The Commuter Assistance Program
Evaluation Manual

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The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the State of Florida Department of Transportation. This document was prepared in cooperation with the State of Florida Department of Transportation.
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Chapter One
Introduction

The Florida Commuter Assistance Program (CAP) is an important and integral part of the Florida Department of Transportation's (FDOT) program to meet transportation needs in the State of Florida. Specifically, the development of a statewide network of CAP offices was completed to offer travel choices to Florida's commuters. According to the official FDOT procedures the Florida Commuter Assistance Program is described as:

"Coordinated use of existing transportation resources can provide a responsive, low cost, alternative for alleviating urban highway congestion, improving air quality and reducing the need for costly highway improvements. The commuter assistance program focuses on the single occupant commuter trip which is the greatest cause of peak hour highway congestion. A coordinated effort to provide alternatives to these commuters using existing or low cost resources, can be beneficial to the development of public transit statewide, the attainment of the Department's program objectives for meeting the transportation needs of the disadvantaged, and the Department's priority efforts to relieve traffic congestion, improve air quality, and to assure energy conservation."

As part of their efforts to ensure that Florida's transportation needs are addressed, the FDOT has specific program requirements for each FDOT District Office and each CAP office. These requirements include establishing specific and achievable program objectives, a listing of tasks to undertake and key activities to perform, reporting on each project's performance including written reports, and measurable goals and objectives with milestones to determine progress in stated emphasis areas. All of these requirements are intended to provide the Department with a tool to evaluate how well CAP offices are meeting FDOT priority efforts to relieve traffic congestion, improve air quality, and to assure energy conservation.

This manual was developed to assist Florida's Commuter Assistance Programs (CAP) in their efforts to measure and evaluate their performance. As such, this manual will focus on providing the information necessary for a CAP to devise and conduct their own evaluation program. It will also provide guidance on how to report the results of that evaluation so that key CAP funders, elected officials, and the general public can understand and appreciate the efforts of the CAP in addressing traffic congestion, air quality, and mobility concerns.

For the ease of use, this manual has been divided into chapters covering specific areas of evaluation. These are:
Chapter Two focuses on the performance measures that a CAP can use to evaluate program progress and record achievements. Included in this chapter are definitions for FDOT required performance measures, FDOT optional performance measures, and a set of other performance measures that a CAP could use to measure effectiveness and/or report progress. Also included are tables which can be used by a CAP to report results and to track progress.

Chapter Three examines the different types of evaluation that a CAP office may undertake to measure performance and/or progress. Included are descriptions of techniques such as needs assessments, formative evaluation, summative evaluation, and others. Each is described to help the CAP office determine what evaluation is most appropriate to accomplish evaluation objectives.

Chapter Four discusses the different types of survey methodologies that can be used by a CAP office. These include a variety of data collection methods, such as focus groups and mail surveys, as well as sampling considerations.

Chapter Five serves as an introduction to basic statistics. It is intended to provide a working knowledge of statistical principles that can impact a CAP evaluation. The focus is on such items as confidence intervals, statistical differences, and other important characteristics that can impact the quality and reliability of a CAP evaluation program and its results.

Chapter Six addresses survey planning and budgeting. It provides guidance on times at which evaluation is conducted (i.e. season, frequency), examines externalities that may influence the survey, and budgeting issues that must be considered when designing a survey. The chapter also provides guidance on survey costs.

Chapter Seven deals with how evaluation findings can be communicated to those who need to know. This includes a discussion of who needs to know what and when, how to communicate findings, and how to compare CAP findings with other programs.

As each CAP begins to design its own evaluations, it should keep in mind that everyone who examines the evaluation results will bring different expectations and experiences to the review. For example, an MPO may seek to determine how well the CAP is achieving regional transportation objectives. Funders will seek to ensure that funds are being spent in a cost effective manner. To address each of these different expectations, the CAP must carefully design an evaluation that takes into consideration these viewpoints. This manual will provide guidance on important considerations for a CAP that lead to successful evaluations.
Chapter Two
Performance Measures

INTRODUCTION

This chapter will focus on the performance measures available to Florida Commuter Assistance Program (CAP) offices to determine program progress and/or effectiveness. The performance measures are divided into three sections: required performance measures; optional performance measures; and other performance measures. As the name suggests, required performance measures are those that the Florida Department of Transportation (FDOT) Central Office has mandated that all CAP offices in Florida must track and report on at least an annual basis. These performance measures are specified on pages 8-9 of the Commuter Assistance Program procedures, dated May 5, 1997. District optional performance measures are those that FDOT have determined are appropriate for some of the CAP programs and, at CAP and FDOT District option, can be reported to show progress and/or performance. Other performance measures are those that can help a CAP illustrate the effectiveness of their programs in meeting program or regional objectives.

SECTION A - REQUIRED PERFORMANCE MEASURES

The FDOT required performance measures are:

1. Number of commuters requesting assistance
2. Number of commuters switching modes
3. Number of vans in service (where applicable)
4. Number of vehicle trips eliminated
5. Vehicle miles eliminated
6. Employer contacts
7. Major accomplishments
8. Parking spots saved/parking needs reduced
9. Commuter costs saved

The following tables have been developed to assist the Commuter Assistance Agencies in Florida track their performance relative to FDOT requirements. The tables are constructed with five supporting columns to help the CAP collect, analyze, and disseminate the results of the performance measures. The first column describes actions that the CAP agencies take to achieve program goals, or potential activities that could be incorporated to achieve the goal. The second column includes the performance measures that are required by FDOT. The third column is used if benchmarks or actual results are available for each performance measure. These benchmarks/results could be taken from survey responses, from past commuter assistance program evaluation reports, or from data available from other similar CAP programs. The fourth column lists the source for evaluating achievement of the performance measure (i.e.
database survey). The fifth column can be used by the commuter assistance program to select targets to achieve for each of the performance measures. The sixth column can be used by CAP staff to explain why the selected targets have been set.

Following each of the tables, a brief description of each performance measure is included along with the method to be used to collect the necessary information. Where appropriate, the formula for calculating the performance measure is included.

Because some of the required performance measures require the CAP to survey their database, a sample survey has been included as Appendix A. This survey provides the basic framework needed to collect all necessary information. The CAP can use this survey, develop one on their own, or use this one as a basis for a more comprehensive survey instrument. Appendix B provides a sample completed survey to show how one database member may answer the survey questions. For assistance in developing surveys, contact the TDM Clearinghouse at the Center for Urban Transportation Research at (813) 974-9813 or SUNCOM 574-9813.
<table>
<thead>
<tr>
<th>Action</th>
<th>Performance Measures</th>
<th>Benchmark/Results</th>
<th>Source</th>
<th>Targets</th>
<th>Contributing Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA1.1 Provide info to commuters about commute alternatives</td>
<td>RP1 Number of Commuters requesting assistance</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RA1.2 Develop matching system</td>
<td>RP2 Number of commuters switching modes</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>RA1.3 Contract for and/or provide vans for commuting purposes</td>
<td>RP3 Number of vans in service</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RA1.4 Develop marketing program to:</td>
<td>RP4 Number of vehicle trips eliminated</td>
<td></td>
<td>Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Promote carpooling</td>
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<tr>
<td>b) Promote vanpooling</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>c) Promote transit use</td>
<td></td>
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<tr>
<td>d) Promote walk/bike</td>
<td></td>
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<tr>
<td></td>
<td>RP5 Vehicle miles eliminated</td>
<td></td>
<td>Survey</td>
<td></td>
<td></td>
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<tr>
<td>Action</td>
<td>Performance Measures</td>
<td>Benchmark/Results</td>
<td>Source</td>
<td>Targets</td>
<td>Contributing Factors</td>
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</tr>
<tr>
<td>RA1.5</td>
<td>RP6 Employer contacts</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RP7 Major accomplishments</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RP8 Parking spots saved/parking needs reduced</td>
<td>Survey (based on veh. trips reduced)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RP9 Commuter Costs saved</td>
<td>Survey (based on veh. miles eliminated)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Definitions of Required Performance Measures

RP1 Number of commuters requesting assistance

This is the number of people that request assistance of some sort including:
- Carpool matchlist
- Vanpool matchlist or formation assistance
- Transit route and/or schedule information
- Telecommuting information
- Bicycle route and/or locker/rack information

The CAP offices would track the number of requests received and may want to track requests by type. The information would be reported as part of quarterly and annual progress reports.

RP2 Number of commuters switching modes

This is the number of people that actually use the information you provide to change from their SOV mode to carpooling, vanpooling, transit use, telecommuting, walking and/or bicycling.

This information can be gathered by doing sample survey of commuters assisted on a monthly basis by either phone or mail. Every month contact a random sample of the commuters assisted the previous month to see how many actually used the information provided. Extrapolate survey results to estimate total. It is recommended that actual data be used where available.

RP3 Number of vans in service (where applicable)

This measure represents the actual number of commuter vans on the road and/or the number of vanpoolers. These numbers would be collected and reported by the CAP office.

RP4 Number of vehicle trips eliminated

This performance measure is calculated by using follow-up survey data or actual data. To calculate, complete the following steps (Appendix B is a completed sample survey that was used to develop the example below that is highlighted in bold text—in this case a CAP customer who chose vanpooling):

1. If the answer to Question 6 is not 1, 2, or 3, then the total vehicle trips reduced is zero. Go on to the next survey.

Answer is 2 - continue
2. Calculate the total trips reduced by carpooling after using the agency by calculating the following:

\[
(Question \ 9 + \ Question \ 13) \times (Question \ 10 + \ Question \ 14 - 1) / \\
(Question \ 10 + \ Question \ 14) \times (Question \ 11 + \ Question \ 12) \\
2 \text{ trips/day} \times 49 \text{ weeks/year} \\
\]

\[
(0 \text{ days/week} + 0 \text{ days/week}) \times (0 \text{ trips/day} + 0 \text{ trips/day} - 1) / \\
(0 \text{ trips/day} + 0 \text{ trips/day}) \times (0 \text{ months} + 0 \text{ months} = 0 \text{ years}) \\
2 \text{ trips/day} \times 49 \text{ weeks/year} = 0 \\
\]

Questions 11 and 12 should be converted into years, UP TO 1 YEAR MAXIMUM, by dividing days by 245, weeks by 49, and months by 12. Since this is an annual measurement, IN NO CASE should the sum of Questions 11 and 12 be greater than 1.

3. Calculate the total vehicle trips reduced by vanpooling after using the agency by calculating the following:

\[
(Question \ 17 + \ Question \ 21) \times (Question \ 18 + \ Question \ 22 - 1) / \\
(Question \ 18 + \ Question \ 22) \times (Question \ 19 + \ Question \ 20) \\
2 \text{ trips/day} \times 49 \text{ weeks/year} \\
\]

\[
(5 \text{ days/week} + 0 \text{ days/week}) \times (8 \text{ trips/day} + 0 \text{ trips/day} - 1 \text{ trip/day}) / \\
(8 \text{ trips/day} + 0 \text{ trips/day}) \times (8 \text{ months} = .67 \text{ years}) \\
2 \text{ trips/day} \times 49 \text{ weeks/year} = \\
(35 / 8 \text{ days/week} \times .67 \text{ years} \times 2 \text{ trips/day} \times 49 \text{ weeks / year}) = 287.3 \text{ trips} \\
\]

Questions 19 and 20 should be converted into years, UP TO 1 YEAR MAXIMUM, by dividing days by 245, weeks by 49, and months by 12. Since this is an annual measurement, IN NO CASE should the sum of Questions 19 and 20 be greater than 1.

4. Calculate the total vehicle trips reduced through transit use after contacting the agency by calculating the following:

\[
(Question \ 25 + \ Question \ 28) \times (Question \ 26 + \ Question \ 27) \\
2 \text{ trips/day} \times 49 \text{ weeks/year} \\
\]

\[
(0 \text{ days/week} + 0 \text{ days/week}) \times (0 \text{ months} + 0 \text{ months}) \\
2 \text{ trips/day} \times 49 \text{ weeks/year} = 0 \text{ trips} \\
\]

8
Questions 26 and 27 should be converted into years, UP TO 1 YEAR MAXIMUM, by dividing days by 245, weeks by 49, and months by 12. Since this is an annual measurement, IN NO CASE should the sum of Questions 26 and 27 be greater than 1.

5. Calculate the total vehicle trips reduced through increase in other means by calculating the following:

\[(\text{Question 32} + \text{Question 35}) \times (\text{Question 33} + \text{Question 34})\]

\[(0 \text{ days/week} + 0 \text{ days/week}) \times (0 \text{ months} + 0 \text{ months}) \times 2 \text{ trips/day} \times 49 \text{ weeks/year} = 0 \text{ trips}\]

Questions 33 and 34 should be converted into years, UP TO 1 YEAR MAXIMUM, by dividing days by 245, weeks by 49, and months by 12. Since this is an annual measurement, IN NO CASE should the sum of Questions 33 and 34 be greater than 1.

6. Sum the results of Steps 3 through 5 to determine the total number of trips reduced after contact with the agency.

\[\text{Sum} = 287.3 \text{ trips}\]

To calculate the trips reduced for the entire database:

7. Calculate:

\[(\text{Sum of the vehicle trips reduced for all the surveys}) \times (\text{size of rideshare database} / \text{number of surveys completed with members of the rideshare database})\]

RP5 Vehicle miles eliminated

This performance measure is calculated by using follow-up survey data. To calculate, complete the following steps (refer to Appendix B for the sample completed survey that was used to develop the example):

1. Determine the vehicle trips reduced for each survey as described above. (remember that this should be 0 if the answer to Question 6 is not 1, 2, or 3)

\[\text{Answer is 2 - continue}\]
2. Multiply the result from Step 1 by Question 2 for each survey.

287.3 trips * 10 miles = 2873 miles

To calculate VMT reduced for the entire database:

3. Calculate:
   (Sum of the vehicle miles reduced for all the surveys) * (size of rideshare database / number of surveys completed with members of the rideshare database).

**RP6 Employer contacts**

Report number of employer contacts by the following categories:
- Number contacted by letter/fax
- Number contacted by phone
- Number contacted in person
- Number of follow-up calls or visits

When reporting include the number of employees at each site. These figures will be tracked and collected by the CAP staff.

**RP7 Major accomplishments**

This performance measure is a listing of all major CAP programs and/or initiatives and the accomplishments of these projects/initiatives. These may include:
- New Transit Services Initiated/Improved
- Educational Program Initiated
- Transportation Planning Initiatives
- Guaranteed Ride Home Projects Initiated
- Other Implementation Activities

This information would be tracked and collected by CAP staff.

**RP8 Parking spots saved/parking needs reduced**

This is a performance measure that is calculated by determining the number of people using alternative modes at each employment site. It can also be calculated by taking the number of vehicle trips reduced from a database survey and dividing by 2 trips per day/245 working days per year.

**RP9 Commuter costs saved**

This performance measure is calculated by multiplying vehicle miles eliminated by the average cost per mile, (AAA uses $.448 per mile, the federal government and State of Florida use $.29 per mile).
SECTION B - DISTRICT OPTIONAL PERFORMANCE MEASURES

The FDOT defined District optional performance measures are:

1. Gasoline saved
2. Emissions reduced
3. Information materials distributed
4. Special events
5. Media/community relations

The following tables have been developed to assist the Commuter Assistance Agencies in Florida track their performance relative to FDOT District optional performance measures. The tables are constructed with five supporting columns to help the CAP collect, analyze, and disseminate the results of the performance measures. The first column describes actions that the CAP agencies take to achieve program goals, or potential activities that could be incorporated to achieve the goal. The second column includes the performance measures that are required by FDOT. The third column is used if benchmarks or actual results are available for each performance measure. These benchmarks/results could be taken from survey responses, from past commuter assistance program evaluation reports, or from data available from other similar CAP programs. The fourth column lists the source for evaluating achievement of the performance measure (i.e. database survey). The fifth column can be used by the commuter assistance program to select targets to achieve for each of the performance measures. The sixth column can be used by CAP staff to explain why the selected targets have been set.

Following each of the tables, a brief description of each performance measure is included along with the method to be used to collect the necessary information. Where appropriate, the formula for calculating the performance measure is included.

Because some of the required performance measures require the CAP to survey their database, a sample survey has been included as Appendix A. This survey provides the basic framework needed to collect all necessary information. The CAP can use this survey, develop one on their own, or use this one as a basis for a more comprehensive survey instrument. Appendix B provides a sample completed survey to show how one database member may answer the survey questions. For assistance in developing surveys, contact the TDM Clearinghouse at the Center for Urban Transportation Research.
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<thead>
<tr>
<th>Action</th>
<th>Performance Measures</th>
<th>Benchmark/Results</th>
<th>Source</th>
<th>Targets</th>
<th>Contributing Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>OA1.1</td>
<td>OP1 Gasoline Saved</td>
<td></td>
<td>Survey data calculation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OP2 Emissions Reduction</td>
<td></td>
<td>Survey data calculation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OA1.2</td>
<td>OP3 Information Materials Distributed</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OP4 Special Events</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OP5 Media/Community Relations</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Definitions of District Optional Evaluation Measures

OP1  Gasoline saved

This performance measure is calculated by multiplying vehicle miles eliminated by the average miles per gallon figure from AAA. For the 1996 model year, average MPG was 20.3.

OP2  Emissions reduction

This performance measure is calculated by multiplying vehicle miles eliminated by the emission factors for the CAP service area. Emission factors are available from Department of Environmental Regulation and are available for ozone, carbon monoxide (CO), and nitrogen oxide (NOx). For 1996 the average passenger car emitted:
* 4.7 grams/mile of Ozone
* 23 grams/mile of CO
* 1.6 grams/mile of NOx

OP3  Information materials distributed

This performance measure details the number and type of informational materials distributed by the CAP. Informational materials may include but are not limited to:
   - Brochures
   - Information packets
   - Posters
   - Surveys
This information would be tracked and reported by the CAP staff.

OP4  Special events

This performance measure reports the number and type of special events conducted by the CAP staff to promote and/or encourage commute alternative use. Special events may include but are not limited to:
   - Transportation Days
   - Commuter Fairs
   - Special Promotions
This information would be collected and tracked by CAP staff.

OP5  Media/community relations

This performance measure tracks CAP staff efforts in informing the media and general public about CAP activities and programs. Categories may include but are not limited to:
   - Number of PSAs aired
   - Number of newspaper articles
Number of news stories
Number of magazine articles

This information would be tracked and reported by CAP staff.
SECTION C - OTHER PERFORMANCE MEASURES

The performance measures in this section have been developed to allow a CAP the flexibility to tailor an evaluation program that closely matches program goals and objectives. They have also been developed to measure CAP effects on markets and groups, like employers and the general public, that directly or indirectly are influenced by CAP efforts. The performance measures can be used to develop a more complete profile of direct and indirect effects of CAP program activities on commuter mode choice. For example, the performance measures in this section can be used to determine if advertising campaigns influenced members of the general public to try carpooling without ever contacting the CAP office for assistance. To assist the CAP in selecting appropriate measures from this section, some of the FDOT required and optional performance measures have been repeated under appropriate goals. This provides the CAP with a mechanism to find some performance measures that can help develop a complete picture of CAP efforts.

The following tables have been developed to assist the Commuter Assistance Agencies in Florida track their performance relative to their own stated goals or to regional transportation goals. The tables are constructed by using a potential generic CAP or regional transportation goal as the major section heading with five supporting columns to help achieve the goal. The first column describes actions that the CAP agencies take to achieve the goal, or potential activities that could be incorporated to achieve the goal. The second column includes performance measures that can be used to track how well the agencies are doing in achieving the goal. The third column is used if benchmarks or actual results are available for each performance measure. These benchmarks could be taken from survey responses, from past commuter assistance program evaluation reports, or from data available from other similar CAP programs. The fourth column lists the source for evaluating achievement of the performance measure (i.e. database survey). The fifth column can be used by the commuter assistance program to select targets to achieve for each of the performance measures. The sixth column can be used by CAP staff to explain why the selected targets have been set.

