

HOW TO CONDUCT AN

MSW SERVICES SURVEY





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HOW CAN AN MSW SURVEY HELP YOUR COMMUNITY?

Your community may be one of the many rural areas in Texas that is battling the problem of the illegal dumping of household garbage. If so, a municipal solid waste survey is a powerful tool to help you learn what options for solving this problem will best serve your community.

Why Illegal Dumping Is a Problem for Your Community

The illegal dumping of household wastes has become one of the most challenging public health and safety problems confronting leaders of Texas rural communities today. Before the 1990s, the collection and disposal of household wastes had been fairly convenient and inexpensive for rural communities because most areas had easy access to landfills, and competition among those landfills helped to keep tipping fees low.

However, in the early 1990s, in response to rising public health and environmental concerns surrounding inappropriate landfill operations, the U.S. Environmental Protection Agency promulgated new regulations for upgrading the design, operation, and closure of municipal solid waste¹ (MSW) landfills. Complying with these regulations proved to be too costly for many rural landfills. Many were forced to close.

Not surprisingly, as these landfills closed, disposing of household garbage became less convenient and more expensive for rural residents, and illegal dumping increased as a result.

Solving Illegal Dumping in Your Community

Fortunately, Texas communities have found many different affordable ways to solve rural residential solid waste management problems. For example, in some cases two or more rural communities have combined their resources to fund and operate regional transfer stations, landfills, and recycling facilities.

Other communities have used public-private partnerships to create affordable and convenient rural garbage collection and disposal services. For example, local governments have contracted for collection, hauling, or disposal services.

A more recent innovation is the use of citizens' collection stations (CCSs). CCSs are simply conveniently located places where rural residents can drop off their trash at certain times of the day. These stations typically feature one or more moveable trailers, Dumpsters, or roll-off bins to temporarily store and then transport the collected waste to a landfill or transfer station.

To explore whether a CCS program is feasible for your community, read *How to Plan, Design, and Finance Citizens' Collection Stations* (TNRCC publication GI-249).

Using This How-to Manual

The Texas Natural Resource Conservation Commission (TNRCC) developed this manual to help rural Texas communities plan and evaluate new options for MSW collection and disposal. Because each Texas rural community is unique in many important ways—and because the public can be very unforgiving when a public service fails—you need to have accurate and timely information as you plan new MSW services.

With this manual, the right survey leader, and a random number table (or a calculator that will generate random numbers), in 10 steps you can complete a survey that should tell you all you need to know about these topics:

- what services your community needs now
- how much residents are willing to pay for these services

¹ Because state law carefully defines the types of waste these landfills may accept, we will use the term "municipal solid waste" to refer to these landfills in this document. But when we refer to MSW itself, we will use a more familiar term—"household garbage." Through this choice of terms, we're making your reading easier, but we're **not** saying that everything anyone chooses to put in their household garbage is automatically MSW.

- how you can best configure these services to meet your residents' needs

You can find a random number table in the back of most college-level statistics textbooks, including any of the references mentioned under "Where to Learn More." Under "Pick a Good Leader" on page 3, you can find out who you should look for to make sure your survey works well.

In these 10 steps, we give you the background you need to make your own decisions about issues to study, questions to ask, and the survey method to use. However, for the sake of keeping the process simple, we have made assumptions about acceptable values for the margin of error and level of confidence (see page 12). These assumptions are valid for most community planning surveys.

In making these assumptions, we have spared you a few tedious calculations, a longer discussion of statistical methods, and perhaps even the concern that you made the wrong choice for a very confusing survey parameter. We hope that you will find this manual to be a recipe for success, not a formula for frustration.

Where to Learn More

Several easy-to-read texts on survey research, design, and administration can teach you about survey methods in more depth and breadth than we could hope to achieve in this how-to manual. These are a few of the better references available:

How to Conduct Your Own Survey (1994) by Priscilla Salant and Don A. Dillman. John Wiley and Sons, Inc., New York—This is the best overall reference. Don't be intimidated by its thickness. It's easy to read, even if this topic is new to you.

How to Conduct a Citizen Survey (1987) by Therese van Houten and Harry P. Hatry. American Planning Association, Chicago—This is a short and very good overview of how to conduct these surveys.

Survey Research Methods, Volume 1, Applied Social Research Methods Series (1988) by Floyd J. Fowler, Jr. Sage Publications, Inc., Newbury Park, CA—This reference is strong from the standpoint of survey sampling, but may be too technical if you have not already studied surveying methods.

You should be able to find these texts through your community library or an interlibrary loan.

STEP 1:

ORGANIZE YOUR MSW SURVEY TEAM

When properly planned and executed, an MSW survey can offer timely and accurate information to help your local government decide how to provide MSW services. But an MSW survey can also be an exercise in frustration and wasted expense when inadequate planning leads to a poorly developed and executed survey that leaves the community questioning the survey results. To ensure success, you must systematically plan and carry out your MSW survey.

Pick Your Planning Team

The first step to ensure that your survey meets the needs of your community and produces valid and useful information is to organize a survey planning committee. This committee should include the likely users of the data—for example, the health department, the public works department, the city manager, and elected officials—as well as representatives of the citizens who are likely to be affected by the decisions made.

For example, you might assign your MSW survey to one or more of these groups:

- a local government administrator and staff
- a citizens' advisory council
- an interim task force

Regardless of the approach you take, it is important to emphasize that an open, public process is critical to maintain credibility and to obtain survey results that participants can consider to be valid.

Pick a Good Leader

To make sure your community's survey is successful, you must have someone who has a basic understanding of survey questionnaire design, survey sampling, and basic statistical analysis to lead the project. This person will manage the actual development and execution of the survey.

For example, a college graduate who has completed an advanced course in statistics could

fill this need, working with this manual and one of the textbooks mentioned on page 2. If no one available to your community has this experience, seek qualified individuals or firms to help design your survey. Often your regional council of governments (COG) coordinator can help you find qualified statistical help.

