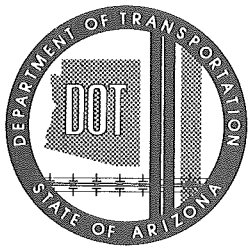


ARIZONA DEPARTMENT OF TRANSPORTATION

REPORT NUMBER: FHWA/AZ 85/198-II

AN EVALUATION OF ALTERNATIVE ECONOMIC INDUCEMENTS TO RIDESHARING FOR THE ARIZONA COMMUTER

Volume II: Research Methodology

Prepared by:
Dr. William C. Black
Department of Marketing

Dr. David A. Plane
Department of Geography and Regional Development

Dr. Robert A. Westbrook
Department of Marketing

University of Arizona
Tucson, Arizona

JUNE 1985

Prepared for:
Arizona Department of Transportation
206 South 17th Avenue
Phoenix, Arizona 85007
in cooperation with
U.S. Department of Transportation
Federal Highway Administration

The contents of this report reflect the views of the authors who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Arizona Department of Transportation or the Federal Highway Administration. This report does not constitute a standard, specification, or regulation. Trade or manufacturer's names which may appear herein are cited only because they are considered essential to the objectives of the report. The U. S. Government and the State of Arizona do not endorse products or manufacturers.

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
FHWA/AZ-85/198-II		

4. Title and Subtitle
An Evaluation of Alternative Economic Inducements to Ridesharing for the Arizona Commuter
Volume II, Research Methodology

5. Report Date: June, 1985

6. Performing Organization Code:

7. Author(s) Drs. William C. Black, David A. Plane, and Robert A. Westbrook

8. Performing Organization Report No.:

9. Performing Organization Name and Address Departments of Marketing and Geography and Regional Development, in conjunction with the Arizona Transportation and Traffic Institute and the University of Arizona; Tucson, Arizona 85721

10. Work Unit No. (TRAIS):

11. Contract or Grant No.: HPR-1-27(198)

12. Sponsoring Agency Name and Address
Arizona Transportation Research Center
Arizona Department of Transportation
206 South 17th Avenue
Phoenix, Arizona 85007

13. Type of Report and Period Covered: Final Report
Nov '83 - Feb '85

14. Sponsoring Agency Code:

15. Supplementary Notes
In cooperation with U. S. Department of Transportation
Federal Highway Administration

16. Abstract

A report is offered on a study of the relative effectiveness of alternative inducements to ridesharing in the Phoenix and Tucson metropolitan areas. The objectives are to provide evidence on the efficacy of a broad range of incentives and to establish a clearly defined methodology for such assessment.

The study was conducted in three phases:

I. Comprehensive inventory of ridesharing incentives currently employed in metropolitan areas across the country, from which a group of incentives appropriate to the Arizona study areas were selected for further analysis.

II. Surveys of both commuters and their employers were conducted. For commuters, information on present commuting arrangements, demographic and economic characteristics and general attitudes and perceptions of ridesharing, along with the conjoint analysis procedure designed to determine the effect of incentives upon ridesharing lieklihood was gathered. Employer opinions about ridesharing, the acceptability or feasibility of each incentive, and the perceived effect on their employees were also gathered.

III. A market segmentation methodology was first developed to categorize commuters based on behavioral indicators. Statistical estimation of each incentive's effect by segment was then performed. Finally, comparison of segments both within and between study areas was performed.

Volume I, 66 pages, contains Project Overview.
Volume III, 43 pages, contains Appendices.

17. Key Words	18. Distribution Statement
Ridesharing, Carpooling, Market Segmentation, Conjoint Analysis, Transportation System Management, Ridesharing Incentives Design of Ridesharing Programs	No restrictions. This report is available to the public through NTIS, Springfield, Virginia 22161

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
		54	

Form DOT F 1700.7 (8-72)

AN EVALUATION OF ALTERNATIVE ECONOMIC
INDUCEMENTS TO RIDESHARING FOR THE ARIZONA COMMUTER

TABLE OF CONTENTS

VOLUME 1

Project Overview and Findings

AN EVALUATION OF ALTERNATIVE ECONOMIC
INDUCEMENTS TO RIDESHARING FOR THE ARIZONA COMMUTER

TABLE OF CONTENTS

VOLUME 2

Research Methodology

An Evaluation of Alternative Economic
Inducements to Ridesharing
for the Arizona Commuter

TABLE OF CONTENTS

VOLUME 3

APPENDICES

AN EVALUATION OF ALTERNATIVE ECONOMIC
INDUCEMENTS TO RIDESHARING FOR THE ARIZONA COMMUTER

LIST OF APPENDICES

VOLUME 2

AN EVALUATION OF ALTERNATIVE ECONOMIC
INDUCEMENTS TO RIDESHARING FOR THE ARIZONA COMMUTER

LIST OF TABLES

VOLUME 2

AN EVALUATION OF ALTERNATIVE ECONOMIC INDUCEMENTS TO RIDESHARING FOR THE ARIZONA COMMUTER

RESEARCH METHODOLOGY

INTRODUCTION

The purpose of Volume II of this report is to detail more fully the methodological considerations underlying Phases I, II, and III of the study. Its focus is on providing the interested reader with the necessary information to evaluate individual portions of the results of as well as to detail the specific methodology employed for purposes of replication. The volume is organized into three sections corresponding to the major phases of the research.

PHASE I

The purpose of Phase I was to identify inducements to ridesharing applicable to Arizona commuters for further study in Phases II and III. Given its exploratory nature, the research design was focused on the generation of information and ideas concerning ridesharing practices currently in use as well as those inducements considered potentially useful, but not yet implemented. Before discussing the specific details of the research design and survey instrument, it is important to define the key terms used in this and other phases of the study.

Definition of Terms

The definition of ridesharing has varied considerably across studies of the travel patterns of individuals. For the purposes of this study, ridesharing is defined as:

> ...two or more persons traveling by any mode, including but not limited to: carpooling, vanpooling, public or private buspooling, taxi-pooling, shared-ride taxis or public transit.

This study focuses on ridesharing in the context of commuting between home and work, as this form of travel represents the context in which the potential for ridesharing is viewed as highest.

Of particular interest in Phase I was the identification of inducements to ridesharing in practice by various agencies in the U.S. Ridesharing inducements are defined as "specific policies and programs designed to encourage ridesharing or discourage solo driving." Thus, inducements include both incentives to rideshare and disincentives to driving alone. Inducements were grouped into three classes:

1) public information/implementation programs by ridesharing agencies (RSAs), including such programs/activities as ridematching, mass media advertising, training programs or exhibits/demonstrations, etc.; 2)incentives/disincentives by private sector organizations, such as employers or civic groups, and including preferential or paid parking or company sponsorship of vehicles for ridesharers, flexible work hours, transit discounts, etc.; and, 3) government-sponsored incentives/disincentives (including those provided by certain RSAs), such as HOV lanes, public parking limitations or surcharges, tax considerations, etc. These

three groups provide a means of categorization as well as denoting responsibility for implementation, a necessary consideration in program design.

Research Objectives

The primary objective of Phase I was to gather information as to the usage of various ridesharing inducements. To this end, three basic types of information were collected. The first type dealt with the specific inducements currently in use or used in the past by the responding organizations. For each inducement, in addition to its usage status, an evaluation of its effectiveness in inducing ridesharing was obtained. This provided a means of assessing not only the levels of usage, but those inducements that were deemed most effective as well. The second type of information concerned what were termed "wish list" inducements and were defined as inducements representing potential, but not implemented. The focus was on identifying those ideas, perhaps not fully developed or impractical in a particular situation, which the ridesharing coordinators felt would be effective in promoting ridesharing. In addition to the specific ideas, perceived organizational responsibility for each was also assessed.

The third type of information gathered related to the ridesharing coordinators' assessments of the influence of a number of area-specific characteristics on public and employer acceptance to ridesharing. The characterisitics rated included 1) amount of downtown parking, 2) concentration of employers, 3) percentage of workers in a few firms, 3) similar work schedules of employees, 4) duration of journey-to-work trip, 5) residential locations of socio-economic groups, 6) density of residential areas, 7) degree of peak hour congestion on major routes, 9) location of shopping areas vis-a-vis commuting routes, and 10) quality of public transit options. For each characteristic, an evaluation of the significance both in general (in other metro areas) and

specifically in their metropolitan area was obtained. Evaluations were obtained on an eleven point scale ranging from 0 (not at all significant) to 10 (extremely significant).

The final type of information collected was the characteristics of the organizations in terms of affiliation (governmental versus private), ridesharing budgets for 1983, number of years in operation and the population of the metropolitan area(s) served. The complete questionnaire is presented in Appendix A.