Following each of the goal tables, a brief description of each performance measure is included along with the method to be used to collect the necessary information. Where appropriate, the formula for calculating the performance measure is included.
<table>
<thead>
<tr>
<th>Action</th>
<th>Performance Measures</th>
<th>Benchmark/Results</th>
<th>Source</th>
<th>Targets</th>
<th>Contributing Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1.1 Develop coordinated, consistent marketing program.</td>
<td>P1.1 % awareness of Commuter Assistance among employers</td>
<td>(at all aware) (highly aware)</td>
<td>Business survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1.2 Develop employer outreach marketing materials on TDM strategies.</td>
<td>P1.2 Number of first presentations made to employers</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1.3 Plan and conduct kick-off events with employers.</td>
<td>P1.3 Number of follow-up presentation made to employers</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1.4 Provide technical assistance in establishing employer programs.</td>
<td>P1.4 % of employers with TDM programs</td>
<td></td>
<td>Business survey</td>
<td></td>
<td></td>
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<tr>
<td>A1.5 Establish employer outreach campaign to appoint Employee Transportation Coordinated (ETCs) to involve employers in mobility programs.</td>
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<td>A1.6 Host ETC training program.</td>
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<tr>
<td>Action</td>
<td>Performance Measures</td>
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<td>Contributing Factors</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>A1.7 Develop coordinated, consistent marketing program.</td>
<td>P1.5 % aided awareness of CAP or RS number among commuters</td>
<td></td>
<td>General public survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1.8 Develop media campaign.</td>
<td></td>
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</tr>
<tr>
<td>A1.10 Conduct media campaign to increase customer inquiry and awareness.</td>
<td>P1.6 Number of customer inquiries</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 1.11 Evaluate outreach efforts.</td>
<td>P1.7 % awareness of CAP promotional messages</td>
<td></td>
<td>General public survey</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Definitions of Performance Measures for Goal One

P1.1 % awareness among employers

A measure taken from a business survey that asks if businesses are aware of the commuter assistance program.

P1.2 Number of first presentations made to employers

This is a measure that examines how many presentations were made about rideshare services to area employers. This measure represents initial presentations to employers who have shown an interest in commuter assistance program services. This data would be collected through quarterly reports and year-end evaluation reports made.

P1.3 Number of follow-up presentations made to employers

This is an required measure that examines the number of second, third and fourth presentations made to businesses in the CAP service area. This data would be collected from quarterly reports and evaluation reports submitted.

P1.4 % employers with TDM programs

This performance measure represents those employers who have designated an employee transportation coordinator or offer one of the following: compressed work weeks, work at home options, preferential parking, parking shuttles, guaranteed ride home programs, or bus or pool subsidies. Data for this measure would come from a business survey.

P1.5 % aided awareness of Commuter Assistance or Commuter Assistance Number among commuters

This measure examines commuter awareness of the CAP agency and/or the recognition of the telephone number commuters can call to receive assistance. This measure would be collected from the results of the general public survey.

P1.6 Number of customer inquiries

The number of customers who contacted the commuter assistance program during the review period. This measure would be tracked internally by the CAP.

P1.7 % awareness of CAP promotional materials

This measure examines the general public's awareness of any CAP promotional materials including highway signs, TV and radio ads, etc. This measure would be collected through the general public survey.
### Goal 2 - Increase productivity of roadway system

<table>
<thead>
<tr>
<th>Action</th>
<th>Performance Measures</th>
<th>Benchmark/Results</th>
<th>Source</th>
<th>Targets</th>
<th>Contributing Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 2.1  Attend and participate in MPO meetings to provide input and guide CAP activities.</td>
<td>P 2.1 % of TIP projects related to TDM</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A2.2  Develop long range vision, goals and objectives for CAP that are consistent with area-wide transportation network goals and programs.</td>
<td>P2.2 % of TIP budget spent on TDM related projects</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A2.3  Target MPO selected corridors and roadways for intensive rideshare marketing programs.</td>
<td>P2.3 % increase in average vehicle occupancy</td>
<td>Current AVO: Gen. Publ. Database</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P2.4 % reduction in vehicle miles of travel from 100% SOV among: 1. Database members 2. General public</td>
<td></td>
<td>Surveys</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P2.5 % reduction in vehicle trips from 100% SOV among: 1. Database members 2. General public</td>
<td></td>
<td>Surveys</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Definitions of Performance Measures for Goal Two

P2.1 % of TIP projects related to TDM

This measure would be calculated by CAP agencies based upon the number of Transportation Improvement Program (TIP) projects related to TDM in local plans vs. the total number of TIP projects.

P2.2 % of TIP budget spent on TDM related projects

This measure would be calculated by local rideshare agencies based upon the total value of TDM related TIP projects vs. total value of all TIP projects.

P2.3 % increase in average vehicle occupancy

This measure would examine the increase in vehicle occupancy from one evaluation period to the next. In the table, the baseline figure will be used to help the commuter assistance program calculate the percent change. The measure would be taken from a general public survey and database survey.

P2.4 % reduction in vehicle miles of travel

This measures the percent difference between actual VMT and VMT that would occur if all commuters used an SOV for work trips. The calculation would be done once for database members and once for the general public. To calculate:

\[
\frac{(\text{total trips in alternative mode per week}) \times (\text{duration of alternative mode use}) \times (\text{passengers-1/passengers}) \times (49 \text{ weeks per year}) \times (\text{miles per trip})}{(\text{total trips per week}) \times (49 \text{ weeks per year}) \times (\text{miles per trip})}
\]

P2.5 % reduction in vehicle trips

This performance measure would be calculated by taking the total number of trips taken versus the total number of trips that would have been taken assuming all alternative mode users formerly drove alone. The percent reduction figure is derived from a database member survey and the general public survey. To calculate:

\[
\frac{(\text{total trips in alternative mode per week}) \times (\text{duration of alternative mode use}) \times (\text{passengers-1/passengers}) \times (49 \text{ weeks per year})}{(\text{total trips per week}) \times (49 \text{ weeks per year})}
\]
<table>
<thead>
<tr>
<th>Action</th>
<th>Performance Measures</th>
<th>Benchmark/Results</th>
<th>Source</th>
<th>Targets</th>
<th>Contributing Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>A3.1 Decrease the number of at activity centers/along corridors</td>
<td>P3.1 % of work trips using alternative mode among: 1. Database members 2. Commuters</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>A3.2 Increase the use of commute alternatives among commuters at activity centers/along target corridors</td>
<td>P3.2 Number of peak period vehicles per 100 employees</td>
<td></td>
<td>Business surveys</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P3.3 VMT reduced for: General public Database members</td>
<td></td>
<td>Surveys</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>P3.4 Vehicle trips reduced for: General public Database members</td>
<td></td>
<td>Surveys</td>
<td></td>
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</tr>
<tr>
<td>Action</td>
<td>Performance Measures</td>
<td>Benchmark/Results</td>
<td>Source</td>
<td>Targets</td>
<td>Contributing Factors</td>
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</tr>
<tr>
<td>A3.3 Develop information on compressed work weeks and flexible work hour programs.</td>
<td>P3.5% employers with compressed work week programs among: 1. All employers 2. Targeted employers</td>
<td></td>
<td>Business</td>
<td>Surveys</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P3.6% employees working a compressed work week among: 1. All employers 2. Targeted employers</td>
<td></td>
<td>Business</td>
<td>Surveys</td>
<td></td>
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<tr>
<td></td>
<td>P3.7% employers with flextime programs among: 1. All employers 2. Targeted employers</td>
<td></td>
<td>Business</td>
<td>Surveys</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P3.8% employees working a flexible work schedule among: 1. All employers 2. Targeted employers</td>
<td></td>
<td>Business</td>
<td>Surveys</td>
<td></td>
</tr>
</tbody>
</table>
Definitions of Performance Measures for Goal Three

P3.1 % of work trips using alternative mode

This performance measure would be calculated by taking the total number of trips made by alternative modes (carpool, vanpool, transit, walk, and bike) and dividing by the total number of trips. The figure would be calculated for both database members and from surveys of the general public.

P3.2 Number of peak period vehicles per 100 employees

This measure can be calculated by CAP agencies by dividing the average vehicle occupancy at a worksite by 100. This measure should be used wherever the commuter assistance program is conducting an employer-based campaign.

P3.3 VMT reduced

This is a performance measure taken from both a general public survey and database member survey. It is calculated by taking the VMT reduced per commuter and multiplying by the number of commuters. The formula for calculating this measure is given under the Definitions of Required Performance Measures section beginning on Page Seven.

P3.4 Vehicle trips reduced

This is a performance measure taken from both a rideshare database member survey and a general public survey. It is calculated by taking the vehicle trips reduced per commuter (respondent) and multiplying by the number of commuters. The formula for calculating this measure is given under the Definitions of Required Performance Measures section beginning on Page Seven.

P3.4 % employers with compressed work week programs

The percentage of businesses offering a compressed work week schedule as determined by a business survey. Included would be figures for all surveyed employers and those targeted by the CAP. Importance would be determined by CAP focus. In other words, does the CAP provide technical assistance to specific employers, or simply market the concept.

P3.5 % of employees working a compressed work week schedule

A performance measure taken from a business survey, the figure reported represents the % of employees actually participating in a compressed work week program, as reported by the employer. Included would be figures for all employees and for those specifically targeted by the CAP.
P3.6 % employers with flextime programs

The percentage of businesses offering a flextime schedule as reported in a business survey. Included would be figures for all employers and those targeted by the CAP.

P3.7 % of employees working a flextime schedule

A performance measure from a business survey, the figure reported by employers would represents the % of employees actually participating in a flextime program. Included would be figures for all employees and for those who work at targeted employers.
<table>
<thead>
<tr>
<th>Action</th>
<th>Performance Measures</th>
<th>Benchmark/Results</th>
<th>Source</th>
<th>Targets</th>
<th>Contributing Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>A4.1 Form carpools.</td>
<td>P4.1 Tons carbon monoxide reduced</td>
<td></td>
<td>Database survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A4.2 Increase vanpools.</td>
<td>P4.2 Tons ozone pollutants reduced</td>
<td></td>
<td>Database survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A4.3 Increase transit use.</td>
<td>P4.3 Tons of nitrogen oxide reduced</td>
<td></td>
<td>Database survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A4.4 Increase non-motorized mode usage.</td>
<td>P4.4 Pollution reductions by mode</td>
<td></td>
<td>Database survey</td>
<td></td>
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<tr>
<td></td>
<td>Carpool</td>
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<td>Database survey</td>
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<tr>
<td></td>
<td>Vanpool</td>
<td></td>
<td>Database survey</td>
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<tr>
<td></td>
<td>Transit</td>
<td></td>
<td>Database survey</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Non-Motorized</td>
<td></td>
<td>Database survey</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Definitions of Performance Measures for Goal Four

P4.1 Tons of carbon monoxide reduced

Using the results of the VMT calculation, CO reduced is derived by:
(23 grams per mile) x (miles reduced per commuter) x (# of commuters/908,000 grams per ton).
This is an FDOT Optional Performance measure.

P4.2 Tons of ozone pollutants reduced

Using the results of the VMT calculation, ozone reductions are derived by:
(4.7 grams per mile) x (miles reduced per commuter) x (# of commuters/908,000 grams per ton).
This is an FDOT Optional Performance measure.

P4.3 Tons of nitrogen oxide reduced

Using the results of the VMT calculation, nitrogen oxide reductions are derived by:
(1.6 grams per mile) x (miles reduced per commuter) x (# of commuters/908,000 grams per ton).
This is an FDOT Optional Performance Measure.

P4.3 Pollution reductions by mode

Using the above calculations except that reductions are based on VMT reduced by mode.
<table>
<thead>
<tr>
<th>Action</th>
<th>Performance Measures</th>
<th>Benchmark/Results</th>
<th>Source</th>
<th>Targets</th>
<th>Contributing Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>A5.1 Develop materials on telecommuting.</td>
<td>P5.1 % employers with telecommuting program</td>
<td></td>
<td>Business survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A5.2 Hold a workshop with companies on telecommuting.</td>
<td>P5.2 % targeted employers with telecommuting program</td>
<td></td>
<td>Business survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A5.3 Promote alternative mode use.</td>
<td>P5.3 % employees in a telecommuting arrangement</td>
<td></td>
<td>Business survey</td>
<td></td>
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<tr>
<td></td>
<td>P5.4 % employees at targeted companies in a telecommuting arrangement</td>
<td></td>
<td>Business survey</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>P5.5 % reduction in vehicle miles of travel among: 1. Database members 2. General public</td>
<td></td>
<td>Surveys</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P5.6 Gallons of gasoline saved by alternate mode users among: 1. Database members 2. General public</td>
<td></td>
<td>Surveys</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Definitions of Performance Measure for Goal Five

P5.1 % employers with a telecommuting program

Taken from a business survey, the percentage of employers who offer a telecommuting option to its employees.

P5.2 % of targeted employers with a telecommuting program

Taken from a business survey, the percentage of businesses that work directly with the CAP or are located within a CAP-targeted activity center who offer a telecommuting option to some of its employees.

P5.3 % of employees in a telecommuting arrangement

Taken from a business survey, the % of employees who have taken a telecommuting option, as reported by employers.

P5.4 % of employees at targeted companies in a telecommuting arrangement

Taken from a business survey, the % of employees who work at targeted companies who have taken a telecommuting option, as reported by employers.

P5.5 % reduction in vehicle miles of travel

This measures the percent difference between actual VMT and VMT that would occur if all commuters used an SOV for work trips. The calculation is done once for database members and once for the general public.

P5.6 Gallons of gasoline saved by alternate mode users

Derived by taking the VMT reduction calculation and multiplying by the average miles per gallon figure for passenger vehicles as reported by the American Automobile Association (currently 20.3 mpg). The figure is derived for database members and for the general public from statistics taken from the database member and general public survey respectively. Gallons of gasoline saved by database members is an FDOT Optional Performance Measure.
## Goal 6 - Improve mobility - Carpools

<table>
<thead>
<tr>
<th>Action</th>
<th>Performance Measures</th>
<th>Benchmark/ Results</th>
<th>Source</th>
<th>Targets</th>
<th>Contributing Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 6.1 Seek to improve carpool matching program operated by CAP</td>
<td>P6.1 Number of persons registered</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A6.2 Customize brochure on options with survey form.</td>
<td>P6.2 Number of persons placed in carpools</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A6.3 Develop &quot;Guide on How to Form a Carpool.&quot;</td>
<td>P6.3 Duration of existing carpools</td>
<td></td>
<td>Database survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P6.4 % of trips done by carpool and vanpool</td>
<td></td>
<td>Database survey</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Definitions of Performance Measures for Goal Six - Carpools

P6.1 Number of persons registered

The total number of persons who are registered in the commuter assistance program database. This number will be developed by the commuter assistance agencies as part of their performance measures.

P6.2 Number of persons placed in carpools

The total number of persons placed into carpools. This would be collected and disseminated as part of the quarterly performance report.

P6.3 Duration of existing carpools

The average length of time that current poolers have been in their pooling arrangement. This figure is taken from a database members survey.

P6.4 % of trips done by carpool/vanpool

The percentage of all work trips done by carpool and vanpool. This figure is taken from a database member survey and/or a general public survey.
<table>
<thead>
<tr>
<th>Action</th>
<th>Performance Measures</th>
<th>Benchmark/Results</th>
<th>Source</th>
<th>Targets</th>
<th>Contributing Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>A6.4 Meet with representative of transit agencies to strengthen vanpool programs.</td>
<td>P6.5 Number of vanpools</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A6.5 Make arrangements to obtain vans through purchase or lease (e.g., VPSI).</td>
<td>P6.6 Number of vanpool riders</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A6.6 Develop fare structure, arrange for maintenance, prepare marketing materials, and introduce program.</td>
<td>P6.7 Number of vanpool presentations</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A6.7 Develop &quot;New Start&quot; assistance program to subsidize the cost of 4 empty seats for four months.</td>
<td>P6.8 Number of vans in service</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
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<tr>
<td>A6.8 Hold presentations with groups of employees who live over 20 miles away from work.</td>
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</tbody>
</table>
Definitions of Performance Measures for Goal Six - Vanpools

P6.5 Number of vanpools formed

For this performance measure, the CAP agencies would report the total number of vanpools formed during the review period.

P6.6 Number of vanpool riders

For this performance measure, the CAP agencies would report the total number of vanpoolers as part of their quarterly performance reports.

P6.7 Number of vanpool meetings

For this performance measure, the CAP agencies would report the total number of vanpool meetings held as part of their quarterly performance reports.

P6.8 Number of vans in service

This is an FDOT required performance measure. The CAP agencies would report the number of commuter vans on the road as part of their quarterly performance reports.
<table>
<thead>
<tr>
<th>Action</th>
<th>Performance Measures</th>
<th>Benchmark/Results</th>
<th>Source</th>
<th>Targets</th>
<th>Contributing Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>A6.9 Develop a program to encourage employers to offer incentives and support for bicycle and pedestrian programs.</td>
<td>P6.8 % employers with bike racks/lockers</td>
<td></td>
<td>Business survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A6.10 Meet with area bike coordinators and obtain marketing materials for distribution through employers.</td>
<td>P6.9 % employers w/shower/storage</td>
<td></td>
<td>Business survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A6.11 Meet with employers to discuss plans.</td>
<td>P6.10 % commuters who walk or bike to work</td>
<td></td>
<td>General public survey</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Definitions of Performance Measures for Goal Six - Non-motorized

P6.8  % employers with bike racks/lockers

This measure would be taken from a business survey. It represents the percentage of businesses that state that they have bike racks and/or lockers at the worksite.

P6.9  % employers with showers/storage facilities

This measure represents the percentage of employers who offer showers and storage facilities to their employees at the worksite. The figures would be taken from a business survey.

P6.10 % commuters who walk or bicycle to get to work

This measure would be taken from a general public survey and/or database survey. It is the percentage of commuters who use bicycles or walk to work.
<table>
<thead>
<tr>
<th>Action</th>
<th>Performance Measures</th>
<th>Benchmark/Results</th>
<th>Source</th>
<th>Targets</th>
<th>Contributing Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>A6.12 Increase the number of employers offering transit subsidies to employees.</td>
<td>P6.11 % employers purchasing transit passes</td>
<td></td>
<td>Business survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A6.13 Increase the number of employers selling transit passes to employees.</td>
<td>P6.12 Number of passes sold</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A6.14 Encourage/promote the use of Park n Ride lots as a pick-up/drop-off point for pools and/or accessing transit.</td>
<td>P6.13 % commuters purchasing transit passes</td>
<td></td>
<td>Surveys</td>
<td></td>
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<tr>
<td></td>
<td>P6.14 % employers with transit subsidy programs</td>
<td></td>
<td>Business survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P6.15 park n ride lot utilization rates</td>
<td></td>
<td>Collected by CAP or FDOT</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Definitions of Performance Measures for Goal Six - Transit

P6.11 % of employers selling transit passes

This is a potential question on future rideshare surveys conducted among area businesses. It represents the percentage of local employers that sell discount transit passes to their employees.

P6.12 Number of passes sold

The measure would track the number of discount transit passes sold on behalf of the local transit agencies by the CAP agencies.

P6.13 % of commuters purchasing transit passes

This is a potential performance measure that would be collected in a database member and general public survey. The measure would represent the percentage of survey respondents who purchase transit passes for commuting to work via mass transit vehicles.

P6.14 % of employers with transit subsidy programs

This is a performance measure taken from a survey of businesses. It would represent the percentage of local employers who indicated that they provided financial subsidies to employees traveling on transit vehicles.

P6.15 Park n ride lot utilization rates

This information is currently not tracked by CAP agencies. It represents the percentage of parking spaces being used at local park n ride facilities.
<table>
<thead>
<tr>
<th>Action</th>
<th>Performance Measures</th>
<th>Benchmark/Results</th>
<th>Source</th>
<th>Targets</th>
<th>Contributing Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>A7.1 Develop Commuter Assistance marketing campaign based on reduced costs</td>
<td>P7.1 Gasoline costs savings Database General Public</td>
<td></td>
<td></td>
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<td></td>
<td>P7.2 Auto maintenance savings Database General Public</td>
<td></td>
<td>Surveys</td>
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<tr>
<td></td>
<td>P7.3 Commuter costs saved</td>
<td></td>
<td></td>
<td>Survey data calculation</td>
<td></td>
</tr>
</tbody>
</table>
Definitions of Performance Measures for Goal Seven

P7.1 Gasoline costs savings

This performance measure estimates cost savings accrued from not having to purchase gasoline. It is calculated by taking the VMT reduction figure and multiplying by gallons used per mile by the average automobile and the cost per gallon of gasoline. \((VMT \times \text{gallons/mile} \times \text{cost/gallon})\). Average MPG for 1996 was 20.3, and cost per gallon figures are available from local AAA offices.

P7.2 Auto maintenance savings

For this performance measure, the savings are calculated by taking the VMT reduction figure and multiplying by the maintenance costs of an automobile/mile. \((VMT \times \text{maintenance cost/mile})\). Maintenance costs are included in the AAA cost per mile figure and generally are about 10-15 cents per mile.

P7.3 Commuter costs saved

This performance measure is calculated by multiplying vehicle miles eliminated by the average cost per mile to operate an automobile (AAA uses \$.448 per mile, the federal government and State of Florida use \$.29 per mile).
<table>
<thead>
<tr>
<th>Action</th>
<th>Performance Measures</th>
<th>Benchmark</th>
<th>Source</th>
<th>Targets</th>
<th>Significant Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>A8.1 Provide travel choices</td>
<td>P8.1 Number of parking spaces saved</td>
<td>Direct:</td>
<td>Database survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 8.2 Provide cost-effective services</td>
<td>P8.2 Cost per trip provided direct influence and total influence</td>
<td>Total:</td>
<td>Database survey</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Definitions of Performance Measures for Goal Eight

P8.1 Number of parking spaces saved

This is an FDOT required performance measure. It is calculated by taking the vehicle trips reduced figure from the database survey divided by 2 trips per day/245 working days.