A variety of individuals may be able to help your community at little or no cost:

- Many agricultural extension agents have training in survey research and statistics.
- Market research firms may be willing to volunteer their knowledge and skills in survey research as a community service.
- Most universities, colleges, and community colleges have faculty or researchers with appropriate training who may be willing to either contract as consultants or conduct the survey as part of a class project.
- Public service organizations such as the United Way, the League of Women Voters, and leadership development programs often have qualified individuals who can assist in survey research as well.
- Help may also be available from staff at regional offices of state agencies—for example, the TNRCC, the Texas Department of Transportation, and the Texas Department of Housing and Community Affairs—or from your regional COG.

Depending on the resources and expertise available to your community in house or through volunteer services, you have three options for using outside help:

- Contract an expert to review the design, sampling plan, and implementation steps for what will largely be an in-house survey project.
- Contract for certain aspects of the survey where in-house expertise is lacking—for example, in drawing a representative sample.

- Contract out the entire survey project and have your survey planning committee provide only an oversight role.

If you use one of these contracting options, write strict provisions for quality control into the

contract to ensure adequate survey planning and administration. See “Administer the Questionnaire” on page 33 and “Code the Surveys” on page 35 for examples of these provisions.

Starr County’s Experience With ...

GETTING STARTED

A local community nonprofit organization, Colonias Unidas, and a Starr County commissioner were interested in exploring affordable MSW services options for residents of three colonias. They were especially interested in establishing a citizens’ collection station program to help residents dispose of their garbage affordably, conveniently, and safely. They wanted to find out whether colonia residents were interested in using CCSs and, if so, whether a CCS program would be feasible.

In 1998, Colonias Unidas and the commissioner contacted the TNRCC for technical assistance. With the help of the TNRCC and its research contractors, they developed a survey to explore the CCS option and other MSW issues for Starr County.

In the appendixes to this manual, we provide a master copy of the Starr County survey: Appendix A in English, and Appendix B in Spanish. We encourage your community to adapt this model survey to meet your own needs.

STEP 2:

IDENTIFY YOUR INFORMATION NEEDS

Perhaps the most important part of preparing for a community MSW services survey is carefully considering these questions:

- What do we want to know?
- Who do we need to ask?

Because surveys can be time-consuming, labor-intensive and, at times, costly, your planning team must develop a clear picture of what the community wants to learn from the survey. The usual range of questions covers these issues:

- assessing current household garbage disposal practices, beliefs, and services;
- assessing resident preferences about possible future service options;
- assessing service delivery approaches, locations, fees, and scheduling that would make garbage disposal service effective for the community.

What Do You Need to Know?

MSW surveys usually cover both subjective and objective information from households to assist in the MSW planning process.

Subjective Information

Useful subjective information includes:

- *Perceptions and beliefs about MSW needs and problems*—for example, is illegal dumping a problem in rural areas? Are MSW service options too limited in unincorporated areas?
- *Desires regarding MSW service*—for example, do residents expect to be able to drop off trash at minimal cost without driving too far?
- *Preferences about different service options*—for example, would residents prefer a regional transfer station to a citizens' collection station? Also, is there a preferred location for a citizens' collection station within the community?

- *Degree of satisfaction with current service*—for example, are residents pleased with existing curbside collection services? Are they happy with current efforts to control illegal dumping?
- *Intentions about MSW services*—for example, would households intend to drop curbside collection service and make use of a new citizens' collection station?

Objective Information

You can also collect useful objective information from an MSW survey—information about prior MSW experience, current MSW practices, and current household characteristics. For example, you may find this objective information useful:

- prior experience with a citizens' collection station or regional transfer station;
- prior experience with recycling or composting;
- current amount of garbage created by a household;
- current household waste separation, composting, and recycling practices;
- current household garbage collection and disposal practices;
- current amount households pay for MSW collection and disposal service;
- current household garbage service provider;
- amount of time lived in a household and typical times of year not at home—especially for migrant workers and vacationers;
- main language spoken and read in the household;
- household size and number of children and adults;
- household transportation options—that is, whether they have a car or truck to move garbage;
- household income level.

Who Do You Need to Ask These Survey Questions?

The second key issue is deciding where—and from whom—to get the information you need. Do you need information for the entire community? Or just from certain parts of the community where curbside commercial service is either unavailable or very expensive? Or should the MSW survey also cover residential areas in adjacent rural counties that

Starr County's Experience With ...

LISTING KEY ISSUES

In Starr County, TNRCC staff and county officials decided that they needed to develop survey questions to address these MSW service issues:

- How are residents currently disposing of their household garbage?
- How much are residents paying to dispose of household garbage?
- How much effort or time must residents use to dispose of their MSW?
- Are residents satisfied with the convenience and affordability of their current option to dispose of their household garbage?
- Would residents be willing to take their household garbage to a citizens' collection station?
- If so, what is the farthest residents would be willing to travel?
- How much would residents be willing to pay to use a citizens' collection station?
- Would residents be willing to go to local stores or offices to buy special bags to be used at the citizens' collection station?
- Are residents aware that it is illegal to dump their trash anywhere other than a legally authorized location?
- If so, does knowing this make them less likely to dump their trash illegally? Would an active enforcement program keep them from dumping?

might find your community's proposed new MSW service option more convenient than their own?

In another how-to manual, *How to Plan, Design, and Finance a Citizens' Collection Station* (TNRCC publication GI-249), we suggest a number of issues that your community might want to research before launching into an MSW survey. For example, you might want to find out what public agencies and private companies are already providing MSW collection and disposal services in or near your community.

What Areas Should You Survey?

The best way to determine what areas you should survey is to examine each issue your planning committee has raised, consider how well existing services in and near your community deal with that issue, and then ask yourself who would be affected—and how they would be affected—if your community addresses that issue.

For example, imagine that you face this situation:

- The southern fourth of your county is not receiving adequate garbage collection and disposal service.
- A preliminary inventory of businesses that provide curbside collection services shows that the cost of service is low elsewhere in the county.
- Very few residents of a nearby county might use a new rural MSW collection service within your county.

Under these circumstances, it would be safe to limit your survey to a sample of households drawn from the southern fourth of your county.

On the other hand, if your preliminary thinking and rough calculations suggest that you might have to use your county's general revenues to subsidize the new rural MSW service, then you might want to ask at least some questions to all county residents to find out how willing they are to pay for this new service.