Administration of Questionnaire

The research design of Phase I called for a survey of all ridesharing coordinators in the U.S. The population to be surveyed was a list of all individuals associated with organizations involved with ridesharing compiled from 1) the May 1982 membership list of the Association of Ridesharing Professionals and 2) the May 1982 "Directory of Ridesharing Agencies and State Contacts" compiled by the National Ridesharing Information Center. In the case of multiple individuals at an organization, the individual considered most likely to be involved in ridesharing coordination was selected. Thus, while individuals constitued the population to be surveyed, the objective was to obtain as wide a coverage of organizations involved in ridesharing as possible. This process resulted in a total of 278 individuals, each of which was contacted and asked to participate in the study. After the initial mailing of questionnaires, followup procedures were employed whereby reminder postcards were mailed in two-week intervals. These reminders had the purpose of both encouraging responses of those not responding at that time and providing a second check on the delivery of the questionnaires. In several instances, the reminders reached individuals who had not received the initial questionnaire and then prompted them to request an additional survey be sent to them to allow participation. A two month time period was established for

responses, although no reponses were received after seven weeks. The tabulated results of the survey were mailed with a thank-you letter to all 105 respondents.

PHASE II

The prime purpose of Phase II was the collection of information concerning the likelihood of adoption of ridesharing from both employees and employers. Particular emphasis was placed on obtaining comparable measures bewteen these two groups whenever possible to facilitate comparison of perceptions. The following sections discuss the development of the employee and employer questionnaires and the administration procedure employed.

Employee/Commuter Survey

The purpose of the employee or commuter survey was to obtain, from both ridesharers and non-ridesharers, key information involving 1) their current commuting trip characteristics, 2) ratings of the impact various inducements or incentives would have on their likelihood of ridesharing (either the initiation of a ridesharing arrangement or the continuation of an existing ridesharing arrangement, 3) ratings as to the likelihood of ridesharing under a number of possible situations representing combinations of the incentives chosen for study, and 4) socio-demographic characteristics. Additional information on the commuting trip was collected for those individuals currently engaged in some form of ridesharing (car/vanpooling or transit use). The following sections will detail each of these informational requirements in greater detail. The actual questionnaire is presented in Appendix B so that specific question format and content can be ascertained if desired.

Current Commuting Trip Characteristics. The first information gathered from all employees provided a description of their current commuting trip on a number of dimensions. The first group of questions related to general characteristics of the commuting trip. These characteristics included: number of days commuting trip made; modes of transportation or other arrangements for commuting employed; length of the commuting trip in terms of both time and distance; and, the parking arrangements (type of facilities and cost) available at the worksite.

The second group of questions gathered information on those activities or situations which might impede the adoption of ridesharing. One such activity explored was the need or desire for access to the individual's personal vehicle during work hours. This included work-related activites, eating out for a meal, shopping, personal errands, etc. A second activity also contained in this area was the need or desire for stops to be made during the commuting trip. Occasions for which data were gathered included eating out for a meal, shopping for groceries or other items, running personal errands or getting to another job or school. A final item in this group of questions related to the frequency with which the individual's work hours were altered by either having to arrive at work early or leave late. Again, the purpose was to assess the impediments to a ridesharing arrangement due to these type of work-related or personal constraints.

The third set of questions involed gathering information regarding factors which might indicate potential for ridesharing by the individual. These questions included the satisfaction with current commuting arrangements, degree of problems encountered in the commuting trip (traffic congestion, worksite parking and trip length), attitudes toward a number of characteristics associated with ridesharing, and, finally, the probability of participating in some formal ridesharing arrangement in the next year.

Direct Rating as to Impact on Ridesharing Likelihood. The second major type of information gathered reflected the individual's assessment of the impact on his/her intentions to rideshare due to a number of selected incentives. Responses from individuals were obtained on a five point scale ranging from 0 (Would not make me any more likely to rideshare) to 4 (Would make me much more likely to rideshare). These assessments were obtained for each of the incentives listed in Table 1. While incentives were organized into seven incentive groups, ratings were made for each incentive. The specific incentives were chosen as a result of the Phase I survey of ridesharing coordinators, subsequent discussions with ridesharing officials in both major metropolitan areas (Phoenix and Tucson), and a meeting with the project's advisory committee.

Ratings of Alternative Incentive Combinations. The third task performed by the respondents was a series of ratings of the impact of nine incentive combinations on their own liklihood of ridesharing. Each incentive combination contained one incentive from each of the seven incentive groups, see Booklet II of Appendix B. These combinations, referred to hereafter as situations, were designed to present the respondent with a set of incentives from which estimates of incentive importance could be determined statistically. While the statistical considerations of the experimental design used will be discussed in the section detailing Phase III, a brief description will be provided here as well. Each situation contained one incentive from the seven groups of incentives defined earlier (e.g., setup of car/vanpool, vehicles and drivers, reimbursement, etc.). The situations were constructed so that the respondent would be exposed to situations that met three conditions: 1) all incentive groups would be represented in each situation; 2) all incentives would be portrayed an equal number of times in the nine situations; and, 3) the individual would see nine totally different situations. An example of a situation and rating scale is shown below.

SITUATION	
Setup of Car/Vanppol:	Coordinator
Vehicles and Drivers:	You drive for car/vanpool
Other Ridesharers:	Coworkers
Reimbursement:	Full Subsidy
Pick-Up-Point:	Public Parking
Highway Travel:	High Speed Lanes
Work Place Parking:	Covered

Under these circumstances I would be...

Not Any More Likely...0
to Rideshare

1

Somewhat More Likely
to Rideshare.....2

3

Much More Likely
to Rideshare.....4

A complete set of nine situations may be seen in the sample questionnaire included as Appendix B.

Socio-Demographic Characteristics. The final type of information collected for all respondents related to basic socio-demographic characteristics. Among the information requested was the respondent's sex, age, educational level, total household income, occupation, marital status and household composition.

Ridesharing Arrangements: Car/Vanpooling and Transit Use. Additional information concerning ridesharing arrangements was obtained from all repondents currently engaged in either car/vanpooling or public transit use. For each group, data regarding frequency of ridesharing, basic characteristics of the arrangement (e.g., costs, number of ridesharers) and satisfaction with the ridesharing arrangement were obtained.

Employer Survey

The second data collection task of Phase II was directed toward employers with the purpose of assessing both their current status in providing ridesharing programs, their attitudes toward implementation of additional programs and their perceptions as to the impacts that the incentives would have on their employees. Each of these information types and the specific data collected will be discussed in the following sections.

Organizational Characteristics. The first type of information gathered pertained to the type of firm and employee size. Organizations were categorized into one of ten classes: manufacturing, wholesaling/distribution, retailing, services, education, general offices, R & D laboratory, mining, agriculture, and, government. Direct assessments of employee size at worksite also were obtained.

Ridesharing Involvement. The second set of questions dealt with the organization's involvement with ridesharing and its perception of ridesharing. The first set of questions gathered data on the provision of various programs falling into four classes: parking arrangements, transit use, work hours, and ridesharing services. In addition to programs in current use, attitudinal statements were employed to assess the favorability of organizational climate toward various aspects of ridesharing. Among the aspects investigated were 1) degree of active encouragement of ridesharing, 2) degree of top management support, 3) perception of benefits of ridesharing to organization, 4) perception of benefits of ridesharing to employees, 5) perception of cost to employer, and 6) support for ridesharing by top management, by middle/lower management and by the remaining workforce.

Perceptions of Employee Impact. The third set of questions dealt with assessing the employer's perception of the impact of each incentive on the employee's likelihood of ridesharing. The purpose was to provide some measure of the congruence of employee and employer perceptions of incentive impact. While direct correspondence was not possible due to the anonymity of the employer responses, comparisons of average impact could be made. Ratings for each of the three incentives in each of the seven groups of incentives were obtained in a manner identical to that followed in the employee survey. The difference was that the employer was instructed to give their perception of how their employees would respond.

Probability of Implementation. The final information gathered for each employer was the probability of implementation of a number of employer-related ridesharing programs if not currently offered. The programs included were: provision of a computerized ridematching service free of charge; full-time ridesharing coordinator at the worksite; provision of vans or other vehicles, free of charge, for ridesharing purposes; reimbursement of one-half of all commuting costs for ridesharing employees; and, reimbursement of all commuting costs for ridesharing commuters. The probability of implementation, based on a 0% to 100% rating, was assessed under two conditions. The first condition was that the employer would absorb all costs associatied with the program, while under the second condition the employer was reimbursed by a third party for one-half of all costs.

Sampling Design and Questionnaire Administration

Sampling Design. A judgmental sampling procedure was used in selecting the firms contacted for participation in Phase II. This approach was deemed appropriate due to several requirements: the research design was not concerned with estimation of population characteristics, thus obviating the need for a randomized design; the sample should include an over-representation of ridesharers, thus firms with existing ridesharing programs must be included; firm contact was constrained due to the need to avoid excessive overlap with existing ridesharing efforts in each of the metropolitan areas; and, finally, only firms of at least several hundred employees were deemed as potential adopters of the types of programs being considered. Given these constraints, ten firms in the Tucson area and eleven firms in Phoenix were contacted and agreed to participate in the survey of both employers and employees. A list of firms and personal contacts at each firm is shown in Table 2.

Questionnaire Administration. Individuals were contacted within each organization to be responsible for distribution and collection of the self-administered questionnaire. The individuals were either personnel directors or ridesharing coordinators. In each case, these were persons having access to all members of the organization. Distribution of the questionnaires was balanced among levels of the organization, employee type and among ridesharers and non-ridesharers. Use of a personal contact within the organization was designed to increase the response rate among employees. These individuals also acted as key informants for the organization, providing the information for the employer questionnaire. While the key informant method is susceptible to bias due to personal perceptions or lack of perspective on the entire organization, careful selection of the contacts within each organization and the design of the employer questionnaire was felt to minimize these effects for purposes of this study.