P8.2 Cost per trip provided (direct and total)

This is a performance measure that is calculated by using the results of the database member survey. The information needed to calculate the cost per trip provided (direct) is:

1. Total carpool and vanpool trips provided per commuter- same measurer as trips reduced EXCEPT that the size of the pool is not taken into account.

2. Database size.

3. Influence rate per trip for carpool and vanpool- the number of poolers that say their mode choice was influenced by commuter assistance, weighted by the number of trips taken.

4. Annual budget- the budget of the commuter assistance program.

To calculate:

\[
\text{annual budget} \times \frac{\text{total carpool and vanpool trips provided per commuter}}{\text{database size}} \times \text{(influence rate)}
\]

Calculating the cost per trip provided (total) assumes that all database members that are in a pooling arrangement were, in some way, influenced by the commuter assistance program. The information needed to calculate the cost per trip provided (total) is:

1. Total carpool and vanpool trips provided per commuter- same measurer as trips reduced EXCEPT that the size of the pool is not taken into account.

2. Database size.

3. Annual budget- the budget of the Commuter Assistance Program.

To calculate:

\[
\text{annual budget} \times \frac{\text{total carpool and vanpool trips provided per commuter}}{\text{database size}}
\]
<table>
<thead>
<tr>
<th>Action</th>
<th>Performance Measures</th>
<th>Benchmark/Results</th>
<th>Source</th>
<th>Targets</th>
<th>Contributing Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>A9.1 Develop marketing campaign aimed at reducing costs/congestion</td>
<td>P9.1 Number of customer inquiries</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P9.2 Number of applications processed</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P9.3 % of employers wanting assistance from Commuter Assistance</td>
<td></td>
<td>Business survey</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Definitions of Performance Measures of Goal Nine

P9.1 Number of customer inquiries

The number of customers who contacted the commuter assistance program during the review period. This measure will be tracked internally by the CAP agencies.

P9.2 Number of applications processed

This is a performance measure, that represents the total number of applications received and processed by the CAP agencies during the review period.

P9.3 % of employers wanting assistance from Commuter Assistance

This is a performance measure taken from a business survey. It represents the percent of businesses responding that stated they would like to be contacted by a CAP agency about establishing an employer TDM program.
<table>
<thead>
<tr>
<th>Action</th>
<th>Performance Measures</th>
<th>Benchmark/Results</th>
<th>Source</th>
<th>Targets</th>
<th>Contributing Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>A10.1 Develop marketing campaign to encourage use of alternative modes</td>
<td>P10.1 % ever tried alternate mode</td>
<td>General public: Database:</td>
<td>Surveys</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P10.2 % of general public trying alternate mode based on advertising</td>
<td></td>
<td>General public survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P10.3 % of database trying alternative mode based on CAP info</td>
<td></td>
<td>Database survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P10.4 % of general public attempting to contact Commuter Assistance</td>
<td></td>
<td>General public survey</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Definitions of Performance Measures for Goal Ten

P10.1 % ever tried alternate mode

This performance measure would be taken from both a general public survey and a database member survey. It represents the percentage of respondents that said they tried using a commute alternative at some point in time to commute to and from work.

P10.2 % of general public trying alternate mode based on advertising

This performance measure is taken from the general public survey. It represents the percent of respondents who said that they tried a commute alternative after hearing/seeing commuter assistance program advertisements.

P10.3 % of database trying alternative mode based on Commuter Assistance info

This performance measure is taken from a database member survey. It represents the percentage of respondents who stated that they tried a commute alternative after obtaining information from the Commuter Assistance Program.

P10.4 % of general public attempting to contact Commuter Assistance

This performance measure would be taken from a general public survey. It represents the percent of respondents who stated that they had tried to contact the CAP agencies for information.
<table>
<thead>
<tr>
<th>Action</th>
<th>Performance Measures</th>
<th>Benchmark/Results</th>
<th>Source</th>
<th>Targets</th>
<th>Contributing Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>A11.1</td>
<td>P11.1 Number of zip code meetings held</td>
<td>Collected by CAP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A11.2 Make introductory calls to potential matched poolers.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P11.2 Number of introductory calls made</td>
<td>Collected by CAP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P11.3 % database receiving pooling tips</td>
<td>Database survey</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P11.4 % database receiving GRH info</td>
<td>Database survey</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P11.5 % database receiving matching info</td>
<td>Database survey</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P11.6 % database using matchlist to try and form a pool</td>
<td>Database survey</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P11.7 Satisfaction with Commuter Assistance among database members</td>
<td>Database survey</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P11.8 % database who would recommend Commuter Assistance to others</td>
<td>Database survey</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Definitions of Performance Measures for Goal Eleven

P11.1 Number of zip code meetings held

This performance measure would be tracked by the CAP. It represents the number of meetings held at employment sites to introduce matched employees residing in the same zip code.

P11.2 Number of introductory calls made

This performance measure represents the efforts of the CAP agencies in making formation inquiry calls on behalf of database members that have been matched. This measure would be collected by the commuter assistance agencies.

P11.3 % database members receiving pooling tips

This measure would be taken from a database member survey. It represents the percent of respondents who stated they had received pooling tips from the commuter assistance program.

P11.4 % database members receiving GRH info

This measure would be taken from a database member survey. It represents the percent of respondents who stated they received guaranteed ride home program information from the CAP.

P11.5 % database members receiving matching info

This measure would be taken from a database member survey. It represents the percent of respondents who stated they had received matching information from the CAP.

P11.6 % of database using the matchlist to try and form a pool

This measure would be taken from a database member survey. It represents the percent of respondents who reported trying to make contacts with others on their matchlist to try and form a pool.

P11.7 Satisfaction with Commuter Assistance among database members

This is a performance measure representing the satisfaction database members have with services provided by the CAP agencies. Respondents would rate agencies on a 1 to 10 scale.

% of database members who would recommend Commuter Assistance to others

This is a performance measure that would be taken from the database member survey. It represents the percentage of database members who would definitely recommend commuter assistance to others.
<table>
<thead>
<tr>
<th>Action</th>
<th>Performance Measures</th>
<th>Benchmark/Results</th>
<th>Source</th>
<th>Targets</th>
<th>Contributing Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>A12.1 Provide GRH program.</td>
<td>P12.1 Number of GRH rides provided</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A12.2 Develop follow-up system.</td>
<td>P12.2 Number registered for GRH</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P12.3 % of database provided with GRH info</td>
<td></td>
<td>Database member survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P12.4 % of database members receiving follow-up contacts</td>
<td></td>
<td>Database member survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P12.5 % of employers providing incentives</td>
<td></td>
<td>Business survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P12.6 % employers providing GRH</td>
<td></td>
<td>Business survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P12.7 % of employers w/ETCs</td>
<td></td>
<td>Business survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P12.8 % 12 mo.+ database members using commute alternative</td>
<td></td>
<td>Database member survey</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Definitions of Performance Measures for Goal Twelve

P12.1 Number of GRH rides provided

This is a performance measure that would be tracked by the CAP agencies. It represents the total number of guaranteed ride home rides provided during the review period.

P12.2 Number registered for GRH

This is a performance measure that would be collected and tracked by the CAP agencies. It represents the total number of persons that have registered for the guaranteed ride home program.

P12.3 % of database provided with GRH info

This measure would be taken from a database survey. It represents the percent of respondents from the entire database that stated they had received guaranteed ride home program information.

P12.4 % of database members receiving follow-up contacts

This measure would be taken from a database member survey. It represents the percent of respondents who reported that they had been contacted by the commuter assistance program as a follow-up to materials that had been sent by commuter assistance.

P12.5 % of employers providing incentives

This performance measure would be taken from a business survey. It represents the percent of employers responding that they offered financial subsidies to employees who regularly used the transit system to commute to work.

P12.6 % of employers providing GRH

This is a performance measure taken from a business survey. It represents the percent of employers who reported offering their own guaranteed ride home program to their employees.

P12.7 % of employers w/ETCs

This is a performance measure taken from a business survey. It represents the percent of employers who reported designating their own employee transportation coordinator to assist their employees in finding commute alternatives.

P12.8 % 12 mo.+ database members using commute alternative

This is a performance measure taken from a database member survey. The measure represents the percent of database members whose entry date in the database is greater than 12 months and who report that they are still using a commute alternative.
<table>
<thead>
<tr>
<th>Action</th>
<th>Performance Measures</th>
<th>Benchmark/Results</th>
<th>Source</th>
<th>Targets</th>
<th>Contributing Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>A13.1 Develop system to track and resolve complaints.</td>
<td>P13.1 Number of complaints</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A13.2 Develop system to obtain Commuter Assistance service users terminals.</td>
<td>P13.2 Complaints resolved</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P13.3 Number of testimonials received</td>
<td></td>
<td>Collected by CAP</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P13.4 Employer effectiveness rating of Commuter Assistance</td>
<td></td>
<td>Business survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P13.5 Database member effectiveness rating for CAP</td>
<td></td>
<td>Database member survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P13.6 % of database members who would recommend Commuter Assistance To others</td>
<td></td>
<td>Database member survey</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Definitions of Performance Measure for Goal Thirteen

P13.1 Number of complaints

This is a potential performance measure for the CAP agencies. The CAP agencies would collect the number of complaints they received in regards to their services.

P13.2 Complaints resolved

This is a potential performance measure that would be collected and tracked by the CAP agencies. The measure would count the number of complaints resolved by the commuter assistance program to the customer's satisfaction.

P13.3 Number of testimonials received

This is a potential performance measure. The measure would be collected by the CAP agencies and would represent the number of testimonials and written recommendations made on behalf of the commuter assistance program.

P13.4 Employer effectiveness rating of commuter assistance

This is a performance measure taken from a business survey. It represents the rating given by employers on the effectiveness of services provided by the CAP agencies. The rating scale is from 1 to 10.

P13.5 Satisfaction with the commuter assistance program among database members

This is a performance measure taken from a database member survey. It represents the satisfaction rating given by respondents on the services provided by the CAP agencies. Respondents would be asked to rate the agencies on a scale of 1 to 10.

P13.6 % of database members who would recommend commuter assistance to others

This is a performance measure taken from a database member survey. It represents the percentage of database members who would definitely recommend the commuter assistance program services to others.
SECTION D-DETERMINING APPROPRIATE PERFORMANCE MEASURES

The CAP office should meet with their local FDOT District representative to select which performance measures will be used to evaluate the program. At a minimum, all required performance measures must be included. At CAP and/or FDOT option, performance measures taken from the optional performance measures section and from the other performance measures section may be included.

Selecting Performance Measures

When selecting performance measures, the CAP and FDOT District offices should consider:

* What performance measures can be used to monitor progress in achieving stated program goals and objectives?

* What performance measures can be used to improve program performance or customer service?

* What performance measures help highlight program accomplishments?

* What CAP programs are important and are not measured through the required performance measures?

* What new initiatives or programs have been added since the last evaluation that should be measured?

* Does the available evaluation budget allow us to conduct other surveys besides the database survey? (See Chapter Six of the CAP Evaluation Manual for budget considerations).

Assistance in selecting appropriate performance measures, and in developing survey questions to collect the data needed to assess performance is available from the TDM Clearinghouse located at the Center for Urban Transportation Research (CUTR) at the University of South Florida.

An example methodology for measuring overall program effectiveness and changes in productivity

One of the challenges in evaluating the performance of TDM programs across programs and over time is the diversity of goals and objectives as well as different emphasis areas.

The evaluation should help CAPs enhance their performance through focus on dual, results-oriented goals:
The selection of products and services, performance measures, and organizational structure usually depends upon many factors such as the service area, the CAP's stage of development, and employee capabilities. The CAP, in cooperation with their key stakeholders should select which objectives and performance measures best describe its mission and accomplishments.

A successful evaluation will use procedures that determine one or more of the following: (1) the extent to which the program has achieved its stated objectives (e.g., increases in Average Vehicle Occupancy); (2) the extent to which the accomplishment of the objectives can be attributed to the program (direct and indirect effects) (3) the degree of consistency of program implementation to plan (relationship of planned activities to actual activities), and, (4) the relationship of different tasks to the effectiveness of the program (productivity). The following CAP Productivity Index summarizes the CAP's operational performance.

Once the information is collected on performance, awareness and customer satisfaction, the next challenge is how to summarize these diverse factors to give an overall assessment of the program, track progress, and revise objectives.

Using the attached "Productivity Matrix" for the key performance measures or ratios, one can quantify the total impact of the performance measures. Referring to the attached table, the first shaded line would be the actual results of the CAP. The shaded blocks scattered below reflect nearly the same value. The range of values shown are for illustrative purposes only and should be established for each CAP. Level 0 represents the lowest value recorded for the criterion ratio over a recent period of time, in which normal operating conditions existed; nominally the worst ratio reading that might be expected. Level 3 represents operating results indicative of performance proficiency at the time the rating scale is established. The highest level, Level 10, is a realistic estimate of results that can be attained in the foreseeable future (e.g., 3 years) with essentially the same resources that are now available. This could be the benchmark of the industry's best.

By looking up the corresponding "Performance Score" on a scale of 0 to 10 to the right, the CAP can gauge how well the program is doing on that factor. Each score is noted in the shaded line near the bottom of the table. By assigning weights to each factor, the program can recognize those items thought to contribute most to the CAPs individual program. These weights might be determined by the CAP and/or FDOT.

The total "Performance Indicator" score reflects the combined, weighted score of each factor. Changes in this score from period to period will recognize changes in productivity.
### PRODUCTIVITY MATRIX
(Example only)

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Quantity (# Veh. Trips Reduced)</th>
<th>Quantity (# Vans in Service)</th>
<th>Quality (Customer Satisfaction Rating)</th>
<th>Awareness</th>
<th>Number of ETCs</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CURRENT VALUE</strong></td>
<td>55,232 per yr</td>
<td>6 vans</td>
<td>82% somewhat to very satisfied</td>
<td>50% heard of CAP</td>
<td>32 ETCs</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>80,000</td>
<td>20</td>
<td>100%</td>
<td>95%</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>75,000</td>
<td>18</td>
<td>97%</td>
<td>90%</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>70,000</td>
<td>16</td>
<td>94%</td>
<td>85%</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>65,000</td>
<td>14</td>
<td>91%</td>
<td>80%</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>60,000</td>
<td>12</td>
<td>88%</td>
<td>75%</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td><strong>55,000</strong></td>
<td>10</td>
<td>85%</td>
<td>70%</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>50,000</td>
<td>8</td>
<td><strong>82%</strong></td>
<td>65%</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>45,000</td>
<td>6</td>
<td>79%</td>
<td>60%</td>
<td><strong>30</strong></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>40,000</td>
<td>4</td>
<td>76%</td>
<td>55%</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>35,000</td>
<td>2</td>
<td>73%</td>
<td><strong>50%</strong></td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>30,000</td>
<td>0</td>
<td>70%</td>
<td>45%</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td><strong>SCORE:</strong></td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>20%</td>
<td>10%</td>
<td>30%</td>
<td>10%</td>
<td>30%</td>
<td><strong>100%</strong></td>
</tr>
<tr>
<td><strong>Weighted Score</strong></td>
<td>1</td>
<td>0.3</td>
<td>1.2</td>
<td>0.1</td>
<td>0.9</td>
<td><strong>3.5</strong></td>
</tr>
<tr>
<td><strong>Change in Productivity</strong> ((Total weighted score/3)-1) * 100% =</td>
<td>1.17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
INTRODUCTION

In order to conduct an effective evaluation, it is necessary to understand what the evaluation is supposed to accomplish. A useful typology of evaluations has been drawn from The Evaluator's Handbook published by the Center for the Study of Evaluation at UCLA.

TYPES OF EVALUATION

Three basic types of evaluation exist:

Needs Assessment
Summative Evaluation
Formative (Process) Evaluation

Each of these evaluations uses different types of evaluation tools, including planning or goal-setting meetings, examination of existing data or performance measures, and market surveys. The implementation of each of these tools is described later in the CAP Evaluation manual. The three types of evaluations are described in detail below:

Needs Assessment

A Needs Assessment is conducted when the program being evaluated is attempting to determine its goals and objectives. At some point in the organization's life, preferably close to the beginning, organizational goals and objectives must be set. The market that the organization is going to serve and the needs of that market that will be filled by the organization must be clearly identified. Needs Assessments are also called for when the organization perceives that significant change is taking place in its market, either due to new technologies, new patterns of behavior, or other major changes that impact the organization, the way it does business, or the needs that the organization is attempting to meet.

Needs assessments typically use one or more of the following evaluation tools:

- Surveys to profile the market, including:
  a) Quantifiable (usually telephone, mail, or panel) surveys to determine size, needs, and to identify and profile the market segments for targeting
  b) Focus groups to better understand the specific needs being served
- Overview of the organization's current capabilities - if applicable (i.e. if the needs assessment is occurring after the organization exists rather than as an initial step in the development of the organization)
- Identification/flowcharting of the organization's current processes - if applicable
- Strategic Planning sessions with upper management
Summative Evaluation

A “Summative” evaluation is one in which the effectiveness of the organization is examined in relation to its goals and objectives. Has the organization met its goals? Is it worth the money that is being spent on it? How well are organizational processes performing? Many elements are used in these types of evaluations: financial records, records of sales or transactions, (in the case of CAPS, records of matches requested and performed, growth of the matchlist database, etc.), examination of performance measures data, and survey research on the market served - often including customer satisfaction surveys. The intent of a summative evaluation is essentially to grade the performance of an organization.

Summative evaluations typically use one or more the following evaluation tools:
- Surveys of the served market, including:
  a) Quantifiable (usually telephone, mail, or panel) surveys to determine impact of the organization on market's behaviors (use of carpools, etc.) and/or to determine organization's customer's satisfaction levels.
  b) Focus groups to better understand the specific problems customers have with the organization - usually done after a quantifiable study
- Examination of organizational data - (i.e. accounting, marketing, and other performance)

Formative or Process Evaluation

A Formative Evaluation differs from a Summative Evaluation in that its purpose is to analyze organizational processes and suggest improvements to those processes to better serve the organization's goals - as opposed to merely grading their current effectiveness. The purpose of these evaluations is not so much to find new directions or objectives for the organization to meet as to fine-tune the method currently used in meeting objectives. If there is reasonable doubt that the processes are even coming close to meeting objectives, a summative evaluation of those processes (with the purpose of determining whether or not to continue the activity) may be called for. If there is reasonable doubt that the goals which the process is designed to meet are appropriate, a needs assessment may be called for.

One purpose of conducting a formative evaluation would be to examine the organization's processes as whole. A second purpose might be to compare how processes are carried out in different parts of the organization, such as at different sites. It is not uncommon to discover that two commuter assistance programs operating under a single umbrella, theoretically with the same set of procedures and guidelines, have entirely different ways of handling their customers.

Formative evaluations typically use one or more the following evaluation tools:
- Surveys of the served market, including:
  a) Quantifiable (usually telephone or mail) surveys to determine customer satisfaction with processes, market behaviors and how processes can be better designed to mesh with those behaviors.
Focus groups/Personal interviews to better understand how customers use the organization's product or service and the specific needs being served
Flowcharting of the organization's current processes
Interviews with employees who carry out the organizational processes being evaluated

Multi-purpose evaluations

Many evaluations are conducted for multiple purposes, particularly for both summative and formative purposes. For instance, it is quite common for a survey of an organization's customers survey to contain elements that both grade the organization on its current performance (summative evaluation) and that inquire into customer opinions about how service can be improved, either implicitly (through customer grading of various organizational processes - low grades need improvement) or explicitly. This is an acceptable, and in many cases desirable, procedure as long as the elements of the evaluation that are being conducted for summative versus formative purposes are clearly delineated.

MARKET RESEARCH AND SURVEYING

This chapter will provide the reader with a brief background on market research and surveying techniques and practices, and how they can be integrated into effective evaluations. It is intended to familiarize the reader with the concepts, terms, and options available in the field of market and survey research. This chapter is intended to provide the reader with enough knowledge to manage and oversee survey research projects. However, just as a manual on TDM strategies would not in itself provide a reader with the knowledge to form and operate a Commuter Assistance Program, this chapter does not in itself provide the tools and knowledge necessary to conduct research projects entirely on one's own. Such abilities are gained with years of classroom instruction and field experience.

Purposes of doing market research surveys

Market research surveys are designed to answer questions about the attitudes and behaviors of a specific group of people (a “market”), and to provide quantitative estimates of the prevalence of such behaviors and attitudes in the subject population. Market research can be viewed primarily as a means of reducing uncertainty - going from an “guess based on my own experience” to an informed estimate based on interviewing a representative sample of the market in question. A research project can improve an estimate from “I’m pretty sure that somewhere between 20% and 50% of the population has ever actually tried carpooling” to “There is a 90% chance that somewhere between 25% and 30% of the population has ever actually tried carpooling.”

Surveys are a tremendous aid in conducting any of the three types of evaluations discussed earlier: Needs assessments, Summative evaluations, and formative evaluations. They provide greater understanding of how your customers use your products, what they think about them, and what other products or services they may want that you may be able to provide to them.
Market research projects generally take one of the following forms, described below:

- **Attribute Testing**, which determines what facets or characteristics of a product are service are more or less appealing to a target market. An example of this type of study could be a study on competing airlines: who has better seating, baggage handling, more courteous service, better on-time performance, better prices, etc.

- **Analysis of users**, which provides demographic/psychographic profiles of a target market, often also comparing those profiles to profiles of a different market or of an overall population. This type of study is often used to direct resources in media selection for advertising/promotional campaigns. An example of this type of study could be a comparison of the demographics of carpoolers versus people who drive alone to work.

- **Satisfaction surveys**, which gauge the level of satisfaction of product or service users, and often are also structured to suggest areas where improvement would be most beneficial. An evaluation of a CAP by its members will generally take this form. For that reason, this type of study will be discussed at length in this manual.

- **Studies of decision-making methods**, which investigate how members of a target market make decisions, including what factors are used to make decisions and their relative importance to a decision. An example would be a study of mode choice.

- **Market sizing and/or forecasting**, which attempts to estimate how many people in a target market make use of a product or service and how much of that product they use. An example of this type of study could be an attempt to estimate how a CAP’s activities translate into a reduction of Vehicle Miles Traveled.

Whatever the results or findings from a market research study, there are two things that market research never does.

- Research never makes a decision, it merely provides better information for you to make decisions
- Research never guarantees success, it merely reduces the amount of uncertainty in the information you have.

**Attribute Testing**

The purpose of attribute testing is usually to determine what types of characteristics a product or service should have, and the relative importance of allocating resources to the development, maintenance, or improvement of those characteristics. Respondents are typically asked to rank, rate, or otherwise compare various attributes as to their importance, desirability, value, and so forth. If a rating is used, it is often done on a numerical scale such as 1-5, 1-7, 1-10, etc.

Other types of studies attempt to determine how a product is perceived in terms of its attributes. One such approach, called Multi-Dimensional Scaling, has respondents rate competing products or services in terms of their similarity and then uses mathematical modeling to help identify what attributes of the products respondents are using to make their comparisons. For example, a survey might have a respondent rate mode choices in terms of their similarity (driving alone versus carpooling versus biking, etc.)
Other techniques have respondents rate each product on a series of attributes and create graphical comparisons of the products based on those ratings. For example, a survey might have respondents rate carpooling, riding the bus, etc., on convenience, cost, efficiency, and so forth.

These types of analyses are often useful in identifying and understand how consumers or potential consumers view competing alternatives, and how perceptions might need to be changed in order to create greater acceptance of a particular alternative.

*Analysis of Users*

This is a classical type of analysis that usually involves asking respondents about their habits, attitudes, and demographic characteristics (age, income, education, and so forth) and then creates profiles of different groups. Often this is done to identify what types of people are most likely to use a product. This then allows the researcher to try to market the product more actively to those types of people on the basis that it is more attractive to them, or conversely they may try to reposition the product and target it to the types of people who are not using it. It all depends on the purpose of the research and the objectives of the organization that is marketing the product.

*Customer Satisfaction studies*

As market growth began to level off and competition for the consumer dollar increased to fierce levels in the latter part of the 1980's and early '90's, Customer satisfaction studies grew rapidly in popularity, acceptance, and use. Companies focused more efforts on retaining existing customers as it was discovered that retention was nearly always more efficient and profitable than market expansion and stealing market share from competitors.

Satisfaction studies take on a variety of forms. One of the most common is to measure overall satisfaction with a product or service and also to measure satisfaction with a number of the product's components. For a consumer product such as toothpaste, this might include satisfaction with taste, cleaning ability, cavity prevention, and so forth. For a service, components might include reliability, courtesy of employees, timeliness, and value. Other types of studies measure satisfaction with a large number of different services provided by organizations.

In some cases, statistical models are built that determine the relationship of attribute ratings to overall satisfaction. This can show either what the most important determinants of satisfaction are, or alternatively what elements are most important in explaining the difference between satisfied and unsatisfied customers. The differences here are subtle but extremely important. For instance, in the case of airlines, the most important attribute in customer satisfaction may well be safety, but since airlines are generally safe (look at the number of accidents compared to, say, roadway accidents) perceptions of safety rarely determine whether or not a customer is satisfied. Other characteristics, such as on-time performance, courtesy of employees, and so forth, become more critical.
Studies of Decision-Making Methods

This is an area that has been heavily used in transportation research. A large number of studies have been done to discover the relative importance of various mode choice determinants (or travel characteristics), including in-vehicle and out-of-vehicle time by mode, perceived costs, parking availability, and so forth. One of the most common approaches is called Discrete Choice Analysis, which is used either with existing data on mode choices (such as census data), or with structured surveys that present respondents with hypothetical situations and ask them to choose a mode given the characteristics of each situation. From the mode chosen and the levels of the characteristics (high parking costs, low parking costs, short travel distance, long travel distance, and so on) the importance of each of the characteristics can be estimated.

Market Sizing and/or Forecasting

This is an extremely common application of survey research, used in many consumer goods and service industries. Respondents are asked to estimate how much of a product or service they use or would use. The sample is then weighted to replicate the make-up of the population in question, and average usage rates are calculated. Finally, these average usage rates are applied to the entire population to determine a total market size or market potential. An example of this type of application could be VMT reduced by getting people to carpool. The population would be surveyed as to their intent to carpool, given some incentives and/or activities that the CAP in the area might undertake. The percentage that would carpool is then reweighted to replicate the make-up of the entire population (if necessary - a well-designed random sampling procedure should just about perfectly replicate the population), and the percentage is then applied to the population size and known travel characteristics. From these calculations overall VMT reduced by forming carpools can be estimated.

This type of procedure has some major limitations. The estimation usually requires respondents to predict entire patterns of behavior of long periods of time, (as opposed to merely stating preference for one product or service over another, or committing to one-time “trial” of a product without long-term implications, which is the form most reliable product/service tests take. Sophisticated demand estimation techniques for products such as consumer goods often use either full-scale test markets or laboratory-based “shops” which allow for observation of behavior and a full representation of the entire choice experience. This type of approach is impossible to apply to carpooling estimation. Carpool estimation also have a relatively rare drawback in that carpooling is seen as a public boon and carpooling is considered socially responsible and desirable. Therefore, respondents are likely to respond that they will carpool when polled as part of a public inquiry, even though their actual behavior will often not follow suit.
Nonetheless, surveying is often the only way of producing a reliable estimate of potential commuting behavior changes. The limitations noted above should be considered when estimations and forecasting are undertaken, but it should also be kept in mind that an estimate with limitations is can be a valuable addition to subjective data and prior experience in other, possibly very different, areas.
TYPES OF SURVEYS

There are a number of different types of surveys, each of which have unique characteristics and limitations. The choice of survey method is dependent on the objectives involved in doing the project and budget available. The main types of surveys are:

- Focus Groups
- Written/Mail surveys
- Telephone Surveys
- Personal interviews
- Panels

A short discussion of each of the approaches follows:

Focus groups

Focus groups are an excellent alternative if only a very general feel of public interest or support for a particular subject is required, and the researcher wishes to determine which issues of great impact to the community will surface. Because of the small sample sizes involved, this process will not allow for a quantitative estimate of public support nor will it determine the relative importance of issues raised or topics discussed. Typically two to four focus groups will be held. Cost will vary from $3,000 to $6,000 per topic, depending on the number of focus groups held, complexity of questions, and other time-related factors.

Reports from focus groups may contain references such as “75 percent of the people in the group were in favor of...” This type of statement is very misleading, since it implies that the percentage can be applied to the general public. It is best to avoid using numerical results if at all possible in such reports, and to concentrate on the qualitative aspects of the results - issues raised and discussed, features of products or services that come up during the session, and so on.

Written/mail surveys

Written and mail surveys are usually the lowest cost alternative available for quantitative estimation. The surveys allow for a relatively large amount of data to be collected from each respondent. However, the format of the questions should be kept simple. Difficult, complex survey formats will usually cause frustration in respondents and low response rates, thereby comprising the sample and possibly rendering it unrepresentative of the population.

Also, written surveys are often subject to low response rates, further compromising project ability. Certain techniques (such as obtaining databases of names and addresses and including
incentives) can help to improve response rates at higher costs. Finally, written surveys usually take over a month to collect necessary data.

Costs will vary greatly depending on the level of project ability the researcher is attempting to obtain. To provide a single, reliable estimate for an area, a minimum sample size of 250-300 is recommended. In cases where an independent estimate is required for several segments of the population (such as geographic areas, income levels, etc.), required sample sizes can increase greatly. Usually if a “general idea” is required for sub-segments and an accurate estimate for the population as a whole, a sample size of 125-150 per segment is sufficient. The cost for this type of approach can vary from $5,000 to $10,000 and up, depending on sample size and type required.

**Telephone surveys**

Telephone surveys have the advantage of rapidly providing quantitative estimates. Telephone surveys also tend to have higher response rates than mail surveys, which increase their level of proper representation and project ability.

The major drawback of telephone surveying is the cost involved. Furthermore, the amount of data and complexity of responses that a respondent can provide is limited - ½ hour phone interviews are not recommended. Concepts presented need to be fairly simple and straightforward.

As with mail surveys, costs will vary greatly depending on the level of project ability the researcher is attempting to obtain. To provide a single, reliable estimate for an area, a minimum sample size of 250-300 is recommended. In cases where an independent estimate is required for several segments of the population (such as geographic areas, income levels, etc.), required sample sizes can increase greatly. Usually if a “general idea” is required for sub-segments and an accurate estimate for the population as a whole, a sample size of 125-150 per segment is sufficient.

The cost for this type of approach can vary from $7,500 to $25,000 and up, depending on sample size and type required and length of interview.

**Personal interviews**

Personal interviews are the best alternative when complicated survey formats are required and detailed information needs to be provided to respondents. This is the only alternative that would have any chance of providing an estimate of transit demand. However, even this approach would suffer from some of the limitations noted above.

Costs for this type of interview tend to be extremely high if a quantitative estimate is required, since the usual purpose of using this type of interview is to present fairly complex information to
potential respondents, and to be able to judge the nuances of response. This requires rather skilled (and relatively expensive) interviewers, and also often involves travel expenses. If the only intent of the personal interview is to be able to present information, a mail/phone approach can sometimes be used at lower cost.

Panels

Panels are used when the objective is to track behaviors and changes in behavior over an extended period of time. Panels also provide convenient samples for testing new ideas in product or service development. Classic examples of panel research include the Nielsen rating panels and the a national purchase panel run by the NPD group which tracks purchases of a large number of different consumer goods.

Panel research can be very expensive, particularly if the panel approach is used for a single product or service. Usually panels are most useful when a number of different product or service areas are being covered, as in the NPD panel.

A table summarizing each of these approaches follows:
<table>
<thead>
<tr>
<th></th>
<th><strong>FOCUS GROUPS</strong></th>
<th><strong>WRITTEN/MAIL SURVEYS</strong></th>
<th><strong>TELEPHONE SURVEYS</strong></th>
<th><strong>PERSONAL INTERVIEWS</strong></th>
<th><strong>PANELS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>8-10 people discuss topics of interest to client; Led by professional moderator</td>
<td>Pre-designed survey mailed out to respondents</td>
<td>Pre-designed survey conducted by professional telephone interview</td>
<td>Survey administered by individual professional interviewer</td>
<td>Group of respondents who report their behavior over time</td>
</tr>
<tr>
<td><strong>Applicable uses</strong></td>
<td>Issue generation; In-depth discussion on complex survey results</td>
<td>General surveying of population; Medium-long surveys; Simpler survey formats</td>
<td>General surveying of population; Short-medium length surveys; Moderately complicated surveys</td>
<td>Interviews with key individuals; Long-Very long surveys; complicated survey formats</td>
<td>Longitudinal studies of behavior and choices; generally standardized survey formats</td>
</tr>
<tr>
<td><strong>Costs</strong></td>
<td>Low/Moderate</td>
<td>Moderate</td>
<td>Moderate/High</td>
<td>Very High</td>
<td>Very High</td>
</tr>
<tr>
<td><strong>Usefulness for Projections/Trend Analysis</strong></td>
<td>Virtually None - not projectible at all</td>
<td>Only if adequate response rates are obtained</td>
<td>Good</td>
<td>Very Good if enough interviews are completed</td>
<td>Fair - Panel members must be representative</td>
</tr>
<tr>
<td><strong>Turnaround</strong></td>
<td>Very fast</td>
<td>Slow</td>
<td>Fast/Moderate</td>
<td>Moderate/Slow</td>
<td>Slow</td>
</tr>
<tr>
<td><strong>Strengths</strong></td>
<td>Gets at issues beneath the surface; Low cost; Fast turnaround</td>
<td>Large sample sizes can be obtained; Longer surveys possible</td>
<td>Reasonably representative; fairly good turnaround</td>
<td>Allows more flexibility in interview format, in-depth probing</td>
<td>Allows study of long-term changes in behavior</td>
</tr>
<tr>
<td><strong>Weaknesses</strong></td>
<td>Very dependent on having a good moderator; No project ability</td>
<td>Low Response rates/ Unrepresentative samples can occur; Slow turnaround</td>
<td>Higher costs; Surveys need to be kept fairly short and simple</td>
<td>Very high costs per completed survey; Slow turnaround</td>
<td>High cost; Slow turnaround; potential bias based on panel membership</td>
</tr>
<tr>
<td><strong>Typical single project cost for complete project (Design, Analysis, Report)</strong></td>
<td>$3,000 - $6,000, based on complexity of issues and number of groups</td>
<td>$5,000 - $10,000 and up, based on complexity of survey and number of respondents</td>
<td>$7,500 - $25,000 and up, based on complexity of survey and number of respondents</td>
<td>$15,000 - $75,000 and up, based on complexity of survey and number of respondents</td>
<td>Varies based on length of study and size of panel</td>
</tr>
</tbody>
</table>
ISSUES IN SAMPLING

Many of the issues involved in proper sampling have been touched on in the above sections. This section will deal with each of the issues in more depth. The question of sample sizes will be briefly introduced and will be covered in detail in the statistics section, which directly follows this section.

Certain key elements that must be included in any sampling plan:
- Definition of target population
- Issues in proper representation
  a) how to ensure proper representation
     * quotas & screeners
     * random selection
     * reweighting
  b) how to evaluate how well the sample represents the population
- Sampling efficiency
- Sample size
- Sample sources

Definition of target population

This issue has been touched on in the section on hypothesis generation. Usually, the hypotheses that are being tested will define the target population, at least in a broad sense. The key is to define the target population in such a way that each respondent provides meaningful information. Even if the hypotheses do make clear the population that will be surveyed, this item should be restated when the sampling plan is being developed, to ensure that there are no misunderstandings or misinterpretations.

Proper representation

Because most surveys are conducted on a sample of the population rather than the full population, it is vital that the sample selected properly represent the population.

Imagine, for instance, if a survey of potential carpoolers were only conducted among households that had three or more cars, rather than among a sample of the population that more closely represented the entire population. It is very probable that this sample would have very low intentions of carpooling, since car availability is a major factor in determining mode choice. This would lead the researchers to draw erroneous conclusions about the prospects of developing carpools among the population.
How does a researcher go about
- ensuring proper representation; and
- evaluating completed surveys to check for proper representation?

Ensuring proper representation

Ensuring proper representation can be done in several ways. The steps to be taken include:

1. Identify key variables to serve as indicators
2. Include measurements of those variables in the surveys
3. Devise a random selection process
4. In some cases, require that the sample meet quotas on indicator variables.
5. Weighting results

1. **Identifying key variables**- The researcher and the research sponsor should identify those variables that will most likely impact attitudes and behaviors being measured. This is done through a combination of historical data sources (if available) and using the expertise of the parties involved to determine the most important variables. Usually one checks on a limited set of variables, say five or six. These can typically include age, income, gender, presence of children, and so forth.

It is important that there be an independent source that measures those variables. Usually, when the entire population of an area is being surveyed, census data serves as a good check on major demographic variables. Breakdowns of census data or tables in the U. S. Statistical abstracts can also serve as good checks when segments of a population are being surveyed. When the target sample is from an extremely specific database (for instance, a ridesharing database), data must either be culled directly from the database or from historical surveys of that database, if available.

2. **Including measurements of the indicator variables**- Clearly, if a variable is to be used as an indicator of proper representation, that variable must be included somewhere in the data collection process. Standard demographics are typically part of any surveying effort, since demographics often impact attitudes and behaviors and are therefore extremely useful in extrapolating results gleaned from a survey to the entire population. Any other variables chosen as indicators, such as number of automobiles, type of housing, and so on, should have a specific question in the survey to collect that data item.

3. **Devise a random selection process**- The most common way of ensuring a representative sampling of any given target population is through a random sampling process. In telephone-based surveys, this is often accomplished through a technique known as random-digit-dialing. Commercial services will obtain a list of all working phone exchanges, devise a sample of random numbers fitting those exchanges, eliminate exchanges having a high incidence of business/government telephone numbers, and then use the resulting list as a basis for the sample. This type of list will be most effective if it is further randomized by placing the telephone
numbers in random order. Because of the relatively large number of unlisted telephone numbers, a random selection process from a published phone book can create bias by eliminating unlisted numbers (which often belong to people with higher incomes) from the sampling universe.

When sampling from databases is involved, there are several possible random selection procedures. Ideally, the sample will be totally random. The process involved in creating a totally random sample involves:

- determining the sample base necessary
- determining the ratio of sample needed to total database size
- using a random number generator to create numbers between 0 and 1, and applying those numbers to each database record, and
- selecting as sample all those whose assigned random number falls below the ratio of sample needed to database size.

A second, less ideal but more commonly used method, is to create an nth-record sample, where the ratio of database size to sample needed is determined, rounded down, and every nth record is selected, where n is equal to the ratio of database size to sample needed. This method is acceptable when the database is not organized with some sort of regular order bias (such as all database requests sorted by day of the week received).

It should be noted that sample base size, that is, the sample that is drawn to meet the needs of the survey, is usually much larger than the actual required sample size. The reason for this is that there are a large number of non-working phone numbers and/or bad addresses in databases, and that a large percentage of people may not respond to the surveys. A ratio of 10 for sample base to desired completed surveys is not uncommon.

4. Using quotas on indicator variables- Another way of essentially forcing a sample to be representative of the population is to set quotas on some or all indicator variables. This is often used in selecting samples for focus groups, and often used on variables such as male/female ratio and minimum age (often 18 or older) for telephone surveys. Using quotas requires that the indicator variables be identified up front in a portion of the survey called a screener. For instance, if a survey were to have quotas set on gender, age, income, and presence of children, where a certain distribution in each of those categories was required, those questions would be the first asked in the survey. Interviewing would take place for each category desired until the quota was filled, and then people meeting the filled-quota description would no longer be interviewed.

A modified form of this approach can be used in mail surveys, but only if many more returns are received than need to be used. The quota variables will be checked on the surveys as they are returned, and as each quota is filled, no more surveys fitting in to that quota will be used. Ideally, this would be done by waiting until a pre-set cutoff date was reached, processing all of the surveys received up to that date, and then randomly selecting surveys to be used for each quota. More commonly, however, quotas will be filled in the order in which the surveys are received. It
should be noted that this technique is not often used with mail surveys, except to eliminate returns that don’t fit the target population at all. Mail surveys more commonly use weighting techniques to adjust for sample returns, as described in the next section.

5. **Weighting survey results**—Survey results are commonly *weighted* so that indicator variables will match up with independent source data. For instance, if a survey returned has only a 15% distribution of respondents with 3 or more cars, and it is known that the target population has 25% (say, from census data), then the survey results can be mathematically re-weighted to match the 25% figure. When this is done, *all* of the responses from the 3+ car group are re-weighted, not just the indicator variables. All of their opinions and attitudes are made more prominent.

As an analogy, if you are seeking a medical opinion, and you get one from a doctor who got out of medical school last week and one from a doctor who has been in practice for 10 years, you could reasonably consider all of the statements made by the experienced doctor as being more important to your final decision, on the basis of his/her years of experience. The same principle applies in reweighting survey results.

A critical factor in weighting survey results is that you have sufficient sample size within the group you are reweighting, particularly if you are making their opinions more prominent. If you had 5 responses from people with 3 or more cars and were to weight them as importantly as 100 responses from other people, you run a severe risk of having unrepresentative results. Your confidence in the responses given by the group to be re-weighted should be fairly high. The section on sample size, as well as the section on statistics, will explain the concept of confidence in greater detail. As a rule of thumb, it is probably unwise to re-weight responses from a group with less than 75 respondents.

**Evaluating surveys for proper representation**

Once the data have been collected, you will have a distribution of responses on the indicator variables, such as percent male and female, percent in various income brackets, and so forth. In some cases, you may have an average (or mean) value as a check (such as mean number of vehicles, mean number of people per household, etc.). Typically, however, indicator variables are evaluated in the form of distributions.

Checking the responses for proper representation essentially involves making statistical tests on the distributions. This section will provide a very general outline of what you are looking for when conducting the tests. The mechanics of conducting the tests will be described in the statistics section.

Two types of tests are commonly conducted on distributions. These tests are a variation on the standard *t* test and what is called a chi-square test.
The first, in which you compare the percentage of people who fall in a certain category in the survey responses to the percentage that fall in that category in the independent sample (such as the census) is a variation on a standard statistical test called a t test. The t test is designed to be used to compare means. However, in this case, each category can be considered as a yes/no response (for example, if 25% have 3 or more cars, we can treat this as the response to the question “do you have 3 or more cars?” where 25% said yes and 75% said no), and can be essentially treated as a numerical response of 1 or 0. The proportion can then be compared either to historical data or census data, treated in the same fashion, through this test. The mechanics of the test are described in the statistics section.

The chi-square test examines the entire distribution of responses simultaneously, as opposed to comparing category-to-category, and gives back a result that indicates whether the distributions are (statistically) significantly different or not. Thus this test could be applied simultaneously to the percentage of people saying they had no cars, 1 car, 2 cars, and 3 or more cars, to determine if the entire distribution were different. Alternatively, it can applied in the same manner as described for the t test (as a series of yes/no responses), in which case the chi-square test is equivalent to the variation on the t test. Again, the notion of statistical significance will be dealt with in detail in the statistics section.

Means can also be compared to ensure representativeness, although this is done much more infrequently. The reason that distributions are used more often to check how whether a sample is representative is that data is the checks are usually done on demographics, which are more typically collected in categorical form rather than in exact numbers.

**Sampling efficiency**

Collecting data from respondents costs money, and the more data is collected, the more money it costs. Another major cost factor is inefficiency in sampling, where for example you set up quotas and then contact a large number of people who don’t fit in the quotas. It costs time and money just to check whether or not potential respondents fit into quotas. Usually, research dollars are tight, and it is more than worthwhile to do everything possible to ensure that the sample base is as efficient as possible.

Sampling efficiency can be achieved in many ways. Simple examples could be:

- If a sample of working commuters is desired, it would be wise not to send surveys (or make telephone calls) to communities that are largely populated by retirees.
- If a sample of people who live in, say, St. Petersburg, Florida is desired, all phone exchange known to be wholly in Clearwater (or Seminole, or Largo, etc.) should be eliminated.

Commercial databases sometimes contain demographic data that can be used. For instance, a survey of commuters drawn from a demographic database could be restricted to those aged 18-54, if age data is available on the database.
For efficiency purposes, if the data is not available in advance and a screener must be used, the screening section should clearly be the first part of the survey, so that non-qualifying respondents won’t be interviewed (and thus cost money), only to determine towards the end of the survey that they don’t qualify.

Sample sizes

The issue of how many returned surveys are required is fairly complex. Some fairly advanced statistics are involved. The key issue that the research sponsor needs to determine is the level of uncertainty that is acceptable in the results. As mentioned earlier, there is always a chance that the survey will not exactly represent the opinions of the population even if a completely correct random selection procedure is used. This was demonstrated with the example of the deck of cards, where we could randomly select 20 cards from the deck and had to estimate (from the cards we drew) what percentage of the cards in the deck were black and what percentage were red. It is conceivable that we would randomly select 20 red cards and no black ones.

Survey results are usually presented as a single, specific result, such as “25% of the population has 3 or more cars.” To be completely accurate, the result might be presented in the following way:

There is a 95% chance that the between 22% and 28% (25% +/- 3%) of the population has 3 or more cars. There is a 90% chance that between 23% and 27% (25% +/- 2%) of the population has 3 or more cars. There is an 80% chance that... and so on.

There are two elements involved in the uncertainty about survey results - one is a range of results that the “true” result falls in (known as the confidence interval), and the other is the percent chance that the result falls into that range (known as the confidence level). Given a certain sample size that is randomly selected from a population, for any given result - either a percentage or an average - a confidence level and confidence interval can be calculated. The level and the interval are interdependent; that is the size of the interval depends on the magnitude of the level. For any given result, there is an interval corresponding to an 80% confidence level, a different (and larger) interval corresponding to a 90% confidence level, a third (and still larger) interval corresponding to a 95% confidence level, and so forth.

One common misconception is that, in order to get a reliable sample, it is necessary to survey a certain percentage of the population. The fact of the matter is that confidence levels and intervals are can be calculated completely independently from the size of the total target population. Should you happen to survey a large percentage of a population (say, 10% or more), a factor can be applied that increases the level of confidence. But the basic calculation (presented in the section on statistics) provides a minimum level of confidence (and confidence interval) independent from the size of the total target population.
The notion of confidence intervals and levels also demonstrates why focus groups are not a reliable source of quantitative information such as percentages. Suppose there are 12 people in a focus group, and eight of them happen to agree on something. It is not uncommon for focus groups to report that “a large majority” or even “two-thirds” of the “market” agrees on something. Application of the confidence interval formula (which really shouldn’t be used for such small samples anyway) would show that the true result, at a 95% confidence level, was anywhere between 41% and 95% - which might not indicate a “large majority” or even a majority at all.

What the research sponsor needs to decide, for the key results coming from the survey, is what size of interval at what level are acceptable. Usually, the confidence level is determined first (e.g., “I want to be 90% confident that all the results...”), and then the acceptable interval is determined (“... are within 3 percentage points or less of the true values.”) This decision is then evaluated (using statistics to be presented in the statistics section) for a 50% result, and the desired sample size can then be determined. The nature of the confidence interval is that it is at its maximum size when a 50% results occurs.

Sample sources

There are a large number of potential sources to obtain sample addresses or telephone numbers, whose use depends on the objectives of the survey. These include:
- Databases of, for example, rideshare club members
- Commercially available databases drawn from magazine subscription lists, sweepstakes entries, telephone directories, etc. These databases can have a surprisingly large number of names matched to addresses and telephone numbers
- Telephone numbers derived from a random-digits process, which is available from a large number of commercial suppliers
- Databases of business addresses and phone numbers are also available from similar sources.

The choice of which database to use depends primarily on:
- the objectives of the project and the hypotheses being tested
- the extent to which the database covers the target population defined by the objectives and hypotheses. Beware of using databases that are convenient and close at hand but may represent a biased sub-sample of your true target population. For instance, a rideshare database clearly does not represent all carpoolers.
- the expected incidence or “hit rate” expected from the database for efficiency purposes, which is important but must not override the cautions noted just above.
Summary

If all of the above steps are taken, including:
- properly defined target population;
- random selection process;
- checking for proper representation, re-weighting if applicable;
- correct sample size drawn; and
- correct source chosen for the sample; then
the survey should produce reliable information. How useful that information is will depend largely on how well the survey instrument is designed to collect that information. While this manual will not attempt to instruct the reader on how to write surveys (which is a skill gained through years of practice and experience), there are a few general rules that a research sponsor should ensure are followed. Those guidelines are presented in the next section.
Chapter Five
Understanding Statistics

INTRODUCTION

It has been established earlier in this manual that survey research is an effective way to collect information to help evaluate Commuter Assistance Programs. The surveys can produce:
- baseline or benchmark data to which future results will be compared
- results to compare against baseline data
- information about the marketplace which can be used to redirect resources

It should be noted that a survey of a sample from a population, rather than a census of the population, carries inherent uncertainty. To illustrate the issue, take a deck of cards as an example. Suppose we could randomly select 20 cards from the deck and had to estimate (from the cards we drew) what percentage of the cards in the deck were black and what percentage were red. It is conceivable, albeit unlikely, that we would randomly select 20 red cards and no black ones. We would then be forced to conclude (incorrectly, of course) that all of the cards were red.

STATISTICS

The question that this section will answer is, how much uncertainty arises from a given sampling procedure and how are results analyzed in light of that uncertainty.

Confidence levels and confidence intervals

Two statistical concepts are used to describe the uncertainty arising from a sample:
- Confidence levels, which are a measure of the probability that the “true” result lies within a certain range. (The “true” result is the result we would have obtained if we had sampled the entire population rather than just a portion of it)
- Confidence intervals, which describe the size of the range mentioned above.

The confidence levels and confidence intervals are dependent on one another. Any given result has a confidence interval associated with a 95% level of confidence, a different (and smaller) interval associated with a 90% level of confidence, another associated with an 80% level of confidence, and so on.

For any given sample, the confidence interval and its associated confidence level can be determined through certain statistical formulas. The formulas may appear daunting at first but they are really quite simple to use. There are several different types of formulas. This section concentrates on the two types used most frequently in survey research:
- those relating to results reported as proportions (such as, “25% of the population carpool at least once per week)
those relating to results reported as means or averages (such as, “the average commute distance in the area is 14.6 miles.”

While it is not vital for a research sponsor to be able to calculate confidence intervals and perform significance tests, it is a good idea to understand where intervals come from and how tests are performed and what the resulting values mean. This chapter will present the information necessary to make the relevant calculations, and will follow with a table of fairly typical results that should allow the reader to get a general idea of what sort of confidence intervals to expect from data.

Proportions

Given a sample size and a result in the form of a proportion, the confidence interval associated with any given confidence level can be determined.

The first step is to determine the standard error of the percentage of the result. In some cases this value has been established, from prior research (such as the census). If the value of the standard error is not known (which is frequently the case), it can be estimated by the following formula:

$$\frac{\sqrt{p(1-p)}}{n}$$

where: 

- $n =$ size of the sample
- $p =$ sample proportion

The standard error is then multiplied by a factor, the value of which is dependent on the confidence level we wish to achieve. Some commonly used values are:

<table>
<thead>
<tr>
<th>Confidence Level</th>
<th>Factor Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>80%</td>
<td>1.282</td>
</tr>
<tr>
<td>90%</td>
<td>1.645</td>
</tr>
<tr>
<td>95%</td>
<td>1.960</td>
</tr>
<tr>
<td>99%</td>
<td>2.326</td>
</tr>
</tbody>
</table>

These values are valid as long as the associated sample sizes are relatively large (over 30 respondents or thereabouts).

The resulting figure is then added to the survey result to determine the upper limit of the confidence interval, and also subtracted from the survey result to determine the lower limit of the confidence interval.
Using the example mentioned above, suppose a sample of 200 respondents yields the result that 25% (or 40 respondents) carpool at least once per week. Our estimate for how the entire population behaves would then be calculated as follows:

\[ \sqrt{\frac{(0.25)(1-0.25)}{200}} = 0.031 \]

The confidence interval associated with each confidence level is then calculated:

<table>
<thead>
<tr>
<th>Confidence Level</th>
<th>Factor Value</th>
<th>Standard Error</th>
<th>Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>80%</td>
<td>1.282</td>
<td>0.031</td>
<td>0.040</td>
</tr>
<tr>
<td>90%</td>
<td>1.645</td>
<td>0.031</td>
<td>0.051</td>
</tr>
<tr>
<td>95%</td>
<td>1.960</td>
<td>0.031</td>
<td>0.061</td>
</tr>
<tr>
<td>99%</td>
<td>2.326</td>
<td>0.031</td>
<td>0.072</td>
</tr>
</tbody>
</table>

We can say, therefore that we are 80% confident (or, to be more precise, there is an 80% probability) that the proportion of the population that carpools once per week lies between \((0.25-0.04 = 0.21\) or) 21% and \((0.25+0.04 = 0.29\) or) 29%. This also implies that there is a 20% chance that the proportion of the population that carpools once per week lies between either 0% and 21% or between 29% and 100%. We can furthermore assume that the percent chance of the population’s proportion lying in the lower range is equal to the probability of the proportion lying in the upper range, meaning there is a 10% chance of that result being between 0% and 21%, and 10% chance of the result lying between 29% and 100%.

We are 95% confident (or there is a 95% probability) that the population’s result lies between \((0.25-0.061 = 0.189\) or) 18.9% and \((0.25+0.061 = 0.311\) or) 31.1%, and, as in the example above, we know that there is an equal chance of the result lying above or below those limits, so there is a 2.5% chance that the result is between 0 and 18.9%, and a 2.5% chance that the result is between 31.1% and 100%.

In cases where a significant percentage of the entire target population was surveyed, a factor is applied which increases our confidence in the results. Since the notion of statistical confidence is based on the idea that we might not have surveyed a truly representative sample due to purely random circumstances, it follows that our confidence will increase when we survey a larger percentage of the population, to the point where we are 100% confident if we have in fact surveyed the entire population. This becomes particularly relevant when we sample, for example, rideshare member databases, which might have 800 members and we might survey 250 or so of them.
The factor is calculated by the following formula:

\[
factor = \frac{(Total\ Target\ Population\ Size)}{((Total\ Target\ Population\ Size) + Sample\ Size - 1)}
\]

The factor is then multiplied by the actual sample size of the survey, and yields what is called the effective sample size. This effective sample size, rather than the actual sample size, should be used in all calculations where confidence intervals and analysis of differences require a sample size element.

You will notice from the formula that, unless the sample size is a reasonably large fraction of the target population size, the factor will be virtually equal to 1.

Means

The procedure for determining confidence levels and confidence intervals for results involving a mean value is almost identical to determining levels and intervals for proportions. The only difference is how the standard error is estimated.

Again, the value of the standard error may have been established from prior research. If the value of the standard deviation is not known (which is frequently the case), it can be estimated by the following calculation:

For each observation in the data, calculate:

\[(Result - Mean\ of\ all\ results)^2\]

which is equivalent to

\[Percentage \cdot (1 - Percentage)\]

This is known as the variance of the sample.

Then continue by taking the square root of the variance. This is the estimate of the standard deviation of the population, and is used in cases where a prior value has not been established. This is equivalent to:

\[\sqrt{Percentage \cdot (1 - Percentage)}\]

Next:

\[
\frac{Standard\ Deviation}{\sqrt{Sample\ Size}}
\]
This is the **standard error** of the mean.

It is instructive to note that the standard deviation is almost exactly equal to the average difference between each response and the mean value.

The standard error is then multiplied by a factor, the value of which is dependent on the confidence level we wish to achieve. Some commonly used values are:

<table>
<thead>
<tr>
<th>Confidence Level</th>
<th>Factor Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>80%</td>
<td>1.282</td>
</tr>
<tr>
<td>90%</td>
<td>1.645</td>
</tr>
<tr>
<td>95%</td>
<td>1.960</td>
</tr>
<tr>
<td>99%</td>
<td>2.326</td>
</tr>
</tbody>
</table>

**NOTE:**

*This type of calculation does make one major assumption that was not discussed in the section on percentages.* The observed value should be approximately normally distributed, which is to say there should be about \(\frac{1}{2}\) the results above the mean and \(\frac{1}{2}\) below the mean, and that there are more results close to the mean than there are far from the mean. A curve of the results should be bell-shaped.

*If the results do not follow this pattern, for instance if there are a huge mass of results between 0 and the mean and then fewer, more spread out results above the mean, this type of calculation is inappropriate.*

*Generally, survey results from larger surveys will follow the assumption of normal distribution. However, it is important to check the results to ensure that this is the case. Particularly with smaller surveys (50 or fewer respondents), the assumption may be violated.*

The resulting figure is then added to the survey result to determine the upper limit of the confidence interval, and also subtracted from the survey result to determine the lower limit of the confidence interval.

Using the example mentioned above, suppose a sample of 200 respondents yields the result that the average commute distance is 14.6 miles, and the variance turns out to be 256 miles. Our estimate for the **standard deviation of the population** would then be calculated as follows:

\[
\sqrt{256} = 16
\]
The standard error would be:

\[ \frac{16}{\sqrt{200}} = 1.13 \]

The confidence interval associated with each confidence level is then calculated:

<table>
<thead>
<tr>
<th>Confidence Level</th>
<th>Factor Value</th>
<th>Standard Error</th>
<th>Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>80%</td>
<td>1.282</td>
<td>1.13</td>
<td>1.45</td>
</tr>
<tr>
<td>90%</td>
<td>1.645</td>
<td>1.13</td>
<td>1.86</td>
</tr>
<tr>
<td>95%</td>
<td>1.960</td>
<td>1.13</td>
<td>2.21</td>
</tr>
<tr>
<td>99%</td>
<td>2.57</td>
<td>1.13</td>
<td>2.63</td>
</tr>
</tbody>
</table>

We can say, therefore that we are 80% confident (or, to be more precise, there is an 80% probability) that the true average commute distance of the population lies between (14.6-1.45=) 13.15 miles and (14.6+1.45=) 15.05 miles.

We are 95% confident (or there is a 95% probability) that the population’s result lies between (14.6-2.21=) 12.39 miles and (14.6+2.21=) 15.81 miles.

**Table of typical confidence interval sizes at 95% confidence level**

Below is a table of typical confidence intervals for means and proportions. 95% has been chosen since it is one of the most widely used confidence levels. The proportions that have been chosen are 10%, 25%, and 50%; the means are on 5-point and 10-point scales with fairly typical standard deviations (which, as was mentioned earlier, are pretty much equivalent to the average difference between each response and the overall mean value).

Keep in mind when using this table that the sample size refers to all respondents answering this question, not necessarily the sample size for the entire project. Some surveys will ask questions of only a portion of the respondents (for instance, “how many people are in your carpool” obviously will only be asked of people who do carpool). Keep in mind that this table also assumes a normal (i.e. bell-shaped) distribution, which is particularly prone to be violated when small sample sizes are used.
<table>
<thead>
<tr>
<th>Sample Size</th>
<th>10% proportion confidence interval</th>
<th>25% proportion confidence interval</th>
<th>50% proportion confidence interval</th>
<th>5-point scale Average diff. response to mean = 0.8</th>
<th>10-point scale Average diff. response to mean = 2.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>1.3%</td>
<td>2.7%</td>
<td>3.5%</td>
<td>0.11</td>
<td>0.31</td>
</tr>
<tr>
<td>100</td>
<td>0.9%</td>
<td>1.9%</td>
<td>2.5%</td>
<td>0.08</td>
<td>0.22</td>
</tr>
<tr>
<td>150</td>
<td>0.7%</td>
<td>1.5%</td>
<td>2.0%</td>
<td>0.07</td>
<td>0.18</td>
</tr>
<tr>
<td>200</td>
<td>0.6%</td>
<td>1.3%</td>
<td>1.8%</td>
<td>0.06</td>
<td>0.16</td>
</tr>
<tr>
<td>250</td>
<td>0.6%</td>
<td>1.2%</td>
<td>1.6%</td>
<td>0.05</td>
<td>0.14</td>
</tr>
<tr>
<td>300</td>
<td>0.5%</td>
<td>1.1%</td>
<td>1.4%</td>
<td>0.05</td>
<td>0.13</td>
</tr>
<tr>
<td>500</td>
<td>0.4%</td>
<td>0.8%</td>
<td>1.1%</td>
<td>0.04</td>
<td>0.10</td>
</tr>
<tr>
<td>1,000</td>
<td>0.3%</td>
<td>0.6%</td>
<td>0.8%</td>
<td>0.03</td>
<td>0.07</td>
</tr>
<tr>
<td>1,500</td>
<td>0.2%</td>
<td>0.5%</td>
<td>0.6%</td>
<td>0.02</td>
<td>0.06</td>
</tr>
</tbody>
</table>

**Determination and analysis of differences for significance**

The previous section demonstrated that there is uncertainty about any result that comes from a sample. The "true" result of the target population that was sampled from may not be the same as the result that was obtained from the sample. Statistics allows us to know what is the probable range in which that true result falls.

Now suppose this concept is taken one step further. Suppose we survey two different populations, or even one population at two different times, and obtain two results. There will be uncertainty about each of these results, as demonstrated in the previous section. Since we're uncertain about the first result, and uncertain about the second result, they sample results could have come out differently even if both populations had the same "true" result.

For example, suppose we sample one population at two different times, and determined the percentage of commuters who carpooled at least once per week. Suppose in the first sampling we obtained a result at a 95% confidence level of 25% +/- 6.1%, and in the second we obtained a result of 28% +/- 6.1%. Even though the samples both yielded different results, the "true" result could have been 26% in both cases; or it could have been 24% in both cases, or 30%.

If we obtain two results from independent samples, how do we know if the "true" results that they represent are different? The answer comes from an extension of the concept of confidence intervals and confidence levels. If it is possible to determine the percent chance that the "true"
result lies within a certain range (for example, in the first of the two carpool results we know that there is a 95% chance that the result lies between 18.9% and 31.1%, a 2.5% chance that the result lies between 0 and 18.9%, and a 2.5% chance that the result lies between 31.1% and 100%, and we know the analogous ranges for the second result), then it should be possible to determine what the chance is that both results lie within a certain range for any given confidence level. If we can do that, we can determine what our confidence level is that the “true” results represented by the results of the sample are in fact different. That, in a nutshell, is the concept of statistically significant differences. The rest is applying the appropriate formulas.