In order to answer both questions well, it might be necessary to draw a sample for the county as a whole and to "oversample" the expected service zone in the southern fourth of the county. Step 4

(“Select the Survey Sample”; page 11) goes into greater detail on the technical considerations of drawing a sample for an MSW survey, but oversampling is too complicated for us to discuss in this how-to manual. If you think you need to use this technique, get the help of a professional statistical sampling service to draw your sample.

Who Do You Speak to When You Survey?

For an MSW survey, the answer to “Who do we ask?” is typically “households.” But who do you speak to if you intend to interview a household?

Generally, you should survey the head of the household. This person should respond to the questions on behalf of the entire household.

In some instances, you could consider extending the MSW survey to a specific subset of businesses that will have “MSW-type” waste streams—for example, small motels, bed and breakfasts, and small resorts. For these businesses, you may be able to use the same survey you use for households or to use a slightly modified version of that survey. For example, you might adjust answer categories to accommodate larger waste volumes or add a question concerning seasonal demands.

STEP 3:

SELECT THE APPROPRIATE SURVEY APPROACH

There are basically three options for conducting a survey: by telephone, by mail, or face to face. A variety of factors will influence your decision as to which survey approach to use.

Each survey approach has its own strengths and weaknesses that will vary with your circumstances and the type of data you need to collect. Here are points to consider as you decide which survey method your community should use.

Two Approaches—Better Than One?

In some cases, you may find it most appropriate to use a combined survey approach. For example, you may find out that about 90 percent of your community's residents have telephone service, but virtually all of the 10 percent who lack phone service live in two colonias.

In this instance, you could do a telephone survey for the county in general and a follow-up, face-to-face survey in the colonias. In this way, you would cover the county as a whole.

Telephone Surveys

In a telephone survey, interviewers call residents, ask questions from a written survey, and write down the answers given.

Telephone surveys will work best when:

- residents are very likely to have telephones;
- the survey needs to include a large geographic area, such as an entire county;
- households are dispersed over a large area;
- questions are straightforward and require no visual aids;
- technical assistance is available; and
- a quick turnaround time is necessary.

In some cases, a telephone survey can be completed a month after the questionnaire is ready.

Face-to-Face Surveys

In face-to-face surveying, interviewers go door to door to fill out questionnaires. By conducting the interview in person, the interviewer can use visual aids—for example, various sizes of trash bags—and can better “read” the respondents’ reactions. The interviewer can also objectively record information from field observation: Are there burn barrels in the front yards? Are there large piles of household garbage in the yard?

For areas where a significant portion of the population may not have a telephone, face-to-face interviews will reduce bias from not being able to reach houses without telephones.

In Texas border counties with colonias, face-to-face surveys will often be the preferred method. Face-to-face surveying takes into account the fact that many houses in colonias do not have individual addresses, do not have telephones, and may not be connected to municipal services such as water and sewer—and so will not appear in lists drawn from telephone listings or utility billing records.

Face-to-face surveys may be the best method in rural communities where:

- there is no reliable list of all residents;
- there are no street addresses;
- people may not respond willingly or accurately by telephone or mail;
- questionnaires are complex;
- the target population lives in a relatively small, contiguous area;
- qualified field supervisors and volunteers are available (to help keep survey costs down); and
- the area to be surveyed is considered to be safe for survey personnel to walk.

Mail Surveys

In a mail survey, you mail questionnaires to residents and ask them to answer the questions and

mail the survey back to you. Although mail surveys are relatively inexpensive, they have number of significant disadvantages.

For one thing, it is difficult to obtain a truly representative sample from a mail survey. The groups who respond to mail surveys tend to be

Starr County's Experience With ...

CHOOSING A SURVEY METHOD

In Starr County, the project team couldn't get reliable listings of all household addresses. They were also concerned that colonia residents would not respond willingly or accurately by telephone or mail.

Furthermore, some of Starr County's survey questions were complex and would require some oral elaboration and visual aids. There were also concerns that survey interviewers would need to serve both English- and Spanish-speaking households.

For these reasons—and because the three colonias comprised a relatively small, contiguous target area—the Starr County project team decided that the face-to-face survey was the logical approach to use.

more highly educated and have higher incomes than the community in general. Also, if many households in the community do not read English, it is difficult to send each household a survey in the language it understands best.

For another thing, a mail survey is not the best way to target households in a specific area if most households in your community have their mail delivered to a post office box.

Mail surveys are appropriate when:

- reliable mailing lists are available;
- respondents are likely to answer accurately and completely in writing;
- the community has limited funds to pay for the survey;
- an immediate turnaround is not necessary; and
- technical resources and interviewers are not available.

STEP 4:

SELECT THE SURVEY SAMPLE

Do you need to select a survey sample? Perhaps not. If your community is small enough—250 households or fewer—and you need very precise results, it may be most cost-effective to survey all the households in your target area. If so, you don't need to know about sampling techniques. Go to Step 5 (page 21) now!

On the other hand, if your community has more than about 250 households, sampling will probably save you money. The idea behind sampling is to get a reasonable estimate of your community's knowledge, opinions, or both without going to the time and expense of surveying the whole community.

If you can accept less-precise information, you can also use sampling for smaller populations.

Drawing a sample properly is critical to your survey's success. If your sample does not accurately represent your community, then you will not be able to draw any conclusions from your survey. You will know the opinions of the people who responded to your survey, but you won't know whether their opinions are representative of the community as a whole. If you have little or no experience with drawing a sample, see "Get Help or Go It Alone?" in the box on page 12 to learn more about affordable options for drawing your sample.

For example, beware of the temptation to use an informal sampling technique. Enclosing your survey in a utility bill mailing is a commonly used informal sampling technique. This informal approach has the advantage of allowing you to put your survey into every household in the community. However, with any informal sampling, you sacrifice control over one or both of these factors:

- *The size of your actual sample*—For example, typically no more than 20 percent of a utility's customers will complete and return a survey enclosed in their bill. In many cases, the response rate could be 5 percent or less. The number of responses you receive—not the number of surveys you mail out—is the size of your actual sample.

- *The groups represented by your sample*—Often, informal samples turn out to be "self-selected." In other words, you will get information from only the people who have decided to participate. Believe it or not, the group of people who take the time to read a bill insert, complete the survey, and mail it probably won't accurately represent your overall community. You need answers from all groups to the extent they are present in your community—not to the extent people in those groups choose to participate in your survey.