A sample copy of the employer survey is given in Appendix C.

PHASE III

Phase III is primarily concerned with estimating the impact of ridesharing incentives on the likelihood of ridesharing. This analysis is conducted within specified market segments for both ridesharers and nonridesharers. In doing so, two major steps are required: the definition of target market segments, and the statistical estimation of incentive impact. These two analyses will be described in the following sections.

Development of Segmentation Scheme

The market segmentation scheme used in this study was based on two criteria: probability of ridesharing and attitude toward ridesharing. Three categories of ridesharing probability were established. The first category was for probabilities of ridesharing of less than ten percent. The second category was for probabilities of ten percent to fifty percent, while the third category was for probabilities of over fifty percent. Based on this scaling of intentions to rideshare, individuals were placed in one of three groups: low, moderate, or high probability of ridesharing. A similar analysis was then performed based on an individual's attitude toward ridesharing, with groupings of favorable, neutral, and unfavorable attitudes. The following sections detail the methodology employed for classification based on attitudes.

Identification of Attitude Statements. The first step in clarifying attitudes toward ridesharing is the identification of an appropriate measure of attitudes. Respondents were asked to express their agreement/disagreement with 26 attitude statements (Table 1). Statements were reverse-coded as appropriate so that all attitude statements reflected the degree of support for ridesharing on comparable scales. For instance, a statement of "Ridesharing is safe" denotes positive attitudes if the respondent strongly agrees. A statement such as "Ridesharing is a bother" denotes negative attitudes if strong agreement is expressed. Thus, the responses on such statements are reversed so that high levels of agreement on all questions represent positive attitudes.

Once the attitude statements were placed on comparable scales, they were analyzed for their ability to distinguish non-ridesharers versus ridesharers. The objective was to select a parsimonious subset of statements which would enable accurate differentiation of ridesharers from non-ridesharers. Discriminant analysis was employed to assess 1) the overall ability of the statements to

TABLE 1

Statements Measuring Attitudes Toward Ridesharing

Statement Number	Statement
"Compared to driving alone...	
1.	...Ridesharing is safer."
2.	...Ridesharing is a faster way to get to and from work."
3.*	...Ridesharing makes the vehicle too crowded."
4.	...Ridesharing saves money."
5.	...Ridesharing makes the ride to and from work more relaxing."
6.	...Ridesharing reduces pollution."
7.*	...Ridesharing is not a reliable way to get to work."
8.*	...Ridesharing prevents you from doing errands or shopping on the way."
9.	...Ridesharing reduces the strain of commuting."
12.	...Ridesharing reduces traffic congestion."
10.*	...Ridesharing increases the likelihood of being late for work."
11.*	...Ridesharing is more expensive than driving my own car."
13.*	...Ridesharing makes you wait."
14.	...Ridesharing gets you home from work when expected."
15.*	...Ridesharing doesn't give you enough space for your packages."
16.	...Ridesharing is convenient."
17.*	...Ridesharing is not fashionable in most social circles."
18.	...Ridesharing saves energy."
19.*	...Ridesharing is a nuisance to arrange."
20.	...Ridesharing gives you a chance to be with friends or coworkers."

Continued

TABLE 1 (Continued)

"Compared to driving alone..."	
21.*	...Ridesharing doesn't allow the flexibility of setting your own work schedule."
22.*	...Ridesharing is really sort of a bother."
23.	...Ridesharing is the 'right' thing to do."
24.*	...Ridesharing can be aggravating."
25.	...Ridesharing provides more personal security."
26.*	...Ridesharing would increase my exposure to smoking."

* Indicates statement reverse-coded before analysis.

distinguish between users of the three modes (drive alone, transit users and car/vanpoolers), and 2) those questions which are key to discriminating between the two user groups (ridesharers versus non-ridesharers). The results of the discriminant analysis for all 26 attitude statements are shown in the first column of Table 4. As can be seen, nine statements were identified as particularly important discriminators as indicated by particularly high standardized coefficients. Moreover, the set of statements resulted in a statistically significant level of discrimination between the two groups. On this basis, the nine questions were selected for a second discriminant analysis to assess the degree of discrimination lost by use of the reduced set of statements. As can be seen in the second column of the table, all statements are still significant and the overall discrimination level remains statistically significant. In terms of loss of discrimination, the percent of cases correctly classified actually increased slightly (77.25 percent with the full 26 statements compared to 77.84 percent with the nine statements). Thus, the nine statements became the basis for further attitudinal categorization. Additional analyses involving factor analysis, not described here, validated the set of nine statements as representative of the three significant factors.

Calculation of Categorization Measure. The next step involved the use of the nine statements as the basis for categorization of individuals. The approach used in this study was based on a comparison of the number of each respondent's unfavorable, neutral, and favorable statements. An individual was placed in one of three categories — favorable, neutral, or unfavorable — based on whichever contained more responses than any other (i.e., his/her modal evaluation). Thus if a respondent had given mostly favorable responses to the nine attitude statements, (s)he was classified as favorable. Two patterns of ties were possible — balanced and unbalanced. Balanced ties were those patterns of responses in which

TABLE 2

DISCRIMINANT ANALYSIS RESULTS FOR
FULL AND REDUCED ATTITUDE SCALES

Attitude Statement	Standardized Canonical Discriminant Function Coefficients	
	26-Item Attitude Scale	9-Item Attitude Scale
1.	.07627	
2.	- .01044	
3.	.06381	
4.	.03865	
5.	.00923	
6.	- .26950	- .30641
7.	.29095	.33983
8.	.08819	
9.	- .09587	
10.	- .06764	
11.	.30495	.28116
12.	- .00480	
13.	.06772	
14.	.13926	
15.	- .03626	
16.	.22038	.30221
17.	- .17566	- .14616
18.	- .01659	
19.	.11376	
20.	- .04070	
21.	.13277	
22.	.33475	.44101
23.	.28394	.28407
24.	- .35752	- .33402
25.	- .02212	
26.	.37346	.41586
Wilks Lambda	.56323	.62346
Significance	.0000	.0000
Percentage of Cases Currently Classified	77.25	77.84

favorability could not be determined. The two possible patterns in these cases were either an equal number of responses (3) in each category or an equal number of reponses (4) in both favorable and unfavorable categories. In both of these instances, the individual was classified as moderate since no strong, clear indication as to favorability or disfavorablilty is indicated. The other possibility was an unbalanced tie in which an equal number of responses (4) occurred in the neutral category and either 1) the favorable, or 2) the unfavorable category. In these cases, the individual was placed in 1) the favorable or 2) the unfavorable category.

The combination of the two categorization measures -- probability of ridesharing and attitudes toward ridesharing -- resulted in a nine-segment (3 X 3) division of the market. In keeping with the objectives of the study, four segments were selected for further study. These segments represent those groups with moderate or favorable attitudes toward ridesharing and low or moderate levels of ridesharing probability.

Estimation of Incentive Impacts

The objective of this analysis is to identify those incentive groups and individual incentives which have significant impacts on each market segment's likelihood of adopting ridesharing, if currently not ridesharing, or continuing to rideshare if currently engaged in a ridesharing arrangement. While numerous analytical procedures exist which are potential candidates for use, one procedure -- conjoint analysis -- is particularly suited for the specific requirements of this study. A fairly large number of incentives (seven) must be considered not only separately, but in combination as well. In any situation, individuals must make "tradeoffs" between incentives, since each incentive will have a different impact on likelihood of ridesharing. Thus, the analytical technique must be capable of handling multiple incentives while also controlling for the tradeoffs

that the consumer must make in evaluating any alternative combination of incentives. The particular methodology employed in this study is termed "hybrid conjoint analysis" (Green 1984), since it combines a value-expectancy model (individual's rating of an incentive's impact) with a statistical procedure to estimate each incentive's effect as well. Its advantages lie in the reduced number of incentive combinations that an individual must evaluate while also accounting for differences between individuals. In developing the data collection and estimation procedures, a number of questions must be addressed: model formulation and estimation procedure, data collection method, and stimulus-set construction. The following sections will detail more specific issues addressed in this study on each of these questions.

Model Formulation and Estimation Procedure. The hybrid conjoint model, as noted earlier, is a combination of direct ratings and conjoint estimation variables. The model may be stated mathematically as:

$$Y_{i_1 i_2 \ldots i_j} \cong \sum_{j=1}^{J} V_{i_j}$$

Where:

$Y_{i_1 i_2 \ldots i_j}$ = respondent's overall response to a full profile description containing incentive i on j incentive groups (j = 1, ..., J)

b_j = regression coefficients for incentive group j

μ_{i_j} = respondent's self-explicated rating for incentive i in incentive group j

V_{i_j} = dummy variable representing incentive i (i = 2, 3) in incentive group j

The definition of the conjoint estimation variables involved a dummy variable coding scheme representing each individual incentive within the seven incentive groups. For purposes of statistical estimation, the first incentive in each group was chosen as the base incentive against which the other incentives in each group are compared. In this study, a main-effects only model was assumed, thus

eliminating the need for the testing of interactions. While any number of estimation techniques are available, ordinary least squares (OLS) regression has been shown to be particularly robust and is thus employed as the estimation technique in this study.