**Significant differences for proportions**

It is not particularly important for research sponsors to comprehend the mathematics behind testing for statistically significant differences. An understanding of the discussion above is quite sufficient. However, for the more mathematically-minded readers, the formulas are presented.

Given two proportion results from two independent samples, the procedure to determine whether or not the proportions are statistically significantly different is:

1. Calculate the value of $d$:

   $$
   d = \frac{((\text{Sample size 1} \times \text{Result 1}) + (\text{Sample size 2} \times \text{Result 2}))}{(\text{Sample size 1} + \text{Sample size 2})}
   $$

2. Calculate the value of the following formula:

   $$
   \sqrt{\frac{((\text{Result 1} - \text{Result 2})^2)}{(\text{Sample size 1} + \text{Sample size 2})^2}} \times \sqrt{d \times (1-d)}
   $$

3. Compare this result to the following table:

<table>
<thead>
<tr>
<th>If the formula value is</th>
<th>The confidence level that the results are significantly different is:</th>
</tr>
</thead>
<tbody>
<tr>
<td>at least</td>
<td></td>
</tr>
<tr>
<td>1.282</td>
<td>80%</td>
</tr>
<tr>
<td>1.645</td>
<td>90%</td>
</tr>
<tr>
<td>1.96</td>
<td>95%</td>
</tr>
<tr>
<td>2.57</td>
<td>99%</td>
</tr>
</tbody>
</table>

80
Significant differences for means

The method for testing for significant differences between mean results follows the same general pattern as the test for proportions:

1. Calculate the variance for each of the two sample results:

\[(\text{Result} - \text{Mean of all results})^2\]

2. Calculate the value of the following formula:

\[
\sqrt{\frac{(\text{Result}_1 - \text{Result}_2)}{\text{Variance}_1 / \text{Sample size}_1 - \text{Variance}_2 / \text{Sample size}_2}}
\]

3. Compare this result to the following table:

<table>
<thead>
<tr>
<th>If the formula value is at least</th>
<th>The confidence level that the results are significantly different is:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.282</td>
<td>80%</td>
</tr>
<tr>
<td>1.645</td>
<td>90%</td>
</tr>
<tr>
<td>1.96</td>
<td>95%</td>
</tr>
<tr>
<td>2.57</td>
<td>99%</td>
</tr>
</tbody>
</table>

Statistically significant differences versus meaningful differences

It is easy to get carried away making calculations of statistical significance of differences, and to lose sight of whether or not those differences are meaningful. Particularly confusing is the question, “is that difference significant?” when what the question really means is, “is that difference meaningful?”

The answer may very well be, “The difference is statistically significant, but it isn’t meaningful.” For instance, we might discover that left-handed drivers who ride in carpools drink 1.2 cups of coffee each morning, whereas right-handed drivers who ride in carpools drink 2.8 cups of coffee each morning. Given a reasonable sample size and low variance, this might very well constitute a statistically significant difference. However, while Maxwell House might decide this difference is meaningful, it is doubtful that most CAP managers would find any use for it.
While the above example is admittedly a bit flippant, it demonstrates clearly the difference between significant differences and meaningful differences. This leads back to the discussion at the beginning of the section on formulation of hypotheses. The concepts of confidence intervals, confidence levels, and statistically significant differences allow you to design experiments and test hypotheses that you have made about the population. When the confirmation or denial of the hypotheses leads to re-allocation of resources and effort, the survey has performed its function effectively.
Chapter Six
Survey Planning and Budgeting

INTRODUCTION

This chapter will focus on decisions the CAP will have to make before conducting an evaluation. Specifically, the focus of the chapter will be on how to plan and fund an evaluation. While this sounds simple enough, many of the considerations discussed below can have a profound impact on survey costs and data reliability.

SURVEY TIMING

Timing can be a key issue in conducting surveys and can have a significant impact on results if not properly controlled for. In the cable television industry, for example, it is important not to conduct customer satisfaction surveys immediately after rate increases are announced. Employee satisfaction studies are usually not conducted immediately after reviews and/or pay increase announcements for similar reasons. Attitudes towards use of commute alternatives can be affected by prevailing weather patterns, such as extreme heat (or in the case of northern areas, extreme cold). Some elements of timing to be considered when planning surveys include:

Seasonality

Seasonality can be a major issue in survey results, particularly in an area like Florida where there is a high influx of seasonal residents with predictable impacts on traffic levels. Studies evaluating the perceived (or actual) level of congestion will be significantly affected by the season in which they are conducted.

It is not always possible to conduct surveys at "ideal" times, nor is it always possible to determine what an "ideal" time may be. The best approach is usually to do as much as possible to ensure that prevailing conditions are similar when a follow-up survey is conducted. For instance, doing an initial "congestion perception" study during low season, implementing some reduction procedures, and then following up during high season would be methodologically poor, and would probably lead to the conclusion that the policies implemented had actually increased rather than decreased congestion.

Frequency

Survey frequency is another issue that must be dealt with. Budget available is usually a major issue in determining potential survey frequency. Budgets seldom allow for tracking surveys to be conducted more than once a year (if that).

In cases where seasonality may be an issue (see above), you may want to consider spreading your interview process throughout the year rather than doing all of the interviews at once. This allows
for calculation of a rolling average once you have conducted enough interviews to get a baseline, and may give you fairly up-to-the-minute insight into any new situations that may affect your customers or whoever else you are surveying. However, this approach generally involves more expense, particularly if you are having your surveys updated every time you conduct them.

**Timing evaluation results for planning and budgeting purposes**

Evaluation results are typically desired for year-end evaluations and new year planning purposes. In order to effectively integrate the results of the evaluations into the planning process, the survey must be conducted reasonably far in advance of the planning period. Suggested advance times to start planning the surveys are:

<table>
<thead>
<tr>
<th>Type of Survey</th>
<th>Advance Time to Start</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus Groups</td>
<td>2 Months</td>
</tr>
<tr>
<td>Mail Surveys</td>
<td>4 Months</td>
</tr>
<tr>
<td>Written, hand-distributed surveys</td>
<td>2 Months</td>
</tr>
<tr>
<td>Telephone Surveys</td>
<td>3 Months</td>
</tr>
<tr>
<td>Personal Interviews</td>
<td>6-8 Months</td>
</tr>
<tr>
<td>Panels</td>
<td>N/A, since this is generally an ongoing process.</td>
</tr>
</tbody>
</table>

**Budgeting**

The primary decision made when budgeting for a survey is the determination of sample size. The concept of how sample size affects the precision of results has been discussed previously. The question that a research sponsor must answer is, how much is the extra precision and certainty from the larger sample size worth?

As a rule of thumb, to get a “quick and dirty” estimate for a population, a sample size of at least 150-200 should be considered. This allows for a wide range of uncertainty, but generally gives a fair idea of the population’s attitude.

For a good, solid estimate of the tendencies of a population, sample sizes of 400 or respondents should be considered. Often a sample size of 400 or so may be used to establish benchmarks, and then 200 additional interviews are used as follow-ups to gauge whether there has been any change since the initial study was done.

**PLANNING SURVEY PROJECTS**

Probably the single most important step in planning any research project is the initial planning step. The survey must meet that data needs of the evaluation that you are conducting. If the
project is poorly planned in the initial stages, there is virtually no chance that it will result in useful data and meaningful, valuable changes in policy and operations.

The most effective way to plan a research project is to take a rigorous, scientifically-based approach. Ideally, this type of project will be approached as if it were a measurement of a natural phenomenon, as in chemistry, biology, or physics. The basis of the research should be the same as in those sciences. Research design should follow the classic process of hypothesis, experiment, and conclusion. Fortunately for researchers, the types of problems encountered don’t demand the analytical complexity of problems in the sciences, but they do demand proper planning and design.

There are five essential elements that any research sponsor must have firmly in mind when initially organizing a research project:
- Given the evaluation being conducted, what decisions will be made with the results of the survey? Or alternatively, how will current operations, policies, and resource allocations be changed based on the survey findings?
- Given the decisions that are being made with the research, what is (are) the specific hypothesis (hypotheses) that is (are) being tested by the research?
- What are the pieces of data that need to be determined in order to make the prove or disprove the hypothesis, and in what form should they be measured? Furthermore, since a sampling process is involved, how confident do we need to be of the results? Is it sufficient for the results to be within 5%, 10%, 50%?
- What are the best sources of information? Does data already exist that answers this question? If not, where is the best place to look for it? If surveying is involved, who are the best people to ask questions of and collect data from?
- How much budget is available to conduct the research?

Each of these areas will be discussed in more detail below:

**Step 1: Identify decisions to be made**

The evaluation selection process should be a key step in identifying the decisions that are to be made. These decisions should be made explicit at the beginning of the project. This step is unfortunately often omitted from the research process. Even if the evaluator has determined that they will conduct a needs assessment, it is easy to get into trouble by setting vague objectives such as “I want to know what my rideshare database members demographics are.” This approach often leads to faulty research design. Often the managers assume that the personnel in charge of actually conducting the research have the same perception of the project’s goals, only to find out as the data comes back that some elements were left out or misinterpreted. Or the research sponsor will assume that he or she understands the process so well that the step of specifying the decisions can be skipped, and the sponsor needs only to ask for specific data elements. This is a serious mistake - the sponsor often discovers new data elements that are needed that could easily have been identified if the planned decisions had been made explicit.
The sponsor should always ask for information by specifying the decisions to be made, and never merely ask for data. A research sponsor doesn't want to "know the demographics" just to know them. They want to evaluate specific portions of or processes within their organization, or perhaps want to determine which specific actions are required to make the program more effective, such as whether new marketing campaigns are needed, if the entire spectrum of the area's population is being served, and if not, which ones are undeserved and why and should resources be allocated to target those groups, and so forth. A simple profile of demographics may or may not provide the data necessary to make those decisions. But if the decisions that are going to be made are known in advance of the design of data-collection instruments and procedures, efficient and correct instruments, sampling plans, and analytical tools can be identified and put to use.

This point cannot be re-iterated too many times. A large number of research projects, possibly even a majority, suffer from a lack of pre-planning and identification of decisions to be made, sometimes to the extent that the entire effort ends up being useless or misleading.

It should be noted that in cases where decisions have been made and will not be changed, due to commitments, regulatory requirements, etc., it is wasteful to spend research dollars to show whether the decision is right or wrong. The research should be directed towards decisions that have not been made and will be made more effectively with additional information at hand.

The decisions that will be made based on the survey results should be explicitly identified by the research sponsor. Will resources be re-allocated and if so, how. If the project is evaluative, how will the evaluation be used to improve operations, policies and procedures, and specifically which operations, policies, and/or procedures are being evaluated? All of this information should be laid out on paper as the first step. Following completion of this effort, the next step is to generate the hypotheses to be tested by the research project.

**Step 2: Hypothesis generation**

Any experiment in any discipline must test a hypothesis. A research project is an experiment like any other; it should test and either confirm or reject a specific hypothesis (or multiple hypotheses). The hypothesis should take the form of a direct statement, as in "Carpoolers have a significantly different set of demographics than people who drive alone", or "75% of all rideshare database members have a high level of satisfaction with the ridematching service, 'high' being defined as 8, 9, or 10 on a 1-10 scale." The research sponsor should identify the decisions to be made by the evaluation (step 1 above). Then the research sponsor and the research project manager should work together on generating the hypotheses that, when tested, will provide the sponsor with the information needed for the decisions to be made.

The following elements must be present in any sound hypothesis:
- The *measurement* that is being made and tested (such as a percentage, or an average rating)
- The *scale* that the measurement is being made on (for example, the minimum threshold level where a numerical scale is involved, or the actual statements used in categorical scales)
- The *source, or target population,* from which the information will be drawn (such as "rideshare database members" or "all commuters" or "residents of the 5-county area").

If, for example, a re-allocation of resources to target groups that are under-represented in a ridesharing database (compared to the service area’s population) is the decision under consideration, one might generate the following hypotheses:

1. The demographics of the ridesharing database are significantly different than the commuter population of the area, specifically in terms of: Income, age, race, gender, presence of children under age 6. (The list might be lengthened, or some elements might be dropped. But the hypothesis should be explicit.)

2. Those demographic groups that are under-represented in the database have a certain minimum threshold interest in carpooling. The minimum threshold interest should also be made explicit: e.g., 20% of the commuters in the area who are in these groups say they are “somewhat or very” interested in carpooling at least once per week on a regular basis. Or one might hypothesize that their interest level is *not* significantly different than the interest level of the demographic groups that are over-represented in the database.

3. One might also generate a hypothesis about the media that would be most useful to use to reach this population. However, it is also quite possible that few media are available (perhaps just direct mail and newspapers) within the budgets allowed, so that regardless of what the research finds, the same approach will be taken. As mentioned above, it is a waste of time and money to identify and collect data for a decision that has already been made and cannot be changed.

The hypothesis should be specific, and should be a direct statement that will either be confirmed or denied by the research. Vague statements like, “Rideshare database members are satisfied with the service provided to them” are not useful or effective hypotheses, because they leave open to interpretation exactly what “satisfied” means. Does this refer to *every* database member? Does it refer to an *average* level of satisfaction, and if so, how is “satisfaction” defined? A better statement would be, “75% of all rideshare database members will say that they are very satisfied (or will rate their satisfaction at least an 8 on a 10-point scale, if a numerical scale will be used) with the ridematching service provided to them.”

**Step 3: Identification of data needed to prove or disprove hypotheses**

*Identifying Data Needs*

Many research sponsors and research project managers begin their evaluation process at this step, and call it “determining what we need to know.” Sometimes, this even takes the form of writing survey questions and specifying response patterns (scales, categories, etc.) without first specifying the type of evaluation being done, what processes or parts of the organization are
being evaluated, the decisions to be made with the research, the hypotheses being tested, or the data needed to test the hypotheses, thus greatly compounding the potential for error. As we have seen, it is impossible to effectively determine data needs without having explicit hypotheses. And it should be clear that survey questions should definitely not be written before data needs are determined.

When the hypotheses have been generated, identifying the data needed is actually quite straightforward. By reviewing the hypotheses used above as examples, it is clear that respondent demographics and stated intentions or interests will be included on the questionnaire. It is likely that other hypotheses will have been generated in the planning process as well.

When the data needed have been properly identified, it usually also fairly straightforward for a survey research professional to create the actual survey questions and response scales and/or categories to be used. While it is certainly appropriate for a research sponsor (and presumably this sponsor is not an experienced survey research professional) to review and comment on a questionnaire, it is not advisable for a non-professional to formulate the actual questionnaire. Issues of response bias, question order bias, skip pattern complexity, response choice formatting and design, types and formats of data needed for certain statistical tests and modeling procedures, standard response scaling used in particular types of questions, etc., are all important in questionnaire design but are not issues that most research sponsors are familiar with or need to be familiar with.

The Importance of Control Groups

One key concept that is often ignored in evaluations of program effectiveness, particularly where there is a question of what the impact of a program has been, is the notion of a control group. A control group is a population that is exactly (or as close to exactly as reasonably possible) like the group on which you are measuring the effects of the program, except that it has not been exposed to the program. The measured behavior (such as percentage of people carpooling) should be measured both for the experimental group and the control group to determine what the effectiveness of the program has been. Many experiments skip the step of having a control group by assuming that a control group would have experienced no change in behavior, and thus any measured change in the experimental group is due to the program.

This approach can lead to very erroneous conclusions. A major decrease in the price of gasoline, for instance, may reduce the number of people carpooling in the population. If the group that was exposed to the program shows a very small increase in carpooling, it may be concluded that the program was ineffective. However, if it was also known that carpooling within a control group actually dropped by 15%-20% due to the decrease in gasoline, a different conclusion might very well be reached.

Due to cost constraints, it is sometimes impossible to conduct a research project with an appropriate control group. Other data sources, such as census data, may have to serve as a
surrogate for data from a true control group. It is extremely important, however, to understand the notion of a control group and how results from the control group may impact conclusions reached from research data.

The Concept of Sampling

Usually, a research project will involve conducting tests on a sample of the population rather than every member of the population. This occurs because few research sponsors can afford to sample every member of a target population. When this happens, statistical uncertainty is created in the results based on whether the sample accurately represents the population. This is not a question of proper sample design procedures. It is a fact of the sampling process.

To illustrate the issue, take a deck of cards as an example. Suppose we could randomly select 20 cards from the deck and had to estimate (from the cards we drew) what percentage of the cards in the deck were black and what percentage were red. It is conceivable, albeit unlikely, that we would randomly select 20 red cards and no black ones. We would then be forced to conclude (incorrectly, of course) that all of the cards were red.

Statistical procedures exist that identify what the probability is of having made an error in sampling, and how large that error might be. What must be determined before an experiment is undertaken that involves sampling is what level of potential error will be tolerated. This is usually based on the importance and economic ramifications of the decision being made with the research results. This issue was discussed at length in the sections of this manual covering sampling and statistics.

Step 4: Identifying information sources

There are a number of possible sources for information. To determine demographics, for example, there is a wealth of free data available from the U. S. Census. This includes the standard population and housing surveys. In addition, the census releases other, more customizable products, such as the Public Use Microdata Samples (PUMS) which allow the user to create customized cross-tabulations of any census long form data from a 1% sample of all census long forms returned.

Many Commuter Assistance Programs have a number of evaluative tools available from their own records. These include match rates, number of vans in service, number of companies contacted, number of commuters in the database, and so forth. Traffic count data, available from local Department of Transportation Offices, can also be useful in evaluations and analysis.

In many cases, however, there will be a particular hypotheses that simply can’t be proven or disproved by publicly available information, particularly when subjective evaluations (such as satisfaction ratings, ratings of agency responsiveness, and so on) are required. When that situation arises, survey research can provide the means for answering many of these questions. It
is therefore imperative that the evaluation planner carefully review all available sources before beginning the survey process.

In a survey research project, it is crucial to ask the right questions. That will be accomplished by carefully following the steps outlined above. It is equally important, however, to ask those questions of the right people. Identifying those people is the crucial first step in developing the sampling strategy. Suppose we determine that we want to estimate the interest level in carpooling among commuters who are not currently in our ridesharing database, as shown in some of the examples above. No matter what questions we ask, we aren’t going to get good estimate by interviewing retirees. The goal of the sampling plan should be to identify commuters and interview them and only them. Data from other groups, such as retirees or vacationing families, will not provide data that will help to prove or disprove our hypotheses.

The hypothesis or hypotheses should always give an indication of where to draw the sample from. The hypotheses given above specifically mention “carpoolers” and “rideshare database members.” As mentioned earlier, a sound hypothesis should always contain the source, or target population, from which the information will come. If the hypothesis is properly constructed, determining the correct population should not be difficult.

Actually obtaining responses from people in those groups and verifying that your respondents did belong to those groups may be more of a challenge. If no available sources exist to pre-identify the people you are contacting as belonging to your target population, it may be necessary to include an identification question (often called a screener) in your survey instrument. The screener is essentially a question that verifies the identity of the respondent in relation to the target population. Many surveys have quotas for males and females, for example. Often a research sponsor wishes only to obtain survey responses from adults. (18 or older, or 21 or older) If, as in the case above, one only wants to collect data from commuters, a question very early in the survey would ask something like, “do you commute to work at least three times per week?” to verify that the respondent was in fact in the target population.

Even when a database identifies a person as a member of a target population, it is often a good idea to verify the information through use of a screener. Sometimes databases are out of date or have errors in the entry of data. Using a screener can avoid unnecessary expenditure of usually scarce research dollars on unwanted responses.

**Step 5: Determining budget available and the best way to use it**

There is often very little leeway in how much budget is available to conduct research. Budget constraints are a very important factor in determining research directions. Limitations on expenditures may eliminate the possibility of conducting certain types of research, or may so limit the number of survey responses you can obtain as to make the information gained of little value. Some objectives may have to be recast in the light of budget realities, particularly in terms
of the confidence levels the research sponsor is willing to accept from the data. These considerations must be weighed as the sampling and interviewing plan progresses.

Different types of surveys are available at varying levels of cost. To some extent, the surveys meet different types of objectives. Some survey formats are incompatible with certain objectives. For instance, those with limited budgets may be tempted to use focus groups to prove or disprove quantitative hypotheses (such as, “50% or more of commuters favor HOV lanes over toll roads”). Unfortunately, focus groups are not designed to handle quantitative issues.
Chapter Seven
Communicating Evaluation Findings

INTRODUCTION

While a CAP can take every precaution and devise a nearly flawless evaluation methodology, the value is lost if the CAP cannot effectively communicate the results of their efforts. This chapter will focus on ways in which the Commuter Assistance Programs in Florida can communicate evaluation findings to a variety of audiences.

GETTING TO KNOW YOUR AUDIENCE

To develop an effective evaluation report, the CAPs must first understand who their audience is, what information will be of interest to them, and when should the information be available to satisfy that audiences' needs.

Who is the audience for a CAP evaluation report and what do they want to know?

Although the audiences for a CAP evaluation report will differ by CAP, a number of groups with interest in the CAP can be identified. These include the following:

- Funders
- CAP Staff
- CAP Program Directors
- Board of Directors
- Media
- Service Providers
- Politicians
- Clients
- Community Groups
- Other interested parties

Each of these audiences has specific needs from an evaluation. It is up to the CAP to identify what those needs are and to ensure that the information of interest is provided in the evaluation report. Each of these audiences is discussed below.

*Funders*- Are an important audience for CAP Evaluation reports. This group will want to ensure that the money provided is being used wisely to achieve identified goals. Prior to beginning an evaluation, the CAP should contact its funders to determine what specific expectations of the CAP program are, and develop an evaluation that answers those questions.

*CAP Staff*- This is an important audience for CAP evaluation reports because this group is the one that will be most affected by the results. CAP staff can use the evaluation to streamline efforts,
to clarify the customer service focus, and to correlate efforts with the achievement of CAP mission and goals.

**CAP Program Director**- The evaluation should help the director determine if current focus and efforts are achieving desired results. An effective evaluation will help the director refine efforts and target new actions that can help achieve stated goals.

**Board of Directors**- The evaluation is important to the Board because it helps them determine if their guidance and policy directions are effective in meeting program goals. The evaluation will also help in determining future Board roles.

**Media**- The media will want evaluation two things from an evaluation. They will be interested to see if the CAP is meeting its objectives, and they will want anecdotal information that can be used in developing newspaper copy. If anecdotal information is good, the media will develop articles that can be an excellent source of program promotion.

**Service Providers**- Third party providers, such as taxi companies for guaranteed ride home, can use CAP evaluation results to improve the services provided on behalf of the CAP. Many of these service providers have specific internal customer service and/or satisfaction goals that they want to achieve. The CAP evaluation can help them define their success.

**Politicians**- The CAP evaluation can help the politician determine if the needs of constituents are being addressed. The evaluation can also serve as an educational/promotional opportunity because it can provide the politician with information about CAP activities and services. Ultimately, the evaluation can serve as a decision-making tool.

**Clients**- Customers of the CAP are interested in learning about changes in services and how these changes can affect them. They may also be interested in learning how their actions have contributed to the community and/or program success.

**Community Groups**- Many community groups will be interested in learning what services of the CAP can be beneficial for their success. They may also be looking for ways in which their group and the CAP can work together collectively to achieve common goals. Finally, the community groups may also view the evaluation in the context of comparing their achievements with that of the CAP. This can be especially true if the CAP is a private non-profit that may be competing for funding.

However, when developing an evaluation for a particular set of audiences, the CAP should keep in mind several important considerations. According to Morris, Fitz-Gibbon, and Freeman in “How To Evaluate Evaluation Findings”, these considerations are:

- *Different users want different information—even to answer the same question.* A funding agency may accept only valid and reliable test data to prove that a staff training program
has been effective, while the personnel participating in the training program would find anecdotal reports and responses from interviews or questionnaires to be the most valid and believable evidence of program effects. Other audiences might require both kinds of information.

Some users do not know what they need. In programs where evaluations are mandated by legal requirements, for example, evaluation clients or program staff may see the assessment simply as a trial to be endured, not necessarily as a process that will lead to useful information and enlightened decisions. If the users are not willing to commit to some criteria for measuring success before the evaluation starts, it is highly unlikely that they will accept or use your final recommendations. Formative evaluators consistently face the task of helping clients define not only program objectives, but also specific evaluation information needs.

Some users expect the evaluation to support a specific point of view. They have already made up their minds about the strengths and weaknesses of the program, and they expect that the evaluation will only confirm their opinions. The results of the evaluation may very well not support their preconceptions. So it is vital that the evaluator identify the opinions early on so that he or she can anticipate potential controversies and design reporting procedures which take them into account. Alerting users to your finding discrepancies between their assumptions and the findings as they emerge rather than solely in a final report will make the users more receptive. In fact, an effective evaluation report will contain no surprises, especially with respect to central issues. All of the major questions will have been discussed with program personnel and decision makers from the very beginning, well before the final reporting stage. If the evaluation does not bring these issues to light early, the evaluator loses credibility.

For some users, the information needs change during the course of the evaluation. It is not at all uncommon when a formative evaluation is well under way, for the users to identify new information they would like to have. Some trainers, for example, might mention that the computer operators in a pilot training program seem to be learning a new data processing system, but the operators have developed a strong dislike for the system. You might change your evaluation plans to include some attitude measures. Although you cannot constantly alter evaluation plans, try to reserve some small portion of your resources to meet requirements for unexpected information that crops up during program implementation.

As the CAP develops its evaluation, it needs to be aware of these issues and plan accordingly. In most cases, the CAP office will have to decide how to best meet the needs of its primary audience, and develop its evaluation program to meet those needs.

**When is the best time to conduct an evaluation?**

The simple answer to this question is to say when it will be most useful. The better answer would be to say whenever the evaluation can be used to improve services and the effectiveness of the CAP. In reality, if an evaluation is to be used by all of the potential audiences listed above, then the CAPs would have to continuously evaluate their success. Such an evaluation schedule is impossible, so the CAP should prioritize the most important audiences and complete evaluations to coincide with prioritized needs. Even then, the CAP may need to make some important decisions.

For example, if the purpose of the evaluation is to improve service to justify increased funding, then it stands to reason that the evaluation should be completed to coincide with funding cycles. However, budgets are developed after plans and programs have been determined. This often occurs six months before funding is determined. If the evaluation cannot be used to make improvements to service, or used to determine what services should be offered, then the evaluation may be completed too late to justify increased funding levels that reflect new services.

The following agencies should be contacted in your area to determine when budget and funding decisions are made and when the CAP should be prepared to make its pitch for funds.

- Metropolitan Planning Organization
- Florida Department of Transportation District Office
- Local City, County Governments
- Transit agency
- Private foundations

With the exception of private foundations, most of the agencies listed above will be on one of two funding cycles, the fiscal year cycle or calendar year cycle. Most fiscal year cycles run July 1-June 30, although federal programs begin a new fiscal year on October 1. As the name implies, calendar year cycles run January 1-December 31.

For private foundations, the exact timing of funding decisions varies greatly and the same foundation may make funding decisions multiple times during the year. For example, the Energy Foundation meets three times a year to review proposals for funding decisions, and requires that materials and proposals be submitted at least eight weeks in advance.

Regardless of who is providing the funds for the CAP, all will probably require an evaluation of efforts. When these evaluation results are due (as well as what will be evaluated and how) should be determined when the grant is provided. If an evaluation measure is to be tracked
internally by the CAP (i.e. number of inquiries about CAP services), the monitoring and/or evaluation should be continuous. This can be especially beneficial if funds are received from FDOT sources who generally require that the CAP include quarterly reports of progress. Again, these requirements will be spelled out when the grant is provided.

**Documenting Evaluation Findings**

Once evaluations are complete, the CAP must decide how best to convey the results of the evaluation. This is a crucial step that must not be overlooked. A well-designed and carefully managed evaluation can be wasted if the results are not presented in a clear and understandable format. It is also important to remember the potential audiences for the evaluation results and what reporting format will be most useful to meet their needs. The CAP should also be aware that documenting results of evaluations can also be done verbally.

For example, the CAP may be called upon to make a presentation to the County Commissioners on the results of the evaluation. The presentation may be the first exposure the Commission has to the results, and how the results are presented could go a long way in obtaining funding. If the CAP evaluation draws media attention, the results may be broadcast on the radio or television, two mediums of communication in which written documentation will not be used.

While most CAP offices will commonly be required to disseminate evaluation results in technical reports and/or quarterly progress reports, other forms of communication will typically be used. A list of potential communication mediums for evaluation results include:

- Technical Report
- Executive Summary
- Brochures
- Press Releases
- Trade Journal Article
- Memorandum
- Public Workshop
- Conference/Seminar Presentation
- Face-To-Face Discussion

Of the audiences for a CAP evaluation report, funders, board members, and CAP staff will have the most interest in a full technical report. Since two of these three audiences have other duties beside CAP oversight, the technical report should be clear and concise, as well as technically credible. A well-written technical report will become a reference manual for this audience.

For politicians, the media, community groups, and clients the preferred written document will be the executive summary. Even funders and staff will use the executive summary for their own needs. Therefore, the executive summary can be the most important document the CAP will write to disseminate evaluation findings. The summary should be brief, highlight the most
important findings of the evaluation, and report the major recommendations of the analysis. Strong support graphics that depict the most important results can be beneficial in the executive summary.

The other communication mediums listed serve specific audience needs. Depending on how the CAP chooses to handle the evaluation findings will dictate which of these mediums will be used and how they will be used. To strengthen these types of reports, the CAP office should try to determine what evaluation findings are the most important to the audience and focus on preparing a report that best meets that need.

Finally, while the form of communication is important, the CAP must focus its attention on the content of the document. The CAP should:
- Tie together evaluation findings with stated program goals, objectives, and mission of the CAP;
- Compare results to implementation plan and the progress made;
- What effects have changes in program offerings had on service;
- CAP efficiency;
- Examine program strengths and weaknesses
- What problems have arisen, or what trends have changed that may have an impact on results;
- What changes or actions are recommended.

Other important items to consider in the report are:

- Relate information provided to necessary actions
- Make the report credible
- Give the audience what it needs, but don’t overdo it
- Present an attractive and readable document
- Put the most important results first
- Highlight the successes and most important information

The key for most CAP offices is to look at the evaluation and evaluation report as a powerful tool. If the tool is used effectively it can show the diligence of CAP efforts, the impact the CAP has on meeting community goals and service needs, and the importance of the CAP in solving local and regional problems. A properly planned and well-documented evaluation can be an excellent medium for promoting the CAP and increasing awareness of the community on the important role the CAP plays in Florida municipalities.
APPENDIX A

Sample Database Member Survey
CAP Evaluation Rideshare Database Survey

Good evening. My name is ___________ and I am with ___________, a market research company. This evening we are conducting a short survey on commuting in the (Insert area name here) area. We are not attempting to sell you anything, we are only interested in your opinions.

(Ask to speak to person named on sample sheet - repeat intro if necessary)

1. How many days per week do you commute to work?
   _____ (if 0 TERMINATE)

2. And about how far is your commute to work, in miles? _______

3. Have you ever heard of (Insert name of ridesharing organization here)?
   1- Yes 2- No (Go to END) 9- Don’t Know/Refused

4. Have you ever contacted (Insert name of ridesharing organization here) for carpool or vanpool information, or not?
   1- Yes 2- No (Go to END) 9- Don’t Know/Refused

5. Did (Insert name of ridesharing organization here) provide you with carpool, vanpool, or transit information or assistance, or not?
   1- Yes 2- No (Go to END) 9- Don’t Know/Refused

6. To what extent did the information or assistance provided by (Insert name of ridesharing organization here) influence the way you commute to work? Did it:
   1- Have a great deal of influence
   2- Have a moderate influence
   3- Have a slight influence
   4 - or have no influence at all

7. Did you ever carpool after you received the information, or not?
   1- Yes 2- No (Skip to Q. 15) 9- Don’t Know/Refused

8. Are you still carpooling to work?
   1- Yes 2- No (Skip to Q. 12) 9- Don’t Know/Refused

9. About how many days per week are you carpooling?
   _____ (Enter 0 if question is skipped)

10. About how many people are usually in your carpool, including the driver?
    _____ (Enter 0 if question is skipped)
11. About how long have you been carpooling?
   _____ Days _____ Weeks _____ Months _____ Years

[SKIP TO Q. 15]

12. About how long were you in your carpool?
   _____ Days _____ Weeks _____ Months _____ Years

13. How many days per week were you carpooling?
   _____ (Enter 0 if question is skipped)

14. About how many people were usually in your carpool, including the driver?
   _____ (Enter 0 if question is skipped)

15. Did you ever carpool to work after you received the information, or not?
   1- Yes 2- No (Skip to Q. 23) 9- Don’t Know/refused

16. Are you still carpooling to work?
   1- Yes 2- No (Skip to Q. 20) 9- Don’t Know/refused

17. About how many days per week are you carpooling?
   _____ (Enter 0 if question is skipped)

18. About how many people are usually in your carpool, including the driver?
   _____ (Enter 0 if question is skipped)

19. About how long have you been carpooling?
   _____ Days _____ Weeks _____ Months _____ Years

[SKIP TO Q. 23]

20. About how long were you in your vanpool?
   _____ Days _____ Weeks _____ Months _____ Years

21. How many days per week were you vanpooling?
   _____ (Enter 0 if question is skipped)

22. About how many people were usually in your vanpool, including the driver?
   _____ (Enter 0 if question is skipped)

23. Did you ever ride the bus to work after you received the information, or not?
   1- Yes 2- No (Skip to q. 29) 9- Don’t Know/refused
24. Are you still riding the bus to work?
   1- Yes          2 - No (Skip to Q.27)         9- Don’t Know/refused

25. About how many days per week are you riding the bus to work?
    _____ (Enter 0 if question is skipped)

26. About how long have you been riding the bus to work?
    _____ Days _____ Weeks _____ Months _____ Years

[SKIP TO Q. 29]

27. About how long were you riding the bus to work?
    _____ Days _____ Weeks _____ Months _____ Years

28. About how many days per week were you riding the bus to work?
    _____ (Enter 0 if question is skipped)

29. Is there any other way you used to get to work since you received the information?
   1- Yes          2 - No (Go to END)         9- Don’t Know/refused

30. And how were you getting to work? (Specify___________)

31. And are you still getting to work by (INSERT ANSWER TO Q. 30)?
   1- Yes          2 - No (Skip to Q.34)         9- Don’t Know/refused

32. About how many days per week are you (INSERT ANSWER TO Q. 30)?
    _____ (Enter 0 if question is skipped)

33. About how long have you been (INSERT ANSWER TO Q. 30)?
    _____ Days _____ Weeks _____ Months _____ Years

[GO TO END]

34. About how long were you getting to work by (INSERT ANSWER TO Q. 30)?
    _____ Days _____ Weeks _____ Months _____ Years

35. About how many days per week were you getting to work by (INSERT ANSWER TO Q. 30)?
    _____ (Enter 0 if question is skipped)

END  Thank you very much for your cooperation in this survey. Good night.
APPENDIX B

Sample Completed Rideshare Database Survey
Good evening. My name is ____________ and I am with ____________, a market research company. This evening we are conducting a short survey on commuting in the (Insert area name here) area. We are not attempting to sell you anything, we are only interested in your opinions.

(Ask to speak to person named on sample sheet - repeat intro if necessary)

1. How many days per week do you commute to work?
   __5__ (if 0 TERMINATE)

2. And about how far is your commute to work, in miles? __10__

3. Have you ever heard of (Insert name of ridesharing organization here)?
   1- Yes  
   2- No (Go to END)  
   9- Don't Know/Refused

4. Have you ever contacted (Insert name of ridesharing organization here) for carpool or vanpool information, or not?
   1- Yes  
   2- No (Go to END)  
   9- Don't Know/refused

5. Did (Insert name of ridesharing organization here) provide you with carpool, vanpool, or transit information or assistance, or not?
   1- Yes  
   2- No (Go to END)  
   9- Don't Know/refused

6. To what extent did the information or assistance provided by (Insert name of ridesharing organization here) influence the way you commute to work? Did it:
   1- Have a great deal of influence  
   2- Have a moderate influence  
   3- Have a slight influence  
   4- or have no influence at all

7. Did you ever carpool after you received the information, or not?
   1- Yes  
   2- No (Skip to Q. 15)  
   9- Don't Know/refused

8. Are you still carpooling to work?
   1- Yes  
   2- No (Skip to Q. 12)  
   9- Don't Know/refused

9. About how many days per week are you carpooling?
   __0__ (Enter 0 if question is skipped) (SKIPPED)

10. About how many people are usually in your carpool, including the driver?
   __0__ (Enter 0 if question is skipped) (SKIPPED)
11. About how long have you been carpooling?
   ______ Days ______ Weeks _______ Months _______ Years

[SKIP TO Q. 15]

12. About how long were you in your carpool?
   ______ Days ______ Weeks _______ Months _______ Years

13. How many days per week were you carpooling?
   ____0____ (Enter 0 if question is skipped) (SKIPPED)

14. About how many people were usually in your carpool, including the driver?
   ____0____ (Enter 0 if question is skipped) (SKIPPED)

15. Did you ever vanpool to work after you received the information, or not?
   1- Yes  2- No (Skip to Q. 23)  9- Don’t Know/refused

16. Are you still vanpooling to work?
   1- Yes  2- No (Skip to Q. 20)  9- Don’t Know/refused

17. About how many days per week are you vanpooling?
   _____5____ (Enter 0 if question is skipped)

18. About how many people are usually in your vanpool, including the driver?
   _____8____ (Enter 0 if question is skipped)

19. About how long have you been vanpooling?
   ______ Days ______ Weeks _______ Months _______ Years

[SKIP TO Q. 22]

20. About how long were you in your vanpool?
   ______ Days ______ Weeks _______ Months _______ Years

21. How many days per week were you vanpooling?
   ____0____ (Enter 0 if question is skipped) (SKIPPED)

22. About how many people were usually in your vanpool, including the driver?
   ____0____ (Enter 0 if question is skipped) (SKIPPED)

23. Did you ever ride the bus to work after you received the information, or not?
   1- Yes  2- No (Skip to Q. 29)  9- Don’t Know/refused
24. Are you still riding the bus to work?
   1- Yes  2- No (Skip to Q.27)  9- Don’t Know/refused

25. About how many days per week are you riding the bus to work?
   _0___ (Enter 0 if question is skipped) (SKIPPED)

26. About how long have you been riding the bus to work?
   ______ Days ______ Weeks _______Months _______Years

[SKIP TO Q. 29]

27. About how long were you riding the bus to work?
   ______ Days ______ Weeks _______Months _______Years

28. About how many days per week were you riding the bus to work?
   _0___ (Enter 0 if question is skipped) (SKIPPED)

29. Is there any other way you used to get to work since you received the information?
   1- Yes  2- No (Go to END)  9- Don’t Know/refused

30. And how were you getting to work? (Specify ________________)

31. And are you still getting to work by (INSERT ANSWER TO Q. 30)?
   1- Yes  2- No (Skip to Q.34)  9- Don’t Know/refused

32. About how many days per week are you (INSERT ANSWER TO Q. 30)?
   _0___ (Enter 0 if question is skipped) (SKIPPED)

33. About how long have you been (INSERT ANSWER TO Q. 30)?
   ______ Days ______ Weeks _______Months _______Years

[GO TO END]

34. About how long were you getting to work by (INSERT ANSWER TO Q. 30)?
   ______ Days ______ Weeks _______Months _______Years

35. About how many days per week were you getting to work by (INSERT ANSWER TO Q. 30)?
   _0___ (Enter 0 if question is skipped) (SKIPPED)

END Thank you very much for your cooperation in this survey. Good night.
APPENDIX C

Commuter Assistance Program Procedures
COMMUTER ASSISTANCE PROGRAM

PURPOSE:

To establish procedures for the implementation of the Department's Commuter Assistance Program and develop a foundation for public/private partnerships to foster the delivery of employer-based transportation demand management (TDM) strategies.

AUTHORITY:

Chapters 187 and 341, Florida Statutes.

SCOPE:

The requirements or processes related to this procedure affect the State Public Transportation Office, District Public Transportation Offices and State Funded Programs.

DEFINITIONS:

Agency Annual Work Plan - An annual written plan submitted by agencies requesting state participation in local ridesharing projects or Transportation Management Associations/Transportation Management Organizations. This plan identifies project goals, objectives and related project information, and serves in evaluating project's progress.

Annual Survey - An annual survey administered by regional or local commuter assistance services. The survey is used to verify monitoring and reporting data.

Central Office - For the purposes of this procedure, the Department of Transportation, Public Transit Office and/or staff.

District Office - For the purposes of this procedure, the Department of Transportation, District Public Transportation Office and/or staff.
COMMUTER ASSISTANCE PROGRAM

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District Office - For the purposes of this procedure, the Department of Transportation, District Public Transportation Office and/or staff.
**Statewide Commuter Assistance Annual Report** - A report compiled by the Central Office detailing Commuter Assistance activities statewide. This report will include all the data and monitoring compliance figures provided by the projects to the District offices. This report will be included in the Public Transit Report for the Transportation Commission.

**Telecommuting** - A work arrangement whereby selected employees are allowed to perform the normal duties and responsibilities of their positions through the use of computers or telecommunications, at home or an alternative worksite other than the employees’ usual place of work.

**Transportation Demand Management (TDM) strategies** - A set of measures designed to reduce the number of trips made by single occupant vehicles and enhance the regional mobility of all citizens. These strategies can include but are not limited to: traditional ridesharing (carpooling & vanpooling); encouragement and enhancement of public transportation, encouragement of alternative work hours (flextime, compressed work week, etc.), encouragement of non-motorized transportation (bicycle and pedestrian modes); development and implementation of shuttle services; encouragement of priority or preferential parking for ridesharing; encouragement, facilitation and distribution of discounted transit passes; fostering telecommuting programs.

**TDM Clearinghouse** - Is a service of the Department, currently operated by the Center for Urban Transportation Research, which provides technical support for the Department, local governments and emerging TMAs. Services include but are not limited to: strategic planning assistance, evaluations and survey assistance, training, TDM Resource Center and the TDM newsletter. The Central Office has monitoring and fiscal responsibilities for the clearinghouse. Requests will be coordinated through District office prior to approval.

**Transportation Management Associations/Transportation Management Organizations (TMAs/TMOs)** - The terms Transportation Management Associations or Transportation Management Organizations have been used interchangeably. For the purposes of this procedure the acronym TMA will be used. TMAs are public/private partnerships formed so that employers, developers, building owners, and government entities can work collectively to establish policies, programs and services to address local transportation problems. TMAs realize their potential in addressing traffic congestion, air quality, and in some instances, employment issues through the use of TDM strategies. TMAs are established within a limited geographical area to address the transportation management needs of their members. TMAs are expected to obtain private sector financing in addition to public funding.
GENERAL:

Coordinated use of existing transportation resources can provide a responsive, low cost alternative for alleviating urban highway congestion, improving air quality and thereby reducing the need for costly highway improvements. The commuter assistance program focuses on the single occupant commuter trip which is the greatest cause of peak hour highway congestion. A coordinated effort to provide alternatives to these commuters, using existing or low cost resources, can be beneficial to the development of public transit statewide and the Department’s priority efforts to relieve traffic congestion, improve air quality and to assure energy conservation. The State’s Commuter Assistance Program encourages a public/private partnership to provide brokerage services to employers and individuals for: carpools, vanpools, buspools, express bus service, subscription transit service, group taxi services, heavy and light rail and other systems which are designed to increase vehicle occupancy.

The program encourages the use of transportation demand management strategies including: employee trip reduction planning, Transportation Management Associations, alternative work hour programs, telecommuting, parking management, and bicycle and pedestrian programs.

PROGRAM MANAGEMENT AND IMPLEMENTATION

(1) CENTRAL OFFICE responsibilities shall include:

(a) Maintaining continuing communication with the District Offices on matters regarding the Commuter Assistance Program.

(b) Developing and maintaining program policies and procedures.

(c) Monitoring compliance with established procedures.

(d) Providing training and technical support to Districts and local programs as required.

(e) Staying current on national and international methods for promotion of commuter alternatives and transportation demand management, and providing this information to the Districts.

(f) Providing any necessary support for demonstration projects that are statewide or regional in scope or require staffing in excess of district capabilities.
(g) Assuring the coordination and implementation of support programs (Transit Corridor and Park and Ride).

(h) Compiling data provided by the District into Statewide Commuter Assistance Annual Report.

(i) Providing the latest transit trend and performance measurements.

(2) DISTRICT OFFICE responsibilities shall include:

(a) Maintaining communication with the Central Office on program status and implementation.

(b) Establishing and maintaining communications with local public and private organizations to advise them of the availability of Department financial and technical assistance programs for commuter assistance and transportation demand management.

(c) Establishing specific and achievable program objectives for the District based upon input from local and regional programs. The District Work Plan provides the framework and direction for the commuter assistance activities funded by the District.

(d) Assuring the provision of technical assistance in the development of commuter assistance services.

(e) Providing and managing grants to local agencies and the private sector for the implementation of Commuter Assistance Projects. This includes ensuring that grantees or contractors comply with JPA or contract requirements, and that requirements of this procedure are included in the JPA or contract.

(f) Ensuring that appropriate application of commuter alternatives further the development of public transportation projects in the Districts and the inclusion of private transportation providers.

(g) Performs quarterly review of each agency's progress to determine the effective implementation of the Agency Annual Work Plan. Modifications to the Agency Annual Work Plan will be documented.

(h) Prepares a District Quarterly Local or Regional Commuter Assistance Service Report summarizing each agencies progress in the implementation of the Agency
Annual Work Plans. The report will include the written quarterly reports submitted by the agencies detailing successes, mandatory reporting measures, problems and future plans. These reports are due in the Central Office by the end of the month immediately following the close of each calendar quarter. Reporting quarters are January - March, April - June, July - September, and October - December. Reports from established TMAs may be submitted twice annually at the end of the 2nd and 4th quarters.

(i) Participating, as appropriate, on the Boards of Directors of private non-profit TMAs and Regional Commuter Services Corporations.

(j) Development of Annual District Work Plan including project funding needs for the next five years. Assuring commitment of Department funds is consistent with the established production schedule.

(3) Issues not specifically mentioned in this procedure, nor with statewide implications, are left to the discretion of the individual District.

PROCEDURE

Commuter Assistance Projects shall be programmed by the Districts in coordination with the Central Office, the appropriate MPO, local agencies and the private sector to ensure statewide programming to optimize available funding sources.

(1) ELIGIBLE PROJECT COSTS

(a) Program administration and operational costs including: salaries, marketing materials, advertising, computerized matching, reporting and other project related costs.

(b) Computer hardware and software necessary to establish trip matching services, where not redundant or sharing could be a more efficient use of equipment.

(c) Specialized demonstration projects of statewide or regional impact designed to demonstrate innovative approaches to commuter assistance.

(d) Other capital purchases for the accomplishment of program objectives.
(e) Other operating expenses for the accomplishment of program objectives, such as a guaranteed Ride Home Project or vanpool administration.

(2) ELIGIBLE GRANT RECIPIENTS

Local governments or their designees including Metropolitan Planning Organizations, Regional Planning Councils, Transportation Authorities, or Community Transportation Coordinators designated pursuant to Chapter 427, Florida Statutes, are eligible recipients of matching grants.

Although funds may be used to administer these projects within local government, recipients should be encouraged to consider subcontracting services to the private sector. Grants may be made to private organizations pursuant to Chapter 617, Florida Statutes.

(3) FUND PARTICIPATION

(a) Funding for this program will be allocated to the Districts based on a statewide assessment of Commuter Assistance Program need. Allocation requests identified in the Annual District Work Plan will be given first priority.

(b) The Department is authorized to fund up to 100 percent of the eligible costs of commuter assistance projects which are determined by the District to be regional in scope and application or statewide in nature.

(c) The Department’s participation in a local project cannot exceed the amount of local participation.

(d) State funding participation in FTA funded projects shall be at the level defined in Chapter 341, Florida Statutes.

(e) The Department’s participation in Federal Highway Administration funded projects shall be at the levels required for the particular highway system fund involved according to Chapter 339.08(2), Florida Statutes.

(f) Specific match rates are identified in the Work Program Instructions.
(4) WORK PLANS

Each District shall develop an annual work plan for its District Commuter Assistance Program. This plan will detail program goals and objectives for the period October 1 through September 30. The district work plan shall identify annual program goals and emphasis areas, targets for regional and local commuter assistance services, and targets for TMAs. It will also include a five year funding needs projection. Plans shall be submitted to the Central Office by October 1 of each year.

(5) PROJECT TYPES

(a) Regional or Local Commuter Services operated by government agencies, transit operators or private contractors under contract to the Department shall be administered in the following manner:

1. Each agency shall submit an annual work plan consistent with Department and regional goals. The work plan will be incorporated as a "Special Consideration of the Department" in all JPAs, and shall include, at a minimum:

   a. an organization chart identifying all personnel funded by this project

   b. measurable program goals and objectives with milestones to determine progress in stated emphasis areas consistent with District work plans

   c. a marketing plan identifying market penetration and client service targets

   d. an annual project budget identifying expenses and revenues by source

2. All commuter assistance service agencies receiving state funding will be required to monitor and report to the District office the following data each calendar quarter:

   a. numbers of commuters requesting assistance

   b. number of commuters switched from single occupant vehicle

   c. number of vans in service (where applicable)
Definitions for each reporting category are provided in Attachment A.

3. Regional and local commuter assistance service programs shall administer an annual survey to collect and verify data for reporting requirements. This requirement may be waived by the District if the agency can show statistically accurate follow-up compiled in a monthly or quarterly manner. Requests to waive this requirement will be reviewed by the Central Office. Survey may be accomplished in-house or contracted out and must not have a sample error greater than 3% and a confidence level no less than 95%. Refer to survey guidelines in attachment A.

4. All projects shall be programmed in accordance with the latest Work Program Instructions and in compliance with the provisions of Chapter 341, Florida Statutes, as follows:

a. If the local eligible recipient has taken action to secure or designate federal funds as a funding source for a project, in which case the appropriate federal match ratio applies.

b. If the Central Office has indicated on a project-by-project basis that other funds (e.g., Transit Corridor) can be reasonably anticipated for the project, the appropriate match ratio associated with such funds shall apply.

c. If the project is regional in scope and no regional financing mechanism exists, the project is eligible to be programmed up to 100% state participation.
(b) Transportation Management Associations operated as public/private partnerships:

1. Funding may be provided to TMAs organized as private non-profit corporations, in cooperation with local government, that are established according to local comprehensive plans, other locally adopted plans or regional commuter assistance program goals.

2. State start-up funds may be granted in the following ratio: 50% - first year, 40% - second year, 30% - third year, fourth year or longer - TMAs will be eligible for continued funding at the lesser of $50,000 or 25% of their total budget, provided they are meeting the performance criteria outlined in their existing JPA. Board member in-kind contributions may count toward local match requirements. However, in-kind contributions must have the prior approval of the District Office. Districts may use 49 CFR 18.24 et seq. as guidance in determining allowable in-kind contributions. Variation from these levels is permitted with prior consultation with the Central Office.

3. Grants supporting TMAs may be made directly to the incorporated organization or to the appropriate local governmental agency for pass-through to the TMA following the current JPA procedure. TMAs receiving these grants shall include the Department as an ex officio member of its Board of Directors during the period of the grant.

4. To be eligible for state funding a TMA must provide the Department with a detailed Agency Annual Work Plan, articles of incorporation as a private not for profit body, bylaws, geographical boundaries, trip management goals, a financing plan, an institutional structure, and potential membership estimates. Future year work plans will be required. A TMA shall utilize the Department’s TMA Self Evaluation program on an annual basis. Results of the evaluation will be reported to the District office annually. Records of services received from regional commuter assistance program should be maintained. A summary of these activities shall be included with the quarterly reports provided to the District office. The District will determine information requirements for the quarterly reports.
5. No TMA will be funded unless its Agency Annual Work Plan has been approved by the District office as consistent with regional commuter assistance program plans, MPO transportation plans, local comprehensive plans and regional strategic policy plans.

6. Funds granted to TMAs under this program are for administrative, planning, marketing and operational purposes only. The Department will not participate in the acquisition of computerized ride matching capabilities unless this service is not available through a regional or local commuter assistance program.

7. Special projects and operations (shuttles, vanpools, guaranteed ride home programs, transit discounts, etc.) may be funded on a 50% state ratio to established TMAs (over three years old).

(6) PROJECT FILES

The District shall maintain the official project files, which at a minimum, shall include or have readily accessible:

(a) All Joint Participation Agreements and/or Contracts and a copy of any amendments or supplements thereto.

(b) A copy of each invoice presented for payment.

(c) Quarterly reports from the grant/contract recipient.

(d) Documentation of District quarterly on-site visits and annual evaluations.

(e) An inventory of all capital acquisitions including description, state participation, current location, and cost when acquired.

(f) All pertinent correspondence regarding the project.

(g) A copy of the agency annual audit (report) performed in accordance with the Public Transportation JPA Procedure, No. 725-000-005, and Recipient/Subrecipient Single Audit Procedure, No. 450-021-001.
(7) TRAINING

The basic TDM training is mandatory for all Department CAP managers and CAP agency directors. Additionally, the State Commuter Assistance Office periodically offers training classes which provide the most recent technical assistance and program information available.

(8) FORM ACCESS:

There are no required forms associated with this procedure.
ATTACHMENT A

EVALUATION MEASURE DEFINITIONS

**Number of Commuters requesting assistance**
This is the number of people that request assistance of some sort including:
- Carpool matchlist
- Vanpool matchlist or formation assistance
- Transit route and/or schedule information
- Telecommuting information
- Bicycle route and/or locker/rack information

**Number of commuters switching modes**
This is the number of people that actually use the information you provide to change from their current SOV mode to carpooling, vanpooling, transit use, telecommuting, walking and/or bicycling.

This information can be gathered by doing sample survey of commuters assisted on a monthly basis by either phone or mail. Every month contact a random sample of the commuters assisted the previous month to see how many actually used the information you provided. Extrapolate survey results to estimate total. It is recommended that actual data be used where available.

**Number of vans in service (where applicable)**
Report the number of commuter vans on the road and/or the number of vanpoolers.

**Number of vehicle trips eliminated**
Using the follow-up survey data or actual data multiply the frequency of alternative mode use by the estimated number of commuters using a shared mode or telecommuting.

**Vehicle miles eliminated**
Using follow-up survey data take the average trip length times the frequency of use times the number of formations.
**Employer contacts**

When reporting include the number of employees at each site.

Report number of employer contacts by the following categories:
- Number contacted by letter/fax
- Number contacted by phone
- Number contacted in person
- Number of follow-up calls or visits

**Major Accomplishments**

- New Transit Services Initiated/Improved
- Education Programs Initiated
- Transportation Planning Initiatives
- Guaranteed Ride Home Projects Initiated
- Other Implementation Activities

**Parking spots saved/parking needs reduced**

Determined by the number of people using alternative modes at each employment site.

**Commuter Costs Saved**

Multiply vehicle mile eliminated by the average cost per mile. AAA is a good source for the average cost per mile.
DISTRICT OPTIONAL EVALUATION MEASURE DEFINITIONS

Gasoline Saved
Multiply vehicle miles eliminated by the average miles per gallon figure from AAA.

Emissions Reduction
Multiply vehicle miles eliminated by the emission factors for your area. Emission factors are available from Department of Environmental Protection.

Information Materials Distributed
Categories may include but are not limited to:
- Brochures
- Information packets
- Posters
- Surveys

Special Events
Categories may include but are not limited to:
- Transportation Days
- Commuter Fairs
- Special Promotions

Media/Community Relations
Categories may include but are not limited to:
- Number of PSAs shown
- Number of newspaper articles
- Number of news stories
- Number of magazine articles
SURVEY GUIDELINES

This is meant to be a guide for agencies choosing to administer an in-house, annual survey.

Probability Samples
Probability samples are those in which everyone has an equal chance or probability of being chosen. The assumption is that the people who are selected are believed to be just like those who are not. Types of techniques associated with probability sampling include: simple random sampling, stratified random sampling and simple random cluster sampling.

Sample Size
Once the sampling methodology has been decided upon, a sample size may be determined. Three issues must be addressed when determining sample size: sampling error (the degree of precision desire), stratification (the examination of subsegments of the population), and confidence levels (the degree of certainty with which the sample is representative of the population).

Sampling Error
The degree of precision in a survey sample can be determined by calculating the standard error. Specifically, as the sample size increases, the standard error associated with that sample decreases. The issue of precision with a survey sample is an important one.

Stratification
In stratified sampling, the surveyor draws a sample with a pattern of important characteristics that is the same as the population’s. If 80 percent of employees in the target area drive alone to work while 10 percent carpool, then the sample should have the same distribution of modes.

Confidence Levels
The confidence level indicates the degree to which the researcher is confident that the sample is representative. Frequently, the 95 percent confidence level is chosen, meaning that there is a 95 percent chance that the sample and the population will look alike, and a 5 percent chance that it will not.
Example
The following example illustrates the process of determining sample size. Suppose a new TMA wants to determine mode split for employees in its area. Census data for the region suggests that the carpool rate is 15 percent. The confidence level was chosen to be 95 percent and the standard error 2.5 percent. The following equation is used:

\[ N = \frac{(p)(1-p)}{(te/z)^2} \]

- \( N \) = unadjusted sample size
- \( p \) = estimated proportion or incidence of cases
- \( te \) = tolerable error
- \( z \) = the standard score of a given confidence level

A new statistic used in this calculation is “tolerable error” (te), which is defined as the standard error times the t-statistic (1.96 for a 95 percent confidence interval). Given that \( p = 0.15, z = 1.96, \) and the standard error = 0.025, \( te = 0.05. \) Thus:

\[ N = \frac{(0.15)(1-0.15)}{(0.05/1.96)^2} \]
\[ N = 196 \]

To adjust for the population, the following equation is used:

\[ N' = \frac{N}{1+(N/P)} \]

- \( N' \) = adjusted sample size
- \( N \) = initial sample size (calculated above)
- \( P \) = target population

For this scenario, if the target population in the study area is 5,000, then:

\[ N' = \frac{196}{1+(196/5000)} \]
\[ N' = 188 \]

Finally, the sample size is determined by accounting for anticipated sample size. Many researchers report results with a 30 percent response rate. Therefore, this example will also anticipate the same.

\[ N = N'/X \]

- \( n \) = final sample size
- \( N' \) = adjusted sample size
- \( X \) = anticipated response rate
Given this equation, the final sample size for this example is:
\[ n = \frac{188}{0.30} \]
\[ n = 629 \]

Therefore, in order to determine mode split for its area, the new TMA must distribute 629 surveys to employees of its members. If the TMA is using the simple random sampling technique it would randomly choose 629 names from its database. However, if the TMA wants to use the stratified random sampling technique, the above process should be repeated for each organization. This will allow the TMA to construct a profile of each employer in its area that is statistically significant, and will ensure a statistically significant sample for the entire region as well.
EVALUATION MEASURE REPORTING GUIDANCE

This is an example of how an agency could go about compiling the data needed for the reports they are required to submit to the Department. This is meant to be an example, not a prescribed format. However, calculations must be based on known real data and mathematically correct. In our example the agency will be called ICAP (Imaginary Commuter Assistance Program).

Number of commuters requesting assistance
ICAP reports the following for Month X:

- 100 carpool matchlists processed
- 5 new vanpool clients

Number of commuters switching modes
ICAP sends mail back cards to all 100 clients requesting carpool matchlists. All the information needed from the vanpoolers is available in their fare payment and registration records.

25 mail back cards are returned by carpoolers with 5 clients reporting that they are carpooling.

\[ \frac{5}{100} = 5\% \]

Phone calls are made to the remaining 75 carpool clients. Of those ICAP reaches 30 and finds out 5 more clients are carpooling.

\[ \frac{5 + 5}{100} = 10\% \]

Number of vans in service
ICAP has 20 vans currently in service.

Number of vehicle trips eliminated
The average frequency of carpooling reported on the mailback cards was 3 days a week. The frequency of the vanpoolers is 5 days a week.

\[ 10 \times 3 \times 2 = 60 \text{ trips eliminated by carpoolers/week} \]
\[ 5 \times 5 \times 2 = 50 \text{ trips eliminated by vanpoolers/week} \]

Vehicle miles eliminated
The average carpool trip distance is 10 miles one way. The average vanpool distance is 35 miles one way.
10 x 60 = 600 miles eliminated/week
35 x 50 = 1,750 miles eliminated/week

To get the total number eliminated for the report, multiply by the number of weeks in the report.

**Employer contacts**
ICAP reports the following contacts:
- 13 employers contacted by letter
- 10 employers contacted by phone
- 5 employers visited in person

**Major accomplishments**
ICAP expanded the guaranteed ride home program to include 3 new employers.

**Parking spots saved/parking needs reduced**
15 spots saved this month

**Commuter costs saved**
The AAA average cost per mile for ICAP’s service region is $.40.

$.40 x 600 = $240.00 saved/week by carpoolers
$.40 x 1,750 = $700.00 saved/week by vanpoolers
QUARTERLY REPORT
FOR
JANUARY 1, 1997 - MARCH 31, 1997

I. INTRODUCTION/BACKGROUND

II. GOALS AND OBJECTIVES MET

III. ACTIVITIES/DOCUMENTATION

IV. MEASURABLE GOALS/OTHER STATISTICS
IV. MEASURABLE GOALS/OTHER STATISTICS

<table>
<thead>
<tr>
<th>MONTHS REPORTED</th>
<th># OF COMMUTERS REQUESTING ASSISTANCE</th>
<th># OF COMMUTERS SWITCHED FROM SOV</th>
<th># OF VANS IN SERVICE (IF APPLICABLE)</th>
<th># OF VEHICLE TRIPS ELIMINATED</th>
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<th># OF EMPLOYER CONTACTS &amp; PARTICIPATION</th>
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-TOTALS-

COMPARISON TO LAST REPORTING PERIOD:

(REPORT INCREASES/DECREASES WITH EXPLANATIONS)