With formal sampling techniques, you control both of these factors and ensure the integrity of the information your survey produces. Formal sampling techniques involve these three basic steps:

- Develop a master list of households in your community.
- Based on the size of your master list, choose the best sample size.
- Choose the best sampling technique to draw the sample.

Develop a Master List

Any of a number of address records could serve as your master list. For example, these are a few of the sources you could use to obtain a master list:

- *A reverse telephone directory.* A reverse telephone directory lists addresses by street number rather than by the occupant's name. The reverse directory also tells whether the building is used as a business or residence.
- *Voting lists.*
- *Utility billing records.*
- *Motor vehicle registration records.*
- *A map showing all households in the community.*

You may be able to think of other sources as well. For the best master list, get lists from more than one source and combine them. By combining two or more different lists, you will pick up

households that don't appear on the first list you might have chosen.

For example, if you use utility billing records alone, your list won't include households in a mobile home park that does not have individual meters. But if you combine these utility billing records with a voting list and a telephone directory, your combined list will be more complete than any one of the original lists. Of course, when you combine different lists, you must comb through your new master list to delete multiple listings of all households that appeared on more than one of the original lists.

Choose the Best Sample Size

Three factors work together to determine how large a sample you need:

- the margin of error you can allow in your estimate
- the level of confidence you need in your estimate
- the likely response rate

Margin of Error

The margin of error is a measure of the possible difference between the results of your survey and your community's actual position on an issue. For example, here's how to interpret a margin of error of ± 5 percent:

- *Survey question:* "Is illegal dumping a problem in your neighborhood?"
- *Answer obtained:* Of the households you surveyed, 85 percent respond, "Yes."
- *Interpretation:* If you were to poll every household in the community, it is likely that 80 to 90 percent of the answers to this question would be, "Yes." (*How likely depends on your survey's level of confidence.*)

For most community surveys, a margin of error of ± 5 percent is acceptable. Generally speaking, the margin of error of your results improves—that is, grows smaller—as your sample size increases.

A small margin of error is especially important when you must use the results of your survey to predict participation rates, set user fees, and estimate your program's revenue stream.

Get Help or Go It Alone?

For many communities, the relatively simple sampling techniques described here will work just fine. However, if you need your survey to provide detailed information about a number of different small areas or groups in your community, then you are going to need a much more sophisticated sampling technique—especially if you intend to use a telephone or mail survey.

In this situation, you will need someone who is well-trained in statistical sampling techniques. If no one on your staff—and no volunteer available to you—meets this description, then it may be more cost-effective to hire a research or statistical consulting firm to draw the sample for you.

Many large consulting companies maintain and annually update computer databases for survey research. These databases make their sampling services quite affordable—for example, a truly random sample of 400 households in a community might run about \$200, including mailing labels and phone numbers.

In some cases, these firms will combine databases to provide a more complete listing of residences than your community could develop on its own.

For a telephone survey, a consulting firm might use random-digit dialing to sample all residents equally—even those with unlisted numbers.

By searching for "opinion research" on the Internet, you can find dozens of statistical and survey consulting firms that can help you with sample design. Consulting firms across the nation have access to the information needed to produce a valid sample for your community. You may be able to get excellent information quite cheaply, even if you work with a consultant whose office is in another state.

Level of Confidence

The level of confidence puts a number on how likely it is that your survey results are within the margin of error of the actual value. Most surveys use a sample that will give a 90 to 95 percent level of confidence that the survey estimate is within the margin of error of the actual value.

In the example we used to illustrate the meaning of “margin of error,” the level of confidence tells you how likely it is that the real value is between 80 and 90 percent—if the level of confidence is 95 percent, then chances are 95 out of 100 that the actual value is in that range.

To increase the value of the level of confidence for your survey results, you must increase the size of your sample. Table 4-1 (lower right) shows how large the sample must be to achieve a level of confidence of 95 percent. Here is how to use the information in Table 4-1:

1. Find out how many households you need to survey to achieve a 95 percent level of confidence. This number is the “target sample” for your survey. (You will find out how to use this value to calculate the number of households to survey—your “survey sample”—after we have discussed the likely response rate.)
2. After your survey is complete, do a “confidence check”—that is, compare the number of valid responses to the value of the target sample.
3. If the number of valid responses obtained is at least as large as the target sample, then consider your results to be valid with a 95 percent level of confidence and a 5 percent margin of error.
4. If the number of valid responses to your most critical questions—participation rates and user fees—is too small to provide this level of confidence, get the help of an expert consultant. Your expert consultant can help you figure out whether the level of confidence you actually achieved can support the decisions you need to make. If not, your expert consultant can help you repeat the survey in a way that will achieve the level of confidence you need.

Likely Response Rate

The response rate is a critical issue: If you need a sample size of 360 to achieve your desired margin of error and level of confidence, that means that you need 360 responses, not 360 potential

households to survey. You could obtain 360 responses from these and many other combinations of initial sample size and response rate:

Initial Sample	Response Rate (%)
400	90
480	75
720	50

You want the response rate to be as high as reasonably possible. A high response rate suggests that the opinions gathered reflect the views of the community as a whole. If you must survey 720 households to get 360 responses, then the results of your survey will not be as reliable as those of a survey of 400 households with a response rate of 90 percent.

To some extent, the response rate depends on the survey method you use. In the past, surveyors have been able to achieve these response rates when the survey was designed and administered well:

- *face-to-face surveys*: 80 to 90 percent
- *telephone surveys*: as high as 85 to 95 percent
- *mail surveys*: anywhere between 45 and 80 percent

Table 4-1.
Selecting a target sample for a 5% margin of error

Total Population	95% Confidence Level
100	80
250	152
500	217
750	254
1,000	278
2,500	333
5,000	357
10,000	370
25,000	378
50,000	381
100,000	383
1,000,000	384

Note: In this table, we make the conservative assumption that the community is evenly divided on at least one issue.

Source: *How to Conduct Your Own Survey*, by Priscilla Salant and Don A. Dillman, p. 55. John Wiley and Sons, New York, 1994.