Data Collection Procedure. As noted above, three types of data must be collected from each individual: 1) ratings on the impact of each incentive on ridesharing intentions, and 2) evaluations as to the likelihood of ridesharing given a number of incentive combinations. Ratings as to the impact of each incentive on ridesharing intentions were obtained through a five-point scale ranging from 0 (would not increase likelihood of ridesharing) to 4 (would increase likelihood of ridesharing a great deal). An example of the rating task for a single incentive is shown below:

SITUATION	
Setup of Car/Vanppol:	Computer List
Vehicles and Drivers:	Share Vehicles and driving
Other Ridesharers:	Anybody
Reimbursement:	Partial Subsidy
Pick-Up-Point:	Home
Highway Travel:	As a regular vehicle
Work Place Parking:	Reserved

Under these circumstances I would be...

Not Any More Likely...0 to Rideshare

1

Somewhat More Likely to Rideshare.....2

3

Much More Likely to Rideshare.....4

Collection of the ratings of incentive combinations can take two forms -- two-factor-at-a-time methods or full-profile methods. Due to the large number of incentives in this study and its ability to provide more comprehensive alternatives from which choices are to be made, the full-profile method was chosen. In this approach, each of the incentive groups are represented by one of its three alternative incentives. Thus, each combination, termed a situation, contains one incentive from each group (see discussion of Phase II for an example of data collection instrument). The respondent rates each situation on a 0 to 4

scale indicating ridesharing intentions if faced with this set of incentives. In this study, each individual rated nine situations. These ratings of the situations then becomes the dependent measure for estimation purposes.

In addition to the dependent measure and direct ratings, the dummy variable coding scheme must also be specified. Given three incentives within each incentive group, two dummy variables must be specified. The dummy variable specification for the three incentives in each group is as follows: incentive one (base incentive) -- 0,0 ; incentive two -- 1,0 ; and, incentive three -- 0,1 . Thus, fourteen dummy variables are specified to represent the twenty-one incentives examined in this study.

Stimulus Set Construction. Use of the full-profile method requires the systematic design of situations so that each incentive is presented in a comparable fashion in the set of situations. Given seven incentive groups with three incentives per group, a total of 2187 different combinations are possible. To provide for an acceptable level of replication, nine sets of nine combinations were prepared and distributed randomly among respondents. The sets of situations were developed through a fractional factorial design with 1/27th replication (Connor and Zelen 1959). The stimulus design patterns are shown in Table 5. This design insures that each individual receives a set of nine situations which contain each incentive in each incentive group three different times (balanced within individual).

Interpretation of Estimated Regression Coefficients. Given individuals' ratings of impact for each incentive and evaluations of the nine situations, estimation of incentive impacts is performed with OLS regression. In order to estimate effective incentives specific to each market segment in each metropolitan area, the estimation procedure is performed for each segment separately. Two types of regression coefficients are obtained. First, the b's in the previously given equation represent an assessment of the influence of that incentive group on

TABLE 3

FRACTIONAL FACTORIAL DESIGN EMPLOYED
IN STIMULUS SET CONSTRUCTION

Stimulus Profile Set	A	B	C	Incentive Factor D	Incentive Factor E	Pattern Levels F	Pattern Levels G
1	0	0	0	0	0	0	0
	1	1	1	1	1	2	1
	2	2	2	2	2	1	2
	0	1	2	0	1	2	0
	1	2	0	1	2	0	1
	2	0	1	2	0	1	2
	0	2	1	1	0	2	1
	1	0	2	2	1	0	2
	2	1	0	0	2	1	0
2	0	0	1	1	0	0	1
	1	1	2	2	1	2	2
	2	2	0	0	2	1	0
	0	1	2	1	0	1	2
	1	2	0	2	1	0	1
	2	0	1	0	2	2	0
	0	2	1	2	0	2	1
	1	0	2	0	1	1	2
	2	1	0	1	2	0	2
3	0	0	2	2	0	0	2
	1	1	0	0	1	2	0
	2	2	1	1	2	1	1
	0	1	2	2	0	1	0
	1	2	0	0	1	2	1
	2	0	1	1	2	0	2
	0	2	1	0	1	1	0
	1	0	2	1	2	2	1
	2	1	0	2	0	1	2
4	1	0	1	0	1	0	0
	2	1	2	1	2	2	1
	0	2	0	2	0	1	2
	1	0	1	0	1	2	0
	2	1	2	1	2	0	1
	0	1	2	0	1	1	2
	1	2	0	2	0	2	0
	2	0	1	1	2	0	1
	0	2	1	2	0	1	2
5	1	0	2	1	1	0	1
	2	1	0	2	2	2	2
	0	2	1	0	0	1	0
	1	0	2	1	1	2	1
	2	1	0	2	2	0	2
	0	1	2	0	0	1	1
	1	2	0	1	1	0	2
	2	0	1	2	2	2	0
	0	2	1	1	0	2	1
6	1	0	0	2	1	0	2
	2	1	1	0	2	2	0
	0	2	2	1	0	1	1
	1	0	0	2	1	2	2
	2	1	1	0	2	0	0
	0	1	2	1	0	0	2
	1	2	0	2	1	1	0
	2	0	1	0	2	2	1
	0	2	1	2	0	1	2
7	2	0	2	0	2	0	0
	0	1	0	1	0	2	1
	1	2	1	2	1	1	2
	2	0	2	0	2	2	0
	0	2	1	1	0	1	1
	1	0	2	2	1	0	2
	2	1	0	1	2	2	2
	0	1	2	2	1	1	0
	1	2	0	0	2	0	1
8	2	0	0	1	2	0	1
	0	1	2	2	0	2	2
	1	2	1	0	1	1	0
	2	0	2	1	2	0	2
	0	2	1	2	0	1	1
	1	0	2	0	1	2	2
	2	1	0	2	2	2	0
	0	1	2	1	0	2	1
	1	2	0	0	2	0	1
9	2	0	1	2	0	1	2
	0	1	2	0	1	2	0
	1	2	0	1	2	0	1
	2	0	1	2	0	1	2
	0	2	1	0	1	2	0
	1	0	2	1	2	0	1
	2	1	0	2	0	1	2
	0	1	2	2	1	0	2
	1	2	0	0	2	1	0

Source: Connor, W.S. and Marvin Zelen, Fractional Factorial Experiment Designs for Factors at Three Levels, National Bureau of Standards, Applied Mathematics Series, No. 54 (Washington, D.C., United States Department of Commerce).

Note: Rows represent separate incentive combinations (situations), while columns represent the seven incentive groups. The value in the column represents the specific incentive in the incentive group contained in that situation. Note that zero corresponds to the first incentive in a particular group, a one to the second incentive and two to the third incentive.

ridesharing intentions. Identification of statistically significant coefficients of this type can aid in specification of those incentives having a particularly strong effect on ridesharing intentions. The second set of coefficients (v's) are associated with the dummy variables representing each individual incentive. These may be thought of as adjustments to the direct ratings made by the individuals in the segment. They "adjust" the ratings in accordance to their actual effect when choices were made. This is the "trade-off" effect found in conjoint analysis, in which individuals may rate some incentive as having a certain level of impact, but when considered with all other incentives, its importance is either greater or less than stated.

Calculation of Part-Worth Estimates. To combine the direct and indirect effects represented by the two types of coefficients, part-worth impacts can be calculated for each incentive. These values represent the relative impact each impact has on ridesharing intentions, with the specific characteristic that they are additive across incentives. Thus, alternative combinations of incentives can be evaluated through comparison of their additive scores across the specific incentives included in each combination. The calculation of segment-level part-worth impacts is through the following equation:

$$P_{i_j} = b_j \chi_{i_j} + V_{i_j}$$

Where:

P_{i_j} = Part-worth impact of incentive i in incentive group j.

b_j = Regression coefficient incentive group j.

χ_{i_j} = Market segment mean self-explicated rating for incentive i in incentive group j.

V_{i_j} = dummy variable estimate for incentive i (i = 2, 3) for incentive group j.

As a means of graphical representation, these part-worth impacts can be plotted to show both magnitude and direction when comparing between incentives.

SUMMARY

The preceeding discussion has detailed the methodology employed in this study with regards to research design (questionnaire design, sampling plans and data collection procedures) and estimation techniques. No discussion of results are provided as they are contained in Volume I of this report.

REFERENCES

Connor, W.S. and Marvin Zelen, Fractional Factorial Experiment Designs for Factors at Three Levels, National Bureau of Standards, Applied Mathematics Series, No. 54 (Washington D.C., United States Department of Commerce).

Applied Mathematics Series, No. 54 (Washington D.C., United States Department of Commerce).

Green, Paul E., "Hybrid Models for Conjoint Analysis: An expository Review", Journal of Marketing Research, Vol. XXI (May 1984), 155-69.

THE UNIVERSITY OF ARIZONA

DEPARTMENT OF MARKETING
DEPARTMENT OF GEOGRAPHY AND REGIONAL DEVELOPMENT

A NATIONAL SURVEY OF RIDESHARING AGENCIES

The term ridesharing inducements, including both incentives to rideshare and disincentives to driving alone, can mean different things to different people. As we see it, ridesharing inducements are specific policies and programs designed to encourage ridesharing or discourage solo driving. By ridesharing we mean "two or more persons traveling by any mode, including but not limited to: carpooling, vanpooling, public or private buspooling, taxi-pooling, shared-ride taxis or public transit." For purposes of our study, we have grouped incentives and disincentives into three broad classes, as follows:

1. Public Information/Implementation Programs by Ridesharing Agencies (RSAs)
   (e.g., ride matching programs, mass media advertising, training programs, community exhibits or demonstrations, workshops, etc.)

2. Incentives by Private Sector Organizations (Employers, Civic Groups)
   (e.g., preferential or paid parking for ridesharing vehicles, company sponsorship of vehicle for ridesharing, flexible work hours, transit discounts for employees, etc.)

3. Government-Sponsored Incentives/Disincentives, including those by RSAs
   (e.g., provision of high occupancy vehicle lanes, public parking limitations or surcharges, ridesharing subsidies to individuals or organizations, preferential parking for ridesharing vehicles in public facilities, zoning variances, tax breaks/credits, etc.)

We will be asking about each in turn, beginning with the programs offered by your RSA.

PUBLIC INFORMATION/IMPLEMENTATION PROGRAMS BY YOUR RSA

Public information and implementation programs include all efforts that your RSA engages in to facilitate or encourage ridesharing within your municipality or administrative area. Please check below to indicate which programs of these types your RSA is presently using, or has used in the past. Indicate the status, in use now or in the past, in column B. In column C, put a plus (+) beside those programs especially effective and a minus beside those particularly ineffective. Leave blank the spaces for those programs neither particularly effective nor ineffective. Finally, in the last column, D, please provide any thoughts you might have as to why a program is(was) effective or ineffective.

A. Public Information/Implementation Programs By Your RSA	B. Status (current past)		C. Effectiveness (+ ,- or blank)	D. Reasons for Effectiveness/ Ineffectiveness
1.Paid Media Advertising (TV,radio)	____	____	_____	_____
2.Public Signage	____	____	_____	_____
3.Public Service Announcements	____	____	_____	_____
4.Direct Mail	____	____	_____	_____
5.TV/newspaper Publicity Releases	____	____	_____	_____
6.Community Exhibits	____	____	_____	_____
7.Educational Forums	____	____	_____	_____
8.Employer Workshops	____	____	_____	_____
9.Training Programs	____	____	_____	_____
10.Ridematching	____	____	_____	_____
Please describe below any programs not listed above				
11._____	____	____	_____	_____
12._____	____	____	_____	_____
13._____	____	____	_____	_____

PRIVATE SECTOR INCENTIVES/DISINCENTIVES

By this we mean programs offered by employers or other organizations, such as preferential parking for ridesharing vehicles, company sponsorship of ridesharing vehicle, flexible work hours, etc.

Please list below in column A the different types of private sector incentives/disincentives of which you are aware in your municipality or area of responsibility, including those offered at present as well as those offered in the past. Also, please tell us the present status of these inducements, to the best of your knowledge, by checking one of the spaces in column B. In column C, indicate whether or not your RSA has direct involvement with the program. In column D, we would like you to indicate, as you did in the previous question, if an incentive/disincentive was particularly effective (+), particularly ineffective (-) or neither particularly effective or ineffective (blank).

A. Incentives/Disincentives	B. Status		C. Affiliation	D. Effectiveness
	Now In Use	Discon-tinued	(check if with RSA)	(+ , - or blank)
1.				
2.				
3.				
4.				
5.				
6.				
7.				

GOVERNMENT-SPONSORED INCENTIVES/DISINCENTIVES

By this we mean incentives or disincentives such as provisions for high-occupancy vehicles (HOVs) (e.g.,special traffic lanes or preferential parking), subsidies for transit usage or ridesharing, parking "tax" for single-occupancy vehicles, etc.

Please list below in column A the different types of government-sponsored incentives or disincentives (other than those from your RSA) of which you are aware that are presently used or have been used in the past in your municipality or area of responsibility. Please tell us the present status of these inducements, to the best of your knowledge, by checking one of the responses in column B. In column C, indicate whether or not your RSA has direct involvement with the program. In column D, we would like you to indicate, as you did in the previous question, if an incentive/disincentive was particularly effective (+), particularly ineffective (-) or neither particularly effective or ineffective (blank).

A. Govt.-Sponsored Incentives/ Disincentives	B. Status		C. Affiliation (check if with RSA)	D. Effectiveness (+ , - or blank)
	Now In Use	Discon-tinued		
1._____	____	____	____	____
2._____	____	____	____	____
3._____	____	____	____	____
4._____	____	____	____	____
5._____	____	____	____	____
6._____	____	____	____	____

POTENTIAL INCENTIVES OR DISINCENTIVES

We are especially interested in new or innovative incentives or disincentives which you consider to have significant potential in your municipality or area. In other words, we would like to know what inducements, incentives, disincentives, etc. might be on your "wish list" -- not necessarily fully-thought out programs or policies, but rather new ideas to facilitate ridesharing. Please share these with us by listing in column A a description of the incentive/disincentive and indicating the appropriate responsibility for their implementation by circling all organizations that apply in column B.

A. Your "Wish-List" of Incentives or Disincentives	B. Organizational Responsibility (circle all that apply)
1. _____	RSA Employer Govt. Other
2. _____	RSA Employer Govt. Other
3. _____	RSA Employer Govt. Other
4. _____	RSA Employer Govt. Other

AREA-SPECIFIC INFLUENCES ON RIDESHARING INDUCEMENTS

11. Finally, please tell us about your area and what makes ridesharing in general more or less effective. What geographic, demographic, or cultural aspects of your municipality or administrative area broadly determine the effectiveness of ridesharing inducements? As in earlier questions, we are interested in your personal perceptions, opinions, theories, hunches, etc. as well as any factual data you may have on the matter.

Below we have listed a number of aspects of urban areas, and we'd like you to rate each according to its impact on the public and employer acceptance of ridesharing. We are interested both in your rating in general (i.e., across U.S. metropolitan areas) and specifically in your area(s). Please use the following rating scale and enter your responses in the boxes below.

Extremely Significant | 10....9....8....7....6....5....4....3....2....1....0 | Not At All Significant

Area-Specific Aspect	In General, In Other US Metro Areas	Specifically In Your Area(s)
Amount of downtown parking	_____	_____
Concentration of employers in few areas	_____	_____
Percentage of workers in large firms	_____	_____
Similar work schedules of employees	_____	_____
Duration of typical journey-to-work trip	_____	_____
Residential locations of socio-economic groups	_____	_____
Density of residential areas	_____	_____
Degree of peak hour congestion on major routes	_____	_____
Location of shopping areas vis-a-vis commuting routes	_____	_____
Quality of public transit options	_____	_____
Other(specify)_____	_____	_____
Other(specify)_____	_____	_____
Other(specify)_____	_____	_____

A FEW FACTS ABOUT YOUR AGENCY

We assure you that your responses in this section will never be identified with your answers to any previous questions and will be used only to check the representativeness of our national sample.

1. Which of the following best describes your agency's affiliation(s)? Check all that apply.

Governmental	Non-governmental
____ City	____ Nonprofit
____ County	____ For-profit
____ Association of govts.	
____ State	
____ Federal	

2. What is your agency's approximate budget for 1983?

Administrative budget $_____

Full-time staff _____ persons Part-time staff _____ persons

3. When did your agency formally begin operations? _____
month/year

4. What is the estimated population (as of Jan. 1, 1983) for the area your agency serves?

_____ persons

5. What metropolitan area(s) does your agency serve?

SMSA _____ Central city _____

County(ies) _____

State(s) _____

Thank you very much for your time and assistance

William Black David A. Plane Robert Westbrook

Dr. William C. Black Dr. David A. Plane Dr. Robert A Westbrook

If you would consent to possible further contact concerning the survey or other matters about ridesharing, please provide your name and phone number.

Name _____

Phone (___)_____

If you have any additional comments, provide them on the back of this page.

APPENDIX B.1

EMPLOYEE SURVEY

August 27, 1984

Dear Fellow Arizonan:

We are conducting a study of the commuting patterns of Arizona residents on behalf of the Arizona Department of Transportation in conjunction with the Arizona State University Transportation Research Center. In particular, we are interested in your opinions about ridesharing. The results will be of great use in developing ridesharing programs in major Arizona communities.

Please accept our thanks for agreeing to participate in the study and taking your valuable time to answer the questions that follow in the booklets. Not only are we interested in what you think about ridesharing but also the likelihood of your participation in this type of program if certain options were offered by your employer to make it more attractive. Even if you are not interested in ridesharing, it is important that we know what you think . Whatever your opinions are, they will be held in the strictest confidence and in no way be associated with you or your company.

There are two booklets to be filled out. Booklet 1 is to be completed first. Then take a break until you have some time, about 30 minutes, to complete Booklet 2. Filling out both booklets should not take longer than 45 minutes to an hour. Please be sure to complete both booklets, as your answers in each are needed to get a full description of your opinions about ridesharing.

The time you spend in providing us with information will aid in the success of ridesharing programs in the years to come. If you have any questions or need additional information, please feel free to call Debra Larson in Tucson at the University of Arizona Marketing Department, 602-621-7479.

Please return this survey to the person designated on the front of this envelope no later the date indicated on your questionnaire. An envelope has been provided to insure the confidentiality of your response.

Thank you very much for your time and assistance.

Sincerely,

Dr. William C. Black
Assistant Professor of Marketing

Dr. David A. Plane
Assistant Professor of Geography

Dr. Robert A. Westbrook
Associate Professor of Marketing

THE UNIVERSITY OF ARIZONA

DEPARTMENT OF MARKETING
DEPARTMENT OF GEOGRAPHY AND REGIONAL DEVELOPMENT

BOOKLET 1

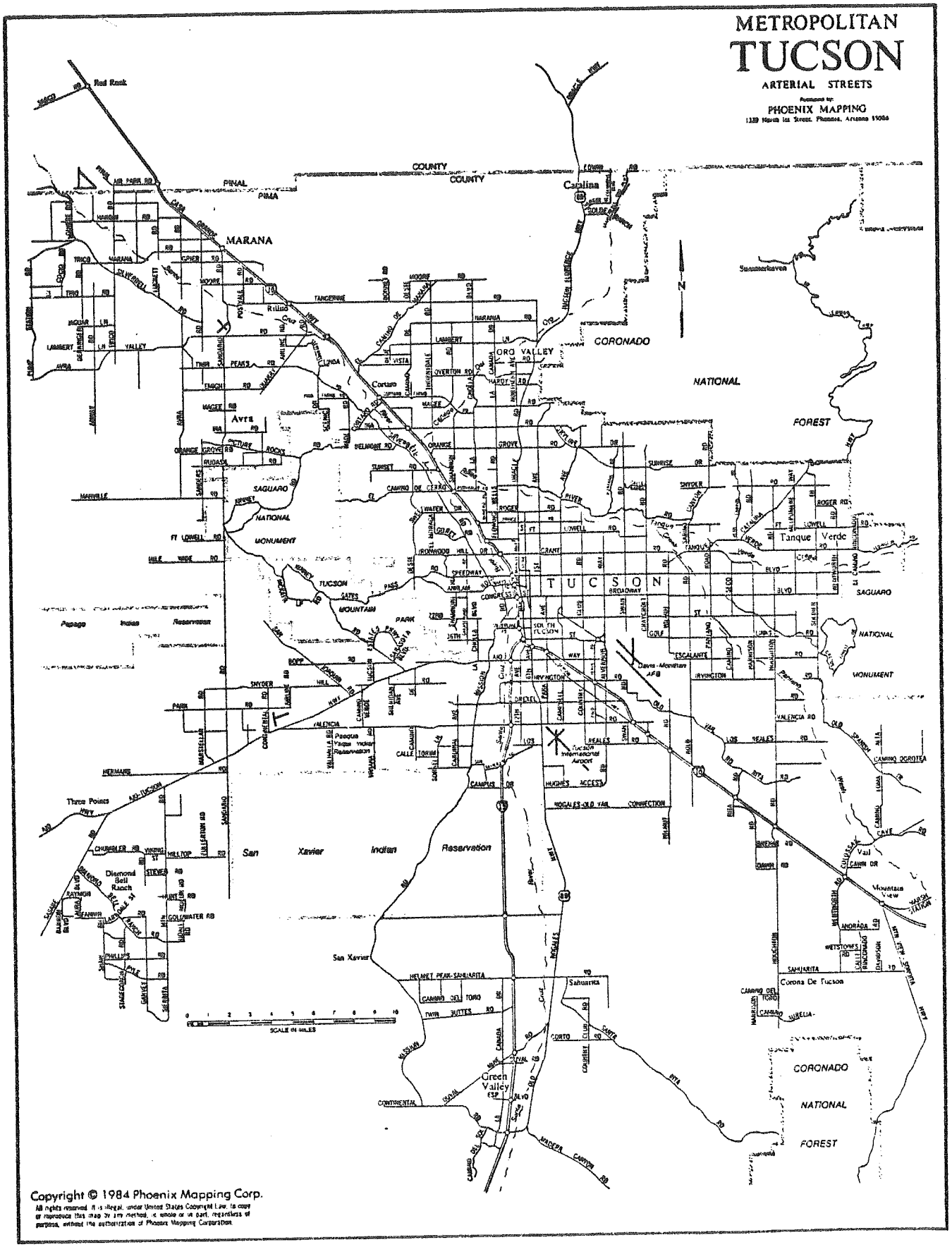
Your Home to Work Trip

and

Opinions about Ridesharing

General Instructions:

Complete Booklet 1 first before proceeding to Booklet 2. Answer the questions to the best of your ability, remembering that there are no right or wrong answers. Please work through all sections of Booklet 1, starting with Section I and working your way to Section IV. Read the instructions at the beginning of each section to determine if you should answer that section, or skip to the next one if it does not apply to you. Please answer all sections that apply to you.


METROPOLITAN
TUCSON
ARTERIAL STREETS
PHOENIX MAPPING
PINAL COUNTY
PIMA COUNTY
MARANA
ORO VALLEY
CORONADO NATIONAL FOREST
SAGUARO NATIONAL MONUMENT
TUCSON
Tanque Verde
Catalina
Avra
Rillito
Continental
Green Valley
Sahuarita
Corona De Tucson
San Xavier Indian Reservation
Three Points
Davis-Monthan AFB
Tucson International Airport
Pascua Yaqui Indian Reservation
Papago Indian Reservation
Mountain View
Summerhaven
SCALE IN MILES
Copyright © 1984 Phoenix Mapping Corp.

SECTION II: Your Opinions About Ridesharing (Carpooling or Vanpooling)

In this section of the questionnaire we're interested in your overall opinions and impressions of ridesharing. Please give us your opinions even if you are not presently ridesharing or if you have never rideshared before.

To clarify, ridesharing is defined as "two or more individuals who agree to travel with each other on a regular basis to their work destination."

(1) Listed below are some statements about ridesharing compared to driving alone to and from work. Please consider each statement carefully and check under the column that tells how much you agree or disagree with the statement. There are no right or wrong answers. Please give us your impressions, even if you're not absolutely certain.

Compared to driving alone ...	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
... Ridesharing is safer	_____	_____	_____	_____	_____
... Ridesharing is a faster way to get to and from work	_____	_____	_____	_____	_____
... Ridesharing makes the vehicle too crowded	_____	_____	_____	_____	_____
... Ridesharing saves money	_____	_____	_____	_____	_____
... Ridesharing makes the ride to and from work more relaxing	_____	_____	_____	_____	_____
... Ridesharing reduces pollution	_____	_____	_____	_____	_____
... Ridesharing is not a reliable way to get to work	_____	_____	_____	_____	_____
... Ridesharing prevents you from doing errands or shopping on the way	_____	_____	_____	_____	_____
... Ridesharing reduces the strain of commuting	_____	_____	_____	_____	_____
... Ridesharing increases the likelihood of being late for work	_____	_____	_____	_____	_____
... Ridesharing is more expensive than driving my own car	_____	_____	_____	_____	_____

(2) Now to summarize, please place a checkmark in the spaces below between each pair of words to describe your overall impressions of ridesharing. You may check any space between the two extremes; the closer your checkmark to the word in the pair, the better that word describes your personal impression.

Ridesharing is...

good	____:	____:	____:	____:	____:	____:	____:	bad
wise	____:	____:	____:	____:	____:	____:	____:	foolish
desirable	____:	____:	____:	____:	____:	____:	____:	undesirable

(3) Looking ahead over the next 12 months, how likely would you say it is that you will personally be involved in some form of ridesharing to work on a regular basis? Please circle the number below that best describes the chances:

Chances That You Will Be Ridesharing

0%...10%...20%...30%...40%....50%...60%...70%...80%...90%...100%

Will Definitely Not be Ridesharing — May be Ridesharing — Will Definitely be Ridesharing

(4) In your metropolitan area, what percentage of people would you suppose rideshare when traveling to work? Please give us your best estimate, even if it's just a guess.

____ None
____ Less than 1%
____ 1-5%
____ 6-15%
____ 16-30%
____ 31-50%
____ 51-100%

(5) Which of the following are presently available from your employer? (Please check all that apply.)

[ ] Flexible work hours
[ ] Reserved parking for rideshare vehicles
[ ] Ridematching service
[ ] Time off during work hours to meet to arrange ridesharing transportation
[ ] Company-owned van provided for ridesharing
[ ] Parking expenses reimbursed or free parking for ridesharing vehicles
[ ] Employee discounts on bus passes
[ ] Express bus service to/from work
[ ] Don't know about any of my employers ridesharing programs

(6) Other than the items listed in question 5, does your employer currently do anything else to encourage ridesharing?

[ ] No [ ] Yes. What?_____
[ ] Don't Know

The next sections of the questionnaire (IIIa and IIIb) are to be completed by persons currently sharing a ride to and from work on a regular basis. IF YOU ARE NOT CURRENTLY RIDESHARING TO WORK IN A CAR OR VANPOOL OR TAKING THE BUS, DO NOT COMPLETE SECTION IIIa OR IIIb. Go to Section IV of this questionnaire.

... If you are sharing a ride in a carpool or vanpool, answer the questions in Section IIIa below.
... If you are take a bus as your form of ridesharing, answer the questions in Section IIIb on the next page.

SECTION IIIa: Your Present Ridesharing Activities

This section of the questionnaire is to be completed by persons currently sharing a ride to and from work on a regular basis in a car or van pool. If you are ridesharing by bus, do not complete this section but go to Section IIIb.

(1) How many days a week do you share a ride to work:

1 2 3 4 5 6 7 days

(2) How many other people do you usually share a ride with?

1 2 3 4 5 or more people

(3) Of the people that ride with you to and from work, how many work at the same location as you, and how many work at a different location?

_____ Number who work at the same location
_____ Number who work at different location

(4) How many days a month do you drive for your carpool or vanpool? (Put a zero if you never drive the carpool or vanpool.)

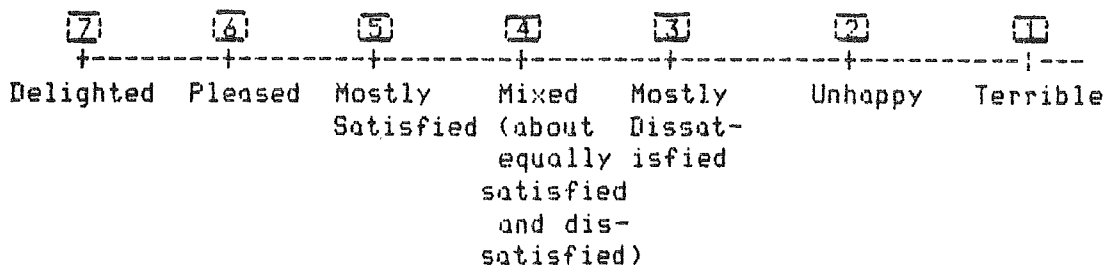
_____ Number of days a month

(5) In your ridesharing, do you reimburse the other members for any expenses or are you reimbursed by them? (Check only one)

[ ] No
[ ] Yes, share expenses with others $____ Cost to you per week
[ ] Yes, others pay me $____ Amount paid to you per week

(6) How satisfactory would you say your ridesharing experiences have been? Please circle one of the numbers or letters below (1 to 7, A,B, or C) to tell us your experiences.

I feel:



A Neutral (No Feelings-Neither Satisfied nor Dissatisfied)
B I never thought about it
C Does not apply to me

SECTION IV: Statistical Data

For statistical purposes, please tell us a few key facts about yourself. Of course, all of your answers will be kept in the strictest confidence, and will not be associated with you or your company in any way.

(1) Are You... _____ Male _____ Female

(2) Which age category do you fall into?

_____ under 25 years
_____ 25-34
_____ 35-44
_____ 45-54
_____ 55-64
_____ 65 or over

(3) What is the highest grade of school you have finished?

_____ up to grade 11 or lower
_____ Completed High school
_____ 1 to 3 years of college/junior or community college graduate
_____ College graduate (4 years)
_____ Post graduate work

(4) In which of the following categories was your total family income last year?

_____ under $10,000
_____ $10,000 - 19,999
_____ $20,000 - 29,999
_____ $30,000 - 39,999
_____ $40,000 - 49,999
_____ $50,000 or more

(5) What is your present marital status?

_____ Married
_____ Single (never Married)
_____ Separated or Divorced
_____ Widowed

(7) Finally, which of the following job classifications best describes the position in which you are currently employed? (Please check only one).

[ ] Professional
[ ] Managers and Administrators
[ ] Sales
[ ] Clerical and Support Staff
[ ] Craftsman
[ ] Assembly or Linework
[ ] Laborers
[ ] Service Workers

(8) In the spaces provided below, please describe the members of your household. For those who are employed outside the home please tell us their employement status.

	Number in Total	Number Employed Full Time Outside the Home	Number Employed Part Time Outside the Home
Male Adults	_____	_____	_____
Female Adults	_____	_____	_____
Children, ages 12-16	_____	_____	_____
Children, ages 6-11	_____		
Children, under age 6	_____		

THE UNIVERSITY OF ARIZONA

DEPARTMENT OF MARKETING
DEPARTMENT OF GEOGRAPHY AND REGIONAL DEVELOPMENT

BOOKLET 2

Ridesharing Incentives and Situations

General Instructions:

Please take a break after completing Booklet 1 before starting Booklet 2. It will take about 30 minutes, so please allow enough time to complete it without interruptions.

Setup_of_Car/Vanpool: Let's take the first factor, "Setup of Car/Vanpool." Here are three possible options in which the initial pooling arrangements could be made. If all other things were equal, how much would each option increase your likelihood to rideshare? On the five point scale indicate how much each option would increase your likelihood of ridesharing.

Setup_of_Car/Vanpool:	Would Not Make Me Any More Likely to Rideshare		Somewhat More Likely to Rideshare		Would Make Me Much More Likely to Rideshare
a) SELF-ARRANGED: You contact anybody who might be interested and set up the rideshare group yourself.	0	1	2	3	4
(b) COMPUTER LIST: You receive a computerized list of interested people and call them to set up your own rideshare group.	0	1	2	3	4
(c) COORDINATOR ARRANGES: A ridesharing coordinator personally contacts you and matches you with other people, setting up the best ridesharing pool for your situation.	0	1	2	3	4

Vehicles_and_Drivers: The second factor concerns the ownership of the vehicle and who does the driving. Again there are three possibilities. Note that this factor deals only with vehicle ownership and driving, not the cost of operation. This is dealt with in a later factor. On the five point scale, indicate how much each factor would increase your likelihood of ridesharing.

Vehicles_and_Drivers	Would Not Make Me Any More Likely to Rideshare		Somewhat More Likely to Rideshare		Would Make Me Much More Likely to Rideshare
(a)SHARE VEHICLES AND DRIVING: All members of the group take equal turns driving their own vehicles and share expenses.	0	1	2	3	4
(b)YOU DRIVE FOR CAR/VANPOOL: You provide a car or van and do all the driving for the other riders and you are reimbursed for your expenses.	0	1	2	3	4
(c)DRIVEN IN EMPLOYER OWNED VEHICLE: Your employer provides a car or van, and you never have to drive.	0	1	2	3	4

Pick Up Point: Here we are dealing with where a ridesharing pool might pick you up. The three options are:

Pick Up Point:	Would Not Make Me Any More Likely to Rideshare		Somewhat More Likely to Rideshare		Would Make Me Much More Likely to Rideshare
(a)PARK&RIDE LOT: Riders in the pool are picked up and dropped off at a special "Park & Ride" lot, with security and an enclosed waiting area, within 2 miles of your home.	0	1	2	3	4
(b)HOME: Riders are picked up and dropped off at their homes.	0	1	2	3	4
(c)PUBLIC PARKING: Riders are picked up and dropped off at a designated area in a public parking lot within 1 mile of home.	0	1	2	3	4

Highway Travel: The next factor concerns highway travel opportunities which the ridesharing vehicle might have available. Please tell us how much each of the three following options would affect your likelihood of ridesharing.

Highway Travel:	Would Not Make Me Any More Likely to Rideshare		Somewhat More Likely to Rideshare		Would Make Me Much More Likely to Rideshare
(a)AS A REGULAR VEHICLE: Ridesharing vehicles are treated just like all other vehicles on the highway.	0	1	2	3	4
(b)IMMEDIATE VEHICLE ACCESS: Ride-sharing vehicles have immediate access to the highway during rush-hour when freeway entrances are congested.	0	1	2	3	4
(c)HIGH SPEED LANES: Ridesharing vehicles travel in high-speed, low-congestion lanes reserved for use only by ridesharing vehicles.	0	1	2	3	4

POSSIBLE RIDESHARING SITUATIONS: CAR/VANPOOL

So that we understand your thinking about ridesharing, we have one more task for you to complete. In this task, we will be referring to the various ridesharing alternatives already discussed above. We will be using the abbreviations and short hand notations made earlier to refer to the various ridesharing options. Feel free to turn back if you need to refresh your memory.

This time, however, we would like you to consider several different imaginary situations, involving possible ridesharing arrangements. For each situation, we'd like you to tell us how likely you would be to rideshare under those circumstances.

Please try to visualize each of the following imaginary situations. As you read the descriptions that follow, put yourself in the situation and think about whether it makes you feel any more inclined to begin ridesharing to work on a regular basis. At the end of each situation description, you will find a rating scale to tell us how likely you would be to begin ridesharing on a regular basis if the circumstances described were actually true.

(Remember, we are using abbreviations from the earlier tasks. Look back if you need to recall or clarify anything.)

SITUATION #1

Setup of Car/Vanpool:	Coordinator
Vehicles and Drivers:	Share vehicles and driving
Other Ridesharers:	Anybody
Reimbursement:	Car/vanpool Reimbursement
Pick-Up-Point:	Public Parking
Highway Travel:	As a regular vehicle
Work Place Parking:	Free

Under these circumstances I would be...

Not Any More Likely...0 to Rideshare

1

Somewhat More Likely to Rideshare.....2

3

Much More Likely to Rideshare.....4

Next, please consider the following situation. Then please tell us how likely you would be to begin ridesharing to work on a regular basis assuming these circumstances were actually true.

SITUATION #2

Setup of Car/Vanpool:	Self-arranged
Vehicles and Drivers:	You drive for car/vanpool
Other Ridesharers:	Coworkers
Reimbursement:	Partial Subsidy
Pick-Up-Point:	Park & Ride lot
Highway Travel:	High speed lanes
Work Place Parking:	Reserved

Under these circumstances I would be...

Not Any More Likely...0 to Rideshare

1

Somewhat More Likely to Rideshare.....2

3

Much More Likely to Rideshare.....4

SITUATION #7

Setup of Car/Vanpool:	Computer List
Vehicles and Drivers:	You drive for car/vanpool
Other Rideshares:	Anybody
Reimbursement:	Full Subsidy
Pick-Up-Point:	Public Parking
Highway Travel:	Immediate vehicle access
Work Place Parking:	Free

Under these circumstances I would be...

Not Any More Likely...0 to Rideshare

1

Somewhat More Likely to Rideshare.....2

3

Much More Likely to Rideshare.....4

SITUATION #8

Setup of Car/Vanpool:	Coordinator
Vehicles and Drivers:	Driven in employer vehicle
Other Rideshares:	Coworkers
Reimbursement:	Car/vanpool Reimbursement
Pick-Up-Point:	Park & Ride lot
Highway Travel:	As a regular vehicle
Work Place Parking:	Reserved

Under these circumstances I would be...

Not Any More Likely...0 to Rideshare

1

Somewhat More Likely to Rideshare.....2

3

Much More Likely to Rideshare.....4

SITUATION #9

Setup of Car/Vanpool:	Self-arranged
Vehicles and Drivers:	Share vehicles and driving
Other Rideshares:	Other employees
Reimbursement:	Partial Subsidy
Pick-Up-Point:	Home
Highway Travel:	High speed lanes
Work Place Parking:	Covered

Under these circumstances I would be...

Not Any More Likely...0 to Rideshare

1

Somewhat More Likely to Rideshare.....2

3

Much More Likely to Rideshare.....4

(7)

Of the nine situations you just examined, which situation makes you the most likely to rideshare?

_____ (Enter one Situation number from above)

APPENDIX B.2

EMPLOYER/COMMUTER
QUESTIONNAIRE

Employer's Portion of Ridesharing Survey

Notice of Confidentiality

All information provided herein will be kept in strictest confidence. It will never be associated with the particular responding individuals and their employers. Its purpose is background for understanding the employee survey recently completed.

Dr. William C. Black

Dr. David A. Plane

Dr. Robert A. Westbrook

5. Next, please tell us your impressions of your employer's attitude toward ridesharing by its employees. Please be certain to restrict your comments to your views of the attitudes which prevail within your employer's organization rather than your own personal views.

a. To what extent is employee ridesharing actively encouraged?

+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
Strongly Encouraged				Neither Encouraged Nor Discouraged						Strongly Discouraged

b. To what extent is there top management support and enthusiasm for ridesharing?

+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
Strongly Supported				Neither (Neutrality)						Strongly Opposed

c. To what extent is ridesharing seen as beneficial to the employer's organization (rather than the employees)?

+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
Seen as Highly Beneficial				Neither Beneficial Nor Detrimental						Seen as Highly Detrimental

d. To what extent is ridesharing seen as beneficial to the employees involved?

+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
Seen as Highly Beneficial				Neither Beneficial Nor Detrimental						Seen as Highly Detrimental

e. To what extent is ridesharing seen as costly to the employer?

10	9	8	7	6	5	4	3	2	1	0
Seen as Very Costly To Operate										Seen as No Cost To Operate

First, for each factor, we'd like you to tell us how much each option listed below would stimulate increased ridesharing among your employees. On the scale below please rate how much each option would increase the likelihood of employee ridesharing.

Would Not Increase Likelihood Of Ridesharing	Would Increase Likelihood of Ridesharing Somewhat	Would Increase Likelihood of Ridesharing A Great Deal
0 1	 2	..... 3 4

Working Hours: For example, suppose the factor were "Working Hours" with three options: no time off for ridesharers, ridesharers get to leave 10 minutes early, or ridesharers get to leave work 20 minutes early.

Working hours:	Would Not Increase Likelihood Of Ridesharing		Would Increase Likelihood Somewhat		Would Increase Likelihood Of Ridesharing A Great Deal
(a) No time off for ridesharing	(0)	1	2	3	4
(b) Ridesharers leave 10 minutes early	0	1	(2)	3	4
(c) Ridesharers leave 20 minutes early	0	1	2	3	(4)

Suppose that option (a) had no effect on your employees' likelihood of ridesharing. You would then circle "0", as shown above.

Next we consider option (b) above. If ridesharers got to leave 10 minutes early, what effect would this fact have on your employees' likelihood of ridesharing? Suppose your answer was "Would be somewhat more likely to rideshare," then you would circle the number "2" to describe your answer.

And finally, consider option (c) above. If the fact that ridesharers got to leave 20 minutes early made your employees much more likely to rideshare, then circle the number "4." Of course you may use any number between "0" and "4" to give us your feelings. And make certain you answer for all three options listed under each factor, as we did for (a), (b), and (c).

Each of the seven factors will be presented below, along with the options for each figure. You are to answer each question by circling the point on the scale that indicates how much each option would increase your employees' likelihood of ridesharing.

Other Ridesharers: The third factor deals with the other people in the ridesharing group. Consider the following three alternatives, and tell us how much each would increase your employees' likelihood of ridesharing.

	Would Not Increase Likelihood Of Ridesharing		Would Increase Likelihood Somewhat		Would Increase Likelihood Of Ridesharing A Great Deal
Other Ridesharers:					
(a) CO-WORKERS: The other members of the ridesharing pool are all people from your place of work who know each other.	0	1	2	3	4
(b) OTHER EMPLOYEES: The other members of the ridesharing pool also work for the same employer, but are unknown to each other.	0	1	2	3	4
(c) ANYBODY: The other members of the ridesharing pool are anybody going to the same general vicinity as your employees.	0	1	2	3	4

Reimbursement of Operating Costs: The fourth factor concerns the reimbursement, if any, that might be made available to your employees' to offset the cost of commuting to work (i.e. gas, oil, vehicle maintenance, etc.) in a ridesharing arrangement. The three options are:

	Would Not Increase Likelihood Of Ridesharing		Would Increase Likelihood Somewhat		Would Increase Likelihood Of Ridesharing A Great Deal
Reimbursement:					
(a) CAR/VANPOOL REIMBURSEMENT: Members of the ridesharing pool pay their own expenses or share them as a group	0	1	2	3	4
(b) PARTIAL SUBSIDY: One-half of the vehicle operating costs are paid for by a third party (such as your employer, a federal ridesharing agency, etc.)	0	1	2	3	4
(c) FULL SUBSIDY: All the vehicle operating costs are paid for in full by a third party.	0	1	2	3	4

Work Place Parking: The final factor concerns parking at the work site. The three options we'd like you to consider are listed below. As previously, please tell us how much each one would affect your employees' likelihood of ridesharing.

	Would Not Increase Likelihood Of Ridesharing		Would Increase Likelihood Somewhat		Would Increase Likelihood Of Ridesharing A Great Deal
Work Place Parking:					
(a) FREE PARKING: Ridesharing vehicles park free in employer lot or pay parking lot while other vehicles pay.	0	1	2	3	4
(b) RESERVED PARKING: Special reserved parking for ridesharing vehicles is available at the closest point to the work building.	0	1	2	3	4
(c) COVERED PARKING: Covered parking is available only for ridesharing vehicles, at the closest point to the work building.	0	1	2	3	4

Now that you have seen all seven factors, one at a time, we'd like to know how important you feel they are as a group. Assume you have 100 points which you can assign in any way you wish to the seven factors, shown again below. The idea is to assign the 100 points so as to reflect the relative importance of each factor in determining the likelihood of your employees ridesharing to work in a car or van.

Setup of Car/Vanpool	_____
Vehicles and Drivers	_____
Other Ridesharers	_____
Reimbursement	_____
Highway Travel	_____
Work Place Parking	_____
Total	100 points

We would now like to know your views on adoption of the options if your employer was reimbursed for one-half of any costs incurred in these programs. Again use the scale ranging from 0 to 100%.

Option	Currently Offering	Chance of Adoption With Employer Paying One-Half of Costs
Employees provided with a computerized ridematching free of charge to employee	X	0..10..20..30..40..50..60..70..80..90..100
A full-time ridesharing coordinator is available to help arrange schedules	X	0..10..20..30..40..50..60..70..80..90..100
Vans are provided, free of charge, for ridesharing employees	X	0..10..20..30..40..50..60..70..80..90..100
One-half of all commuting costs are paid for ride-sharing employees	X	0..10..20..30..40..50..60..70..80..90..100
All commuting costs are paid for ridesharing employees	X	0..10..20..30..40..50..60..70..80..90..100

We hope that considering the perspectives of both employee and employer will help us to understand better the factors that can possibly effect an increase in ridesharing. We wish to extend our sincerest appreciation both for your participation in this survey and your cooperation in administering the employee questionnaire.