described. The operator's 1980 costs were not yet known when these data were collected, but with a fare of 3.6¢ per passenger-mile (and given that Specialty Transit is a private operator who cannot stay in business without making money), costs are probably around 3.5¢ per passenger-mile or below.

The costs for TVA in Tennessee are somewhat higher at approximately 5¢ per passenger-mile. TVA has a mixture of buses, owning about 60 and chartering about 30. The Blue Bird coaches it owns are essentially converted school buses that cost half the price of regular coaches. Further economies are achieved by using the owned buses on long routes (average 48 miles one way) carrying construction workers to work and having a part-time driver who also works at the construction site. The shorter trips (average 12 miles one

way) for office workers use chartered buses which have full-time drivers and dead-head to pick up the workers. The overall load factor of 82 percent is also important in keeping costs down. Fares are subsidized down to about 4¢ per passenger-mile for officer workers and 2¢ per passenger-mile for construction workers. The costs for COM-BUS in Los Angeles are probably between 4¢ and 4.5¢ per passenger-mile because the average fare is 4.5¢ per passenger-mile, and COM-BUS must make money to continue providing the service.

The highest costs are those of the Golden Gate club buses in San Francisco, at over 6¢ per passenger-mile. It is not clear why the Golden Gate costs are so much higher than similar club buses, such as COM-BUS or East Bay-Peninsula Commute Club. One possibility is that the charter companies who provide the buses may use more new equipment and need to charge more for it. The commute runs are the "bread-and-butter" service for the charter companies, who may be charging enough to survive if their other business is slow. Yet, contracts are awarded by competitive bid. A 45

percent subsidy, plus free contract administration, has kept the Golden Gate club buses cost comparable with vanpools. Charges to clubs average 3.3¢ per seat-mile, and clubs generally add about 10 percent onto that for a fare, averaging 3.6¢ per passenger-mile. Most buses have waiting lists and stay full. Because of the high quality of service, the number of buses has increased from 11 in 1974 to 26 at present. The subsidy is acceptable to Golden Gate because it is lower than their conventional transit subsidy and helps reduce vehicular traffic over the crowded bridge during peak periods.

A new approach known as Bus Employment Express Program (BEEP) may help fill the gap in subscription bus service for commute trips under 20 miles one way. BEEP involves greater utilization of buses and drivers by making multiple trips to serve staggered work shifts at employment centers. In the simplest case, a bus will make several stops to collect passengers, travel under near express conditions to an employment center to unload, dead head to another series of pick-up stops, and return with a new load of commuters for

the next shift. Coordination with other buses and the presence of several shifts permit a service that can handle both short and long routes. Fares are set proportional to trip distance to avoid the fare problem described earlier. Fares are paid daily to encourage occasional riders. Although this concept is not limited to public transit sponsorship, in the only known example of it, the Southern California Rapid Transit District is conducting a 2-year federally financed demonstration in El Segundo, California. (See Refs. (86 and 87) for details.)

Preliminary reports from the project indicate that initially the service attracted only about 10 riders per bus trip until the fuel shortage in 1979. By August 1979, the average number of riders per trip had risen to about 28. One-way cash fares are 50¢ for 2 to 7 miles, 75¢ for 9 to 15 miles, and \$1.25 for 17 to 25 miles. A 6-month 23 ride ticket book is also provided. A survey of BEEP prior to the ridership increase indicated that 65 percent of the users were former solo drivers, 14 percent were former carpoolers, and 7 percent were former transit users.

APPENDIX F

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