But two recent developments are making it difficult to achieve these response rates for telephone and mail surveys. The first is Caller ID—many households no longer answer the phone if they don't recognize the number. The second is the high level of telephone sales pitches and junk mail. For these reasons, we strongly encourage you to use the face-to-face survey method.

Example 4-1 below will give you an idea of how to use these three factors to determine how large a sample you need.

Choose Your Sampling Technique

For your survey to give you statistically valid results, each household in your community must have an equal chance of being selected. Your sample will then neither ignore nor overrepresent

**Example 4-1:
How Large a Sample Do You Need?**

Survey Conditions	
Size of master list:	5000 households
Desired margin of error:	±5%
Desired confidence level:	95%
Survey method:	Face to face

Using Table 4-1, you can determine that your survey sample should be 357 households. Before drawing a sample, consider the impact of the likely response rate—with your face-to-face survey, you might obtain a response rate as low as 80 percent. To calculate the number of households you must survey to get at least 357 responses, you must divide that value by 80 percent, or 0.80:

$$357 \div 0.80 = 446.25 \leq 447$$

So, in this example, your initial sample would have to include at least 447 households to get the quality of information you want to get from your survey. We will use this number as the target sample as we illustrate the four relatively simple formal sampling techniques.

small groups in the community. In most cases, you will be able to get the representative sample you need with one of four relatively simple formal sampling techniques: simple random sampling, systematic sampling, cluster sampling, or two-step cluster sampling.

The sampling technique that will work best for you depends on the nature of your community, the survey method you intend to use, and the information you can get about households in your community. To select the best sampling technique for your community survey, consider these questions and the information in Table 4-2:

- Is your community fairly uniform but not too large—that is, fewer than 20,000 households, all located fairly close together? If so, then you can use *simple random sampling*.
- Is your community fairly uniform and rather large? If so, you can use *systematic sampling* to reduce expenses without increasing the margin of error.
- Does your community have two or three areas that are distinct from one another in terms of geography, cultural features, or other significant characteristics—for example, a suburban neighborhood and an RV (recreational vehicle) park or a colonia? If so, you will need to use either *cluster sampling* or *two-step cluster sampling* to make sure you draw a representative sample. Cluster sampling is also useful if you intend to use face-to-face surveys, even if your community is uniform.

If your community has more than three areas that are distinct from one another geographically, economically, or culturally, then you may need to use a more sophisticated sampling technique. The main question is whether one or more of these areas is likely to support its own separate position on one or more of your key survey issues. If so, get the help of an expert in statistical methods to select your sample. See “Get Help or Go It Alone?” on page 12 for ideas about where to find this help.

Simple Random Sampling

Simple random sampling is one of the most common sampling techniques. To use this technique,

Table 4-2.
Quick Guide to Selecting a Sampling Technique

If the best list you can get ...	Consider this technique ...	This technique works well when ...	Advantages	Disadvantages	Basic Procedure
<p>is not based on a map of your community...</p> <p><i>(Example: driver's license list + utility billing records + voting list)</i></p>	Simple random sampling	<p>The master list is 20,000 households or fewer and you plan to survey by:</p> <ul style="list-style-type: none"> ■ mail –or– ■ telephone 	<ul style="list-style-type: none"> ■ Truly random ■ Sample is likely to be representative of community as a whole 	<ul style="list-style-type: none"> ■ Households selected will be scattered randomly throughout the community ■ Small, well-defined groups may be over- or underrepresented in your sample ■ Time-consuming 	<ol style="list-style-type: none"> 1. Number the list in sequence (1, 2, 3 ...). 2. Generate a set of random numbers — as many as you need in your sample. 3. Survey each household whose number appears in this random set.
	Systematic sampling (See page 16 for details.)	<p>The master list is more than 20,000 households and you plan to survey by:</p> <ul style="list-style-type: none"> ■ mail –or– ■ telephone 	<ul style="list-style-type: none"> ■ Faster than simple random sampling when the group is very large ■ Margin of error of results is similar to that of simple random sampling 	<ul style="list-style-type: none"> ■ Households selected will be scattered randomly throughout the community ■ Small, well-defined groups may be over- or underrepresented in your sample 	<ol style="list-style-type: none"> 1. Number the list in sequence (1, 2, 3 ...). 2. Pick a random starting number and a count value. 3. The household that has your starting number is in your survey sample. 4. Starting with the next household, continue counting through the master list. 5. Each time you hit the count value, add that household to your survey sample and start counting again.
<p>is a map or is organized by location...</p> <p><i>(Example: reverse phone directory + utility service area map + designated blocks from last U.S. Census)</i></p>	Cluster sampling	You plan to do a face-to-face survey	<ul style="list-style-type: none"> ■ Sample includes blocks of consecutive households ■ May be able to use blocks already defined by U.S. Census Bureau 	<ul style="list-style-type: none"> ■ Area map must be current, or you must update it before sampling ■ If number of households varies widely from cluster to cluster, must weight results accordingly (get the help of an expert in statistical methods) 	<ol style="list-style-type: none"> 1. Divide map into blocks containing comparable numbers of households. 2. Using simple random sampling, draw the number of blocks you need to reach your survey sample.
	Two-step cluster sampling	You plan to do a face-to-face survey but also want to cover a wide area	<ul style="list-style-type: none"> ■ Although not consecutive, households surveyed are in closely packed clusters ■ Can sample more blocks, and therefore cover a wider area 	■ Same as above	<ol style="list-style-type: none"> 1. Divide map into blocks containing comparable numbers of households. 2. Using simple random sampling, draw the number of blocks you feel you need to cover a representative portion of your community. 3. Using simple random sampling, draw the same—or, with expert help, a properly weighted—number of households from each block.
	Multistage cluster –or– stratified sampling	You want specific information from each of several small areas or groups in your community	■ Enables you to get valid information for special small areas or groups	■ You need the help of an expert in statistical methods	Get the help of an expert for these sophisticated modifications of cluster sampling.

first you number the master list in sequence. In Example 4-1, you would number the households on the list from 1 to 5000.

Then, to draw a sample from your numbered list, use a computer statistical program or a random number table to generate a truly random set of as many different numbers as you would need in your sample. In the case of Example 4-1, you would generate 447 random numbers between 1 and 5000—for example, the result might begin, “923, 4987, 2, 15, 2138”

From your numbered master list, you then pick each household that corresponds to a number in this truly random set. This is the list of households you will actually survey.

You can find a random number table in the back of most introductory statistics textbooks. Again, don’t be tempted to take a shortcut by using an informal technique. Picking numbers by selecting them from a hat, by pointing at the list blindfolded, or by any other informal “random” technique does **not** produce a truly random set of numbers.

Systematic Sampling

Systematic sampling is basically a streamlined variation of simple random sampling and works well for larger populations. For communities of 20,000 households or more, these two techniques produce results with a similar margin of error, but systematic sampling is faster and easier—and therefore less expensive.

To use systematic sampling, you number the list in sequence, calculate a “count value,” and then draw the sample.

Calculating the Count Value

If we increase the population in Example 4-1 to 25,000 households, then we need a sample of 378 households to get the desired margin of error and level of confidence. (Check Table 4-1 and see if you agree.) Based on the likely response rate (80 percent), this means a survey sample of 473 households.

To calculate the count value, divide the total population by the size of the survey sample—in this case:

$$25,000 \div 473 = 52.9 \approx 53$$

This result tells you that your survey sample must include about one out of every 53 households from your master list.

Drawing the Sample

To draw the survey sample by systematic sampling, first use a random number table or a computer program to select a random number between 1 and your count value—in this case, between 1 and 53. Include the household that corresponds to this number in your master list in your survey sample. Then count through the list and add every 53rd household to the survey sample as in Example 4-2.

Of course, you can probably think of a number of shortcuts you can use to get to the final sample quickly without actually counting through the whole list. Regardless of whether your list is in hard copy or in a computer file, systematic sampling can make it easy for you to get from a large master list to a manageable survey sample very fast.

Cluster Sampling

Cluster sampling works best when you can easily define areas geographically and you would like to find out whether attitudes on key survey questions are different from one area to the next. As suggested in Table 4-3, cluster sampling is easiest to use when you have an up-to-date map that shows each household in your community.

Cluster sampling also enables you to use your resources more efficiently to gather representative information from each area. This efficiency can especially reduce costs for face-to-face surveys.

To carry out cluster sampling, you must divide each area of your community into smaller areas—or “geographic units”—that contain about the same number of households each. You will then randomly select enough of these blocks to get the total population you need for your survey sample.

Defining Geographic Units

As much as possible, the boundaries of your geographic units should follow roads, power lines, fences, and other natural boundaries to make it easier for your survey workers to recognize these

units. The U.S. Census Bureau’s “designated blocks” usually follow these boundaries and are often convenient geographic units for you to use in your survey.

To find the Census Bureau’s designated blocks from the most recent published census, look for the *U.S. Census of Population* at the nearest depository library. Your regional COG may also be able to help you identify census tract boundaries.

In rural areas, these blocks include about 9 to 12 residences. If you’re mapping your own

geographic units, this is a reasonable ballpark for the number of residences you should include in each unit.

Double-Check Your Maps!

The Census Bureau remaps its designated blocks for each census. If you are working with communities that are unmapped or have experienced rapid growth since the last census was done, you will have to map out these new developments and divide them into the appropriate blocks yourself.

If your community includes one or more colonias, chances are that you will have to produce or update maps yourself.

**Example 4-2.
Household Information**

No.	Phone No.	Count Value
1	555-1234	—
2	555-8788	—
3	555-2424	—
4	555-1875	0*
5	555-3488	1
6	555-2772	2
7	555-1888	3
55	555-4398	51
56	555-1771	52
57	555-9107	53*
58	555-2988	1
59	555-7529	2
109	555-5429	52
110	555-9445	53*
111	555-9017	1
163	555-9797	53*
216	555-4444	53*
269	555-3081	53*
322	555-2745	53*

* Include these households in your survey sample.

Drawing the Sample

The simplest way to draw a cluster sample is to prepare a numbered list of geographic units, determine how many of those units you need to include in your initial sample, and then use the technique described in “Simple Random Sampling” on page 14 to randomly select the number of units you need. Your survey sample will then consist of every household in the units selected at random.

For example, assume that you need an initial sample of 447 households because you are doing the survey as described in Example 4-1. If each of your units contains 12 households on average, then you need to divide the initial sample (447) by the average number of households per geographic unit (12) to determine how many units to survey:

$$447 \div 12 = 37.25 \leq 38$$

So you will need to select 38 geographic units and survey each household in each of those units.

Two-Step Cluster Sampling

If each of your geographic units contains many households, or if you want to cover more area, then you can use a two-step cluster sampling technique. In this technique, you randomly select a

SELECTING A SURVEY SAMPLE

Although Starr County's work group had the advice and assistance of their expert advisers, they still went through the three basic steps needed to formally select a survey sample—developing a master list, choosing the best sample size, and choosing the sampling technique. When the survey was complete, the work group did a confidence check as described on page 13 before they coded and evaluated the information.

The Master List

Recall that Starr County's target community was several colonias, where the number and location of households often changes quickly. To get a complete and up-to-date list of mailing addresses and even street addresses was impossible. As a result, the work group had to prepare a master list by mapping each colonia.

The Sample Size

From the total population of 650 households, the work group decided to draw a sample that would be appropriate for these conditions:

- ± 5 percent margin of error
- a 95 percent level of confidence
- a face-to-face survey (anticipated response rate of at least 80 percent)

Under these conditions, the work group needed to obtain a target sample of 256 households. Because the response rate of a face-to-face survey could be as low as 80 percent, the work group chose to draw a survey sample of 320 households.

The Sampling Technique

The work group then used a two-step cluster sampling technique to select the survey sample. Their purpose for using this technique was to keep travel time down while still covering a reasonably widespread area.

Before using this sampling technique, the work group prepared the maps by marking off clusters

containing about the same number of households each. Whenever possible, the cluster boundaries followed easily recognizable groupings—for example, city blocks. When this task was complete, the work group had identified 54 clusters with about 12 households each.

In the first step, the work group numbered the clusters from 1 to 54 and selected 40 of these clusters at random (with the help of a random number table).

To get 320 households from 40 clusters, the group needed to survey 8 households per cluster. So in the second step, the group numbered the households in each cluster (1 to 12 or so) and then selected 8 households at random (again, with the help of a random number table).

The Confidence Check

When the survey was complete, the work group discovered that the response rate was lower than expected, possibly because colonias change rapidly and so are very difficult to map accurately. They had obtained only 243 valid responses—too few to support a 95 percent level of confidence.

Fortunately, Starr County had one volunteer who was a statistical consultant in its work group. This volunteer was able to determine the actual level of confidence they had achieved and assure the work group that they had, in fact, obtained reasonably reliable results.

By selecting the sample for a higher level of confidence than was actually needed, the work group had provided themselves an extra margin of safety for obtaining valid results. When the response rate was only 76 percent instead of the anticipated 80 percent, this margin of safety kept them from having to repeat the survey.

With this reassurance that the survey results would be reliable, the work group began the steps of coding and analysis.

larger number of geographic units and then select a smaller number of households from each randomly selected unit.

For example, what if your 5,000 households occur as “geographic units” of 33 mobile home parks with about 150 households each? According to the simple cluster sampling technique we just described, your sample would include only three of these mobile home parks:

$$447 \div 150 = 2.98 \leq 3$$

To get a more widespread sample, you could select 30 households at random from each mobile home park, without going to the trouble to divide each mobile home park into smaller units. You would calculate the number of parks to use for your sample as follows:

$$447 \div 30 = 14.9 \leq 15$$

By this approach, you would select 15 mobile home parks at random and then draw 30 households from each of these mobile home parks.

STEP 5:

DESIGN THE SURVEY QUESTIONNAIRE

Now that you know who you will survey, the next step is to construct a questionnaire that addresses each of the key planning issues that your survey planning group outlined in Step 2.

For your convenience, we have printed the English version of the questionnaire used in Starr County in Appendix A with these ideas in mind:

- If Starr County's questionnaire covers all of the issues for your community, you can reproduce their survey for your own needs.
- If Starr County's questionnaire covers many of the issues for your community, you can localize it by adding, altering, or removing questions as needed. If you add your own questions, follow the guidelines in this chapter for their wording, organization, and format.
- Even if you can use none of Starr County's questions, you can use Appendix A as a model of the successful use of the principles we present in this chapter for wording, organizing, and formatting your questionnaire.

Regardless of which approach you use, be sure to read "Reviewing Your Questionnaire" on page 24 to find out how to do a final check of your questionnaire before the field pretest.

Wording Your Questions

To some extent, how you word your survey questions depends on how you plan to administer the survey—by mail, by telephone, or face to face. To design your survey questions well, follow the general rules listed in this chapter. You may also want to look in one of the textbooks mentioned on page 2 for other rules that are specific to your survey method.

Your three main concerns in wording each question in your survey are to hold the residents' interest as they complete the survey, to avoid confusion, and to keep the atmosphere friendly.

Keep Residents Interested

- Keep the wording simple—for example, not "household solid waste collection," but "trash pickup."
- Make sure your residents can finish the survey reasonably quickly. To keep from losing many residents, stay well within the rule-of-thumb time limits given under "Is the Survey Too Long?" on page 25.
- Don't ask residents to dig out old bills or to go to other great lengths to produce data. Keep your questions simple and convenient to answer.

How Long Should a Survey Be?

You might be able to think of hundreds of questions to ask about MSW services—but you shouldn't.

When a survey gets too long, the people you are surveying lose interest and stop responding. Many of them won't return mail surveys, may hang up on telephone surveys, and will grow restless in face-to-face surveys if the questions go on too long.

Before you include any question in your survey, test it for relevance by asking these three questions:

- Will the information collected from this question be useful in our planning and decision making?
- Can we get this information with the same validity in some other, less costly way?
- Is this information important enough for us to give it some of our limited space or survey time?

As best you can, keep the survey short by asking only one well-worded question about each issue you raised in Step 2.

Avoid Confusion

- Avoid jargon, acronyms, and other terms that would seem unfamiliar to most residents. Use plain language. For example, don't say "MSW" in a survey question; instead, say "household garbage."
- Whenever you can, make a list of all the possible responses so the surveyor can check off the answers the resident gives.
- Make sure the choices you provide for answers are mutually exclusive—for example, if the question is, "What is your household's monthly income?" then:

a bad set of answer choices would be:	a good set of answer choices would be:
\$500–1,000	\$500–\$1,000
\$1,000–1,500	\$1,001–\$1,500
\$1,500–\$2,000	\$1,501–\$2,000

- Keep the survey focused on today. In other words, don't ask residents how they felt about trash disposal service years ago, six months ago, or even last month. Instead, ask how they feel about the service they are receiving *now*.

Exception: If there has been a recent change in service, you may ask questions that are focused on that change—for example:

C1. Which of these best describes ABC Company's trash collection service last summer? (circle one)
very convenient
convenient
just okay
inconvenient
very inconvenient

- Use open-ended questions if they are absolutely necessary only. Even then, make

a list of the most likely responses so the surveyor can check them off and then add any less common responses received.

Keep the Atmosphere Friendly

- Keep the tone conversational. The best questions will sound as if you were speaking to your brother-in-law over the dinner table.
- Don't ask questions that residents won't understand. For example, if you must ask residents how they feel about regional transfer stations, then you must first explain what a regional transfer station is and how it operates.
- As much as possible, make your survey questions neutral and let the response categories determine the direction of the answer. For example, a good question-and-answer set would be:

B2. How would you rate the quality of your curbside trash collection service? (circle one)

excellent

good

average

fair

poor

Not:

B2. Is your curbside trash pickup service poor? (circle one)

yes

no

- Don't include questions that might make a resident uncomfortable, defensive, or resistant to answer. For example, don't ask, "How often have you dumped your garbage by the side of the road?" Instead, ask, "How often have you seen garbage being dumped by the side of the road?"

Translating Your Survey

If a significant portion of the population in your community speaks a language other than English—for example, Spanish or Vietnamese—then you should make the survey available in the language preferred by the resident.

If you have the survey translated, make sure that your translation is equivalent in meaning to the English version. One way to check for accuracy is to have a second translator convert the translation back into English.

The language used in the translation should be colloquial to the local population without being informal or using slang.

Before you administer the survey, review the translated and English versions side by side. Page numbering, headings, and questions should be consistent. In other words, the same questions should appear on the same pages in both versions, and both versions should have the same overall appearance.

For the Spanish version of Starr County's survey, see Appendix B.

Moving from a Draft to a Questionnaire

When you have completed your list of questions, you should organize it and format it to make the whole questionnaire as easy to understand as each of your questions.

Organizing Your Questionnaire

The way you group and number your questions must work well with the way you code your questions. Use these guidelines to produce a draft survey:

- Group related questions into their own section. For example, the questionnaire in Appendix A has all the questions about existing curbside service in Section 2. Questions intended for residents who have no curbside service are in Section 4.

- Keep each section short—no more than two pages. Start numbering questions again in each section—for example, number the first section A1, A2, A3 ... , number the second section B1, B2, B3 ... , and so on.
- In each section, put questions in a logical order when there is one. For example, within Section 6, "Citizens' Collection Stations," the questionnaire in Appendix A does not skip back and forth between questions about distance and questions about cost.
- Put questions that should raise the resident's interest in trash-disposal issues at the beginning of your survey. For example, Starr County's introductory questions targeted four highly interesting issues: health (children playing in garbage), nuisance (smoke or odors), volume (bags of trash per week), and cost.
- Put questions that the resident might consider to be either sensitive or trivial near the end of the survey. For example, your questions about household income, household size, and other demographic information will seem least threatening (or least annoying) if you put them at the end.
- Use "skip patterns" as little as possible—especially in mail surveys. (In a skip pattern, the survey might read, "If you answered 'yes' to this question, then go to page 14." The Starr County questionnaire has a number of these patterns, but was crafted carefully to keep that number low.)

Formatting Your Questionnaire

Good formatting is also a way to keep your survey questionnaire from becoming confusing. If you follow these basic rules, you should be able to produce a questionnaire format that reduces confusion regardless of the survey method.

- Use a clean, clear typeface—for example, 12 point Times New Roman.
- If you use boldface or italics in text (as opposed to headings), do so only sparingly.
- If you can, use space-and-a-half line spacing for a question and its answers.

- Between questions, use double spacing.
- Keep each question on the same page as all of its possible answers. In other words, don't jump to a new page in the middle of a question-and-answer set.

For specific formatting rules you should follow for your particular survey method, rely on the advice of your survey expert, or see Salant and Dillman's *How to Conduct Your Own Survey*, the first reference book mentioned on page 2.

Coding and the Organization of Your Survey

The way you have organized and numbered your survey questions should make it as easy as possible for your coding team to code the survey. Although we've put coding in Step 9 because you do that step near the end, the time to set up a coding scheme is now, as you are organizing the survey questionnaire.

For instructions on developing a coding scheme, see "Step 9: Code the Surveys" on page 35.

Reorganize your survey now if it would make it easier for your workers to code the responses.

Reviewing Your Questionnaire

When your survey questionnaire is ready, do several internal reviews. First, get the person who will code and analyze your survey results to review drafts of the survey. Your coder should help you make sure that your response categories and question wording will allow proper coding and analysis. Make any changes that your coder recommends.

Then do this preliminary pretest with your survey planning committee:

1. Have each committee member fill out the questionnaire.
2. After they have completed their questionnaires, get the committee together to discuss questions that worked well and questions that need improvement.
3. Make additional changes based on these results.
4. Using the committee's completed questionnaires, have the coder demonstrate how the coding and analysis will work.

Once you have completed these internal tests, you are ready to take your survey into the field for a pretest.

STEP 6:

FIELD PRETEST THE SURVEY QUESTIONNAIRE

By this time, your survey planning committee may be very eager to get the MSW survey out into the field without further delay. Avoid that temptation! By field testing your questionnaire first, you will catch and correct problems that no internal review process will pick up. In some cases, the field pretest will help you to fine-tune the wording of your survey questions.

How to Do a Field Pretest

To do a pretest, find five to ten households that are outside your survey area but are similar to your target population in all other ways. Have the head of each of these households complete the questionnaire. Observe their reactions to the survey in general as well as to each question. If you are also using a translated questionnaire, do a separate pretest with each version.

To get the information you need,

- **watch** the respondents as they complete the survey,
- **ask** them questions at the end of the survey, and
- **look** at any notes they made on the survey or answer sheet.

For example, if you are administering the survey by phone or face to face, do your pretest as a face-to-face-survey. If possible, have an observer present to record the respondent's reactions as the interviewer records the actual answers. When the interviewer and respondent have completed the questionnaire, the observer should ask respondent questions that cover the points listed in "What to Learn from Your Pretest."

On the other hand, if you plan to administer your survey by mail, then have the head of the household complete the survey in the presence of your observer. When the respondent is done with the survey, the observer should collect the written materials and cover the points listed in "What to Learn from Your Pretest."

When your pretest is done, add a fourth step to this process: *Amend* the questionnaire to fix any problems you identified in the pretest.

What to Learn from Your Pretest

In your pretest, the observer should look for answers to these questions:

1. Is the survey too long?
2. Is the survey simple to use?
3. Is any part of the questionnaire confusing?
4. Is any question too sensitive?
5. Are the answers adequate?
6. If you have translated the survey, is the translation clear and correct?
7. Does each question provide useful information?

In this section, we give you a few tips to pass on to your observers to help get answers to these questions.

Is the Survey Too Long?

Watch—Time each respondent as they complete the questionnaire. To avoid losing respondents before the questionnaire is complete, try to stay well within these limits:

- for a face-to-face interview, 30 to 45 minutes;
- for telephone interviews, 20 to 30 minutes;
- for a mail survey, 12 pages.

Also, watch for signs that the respondent is losing interest during the course of the survey. Do they grow listless and bored by the end of a face-to-face pretest? If they are working on a written questionnaire, are they working at a relaxed pace? Are they taking time to read each question and the full set of answers? Or does it seem that they are skimming the questionnaire to finish in a hurry?

Ask—Double-check your assumptions once the pretest is done. For example, you might ask the

respondent, “You seemed to be distracted towards the end of the survey. Did it seem too long?”

Look—If the respondent filled out the survey, examine the questionnaire and answer forms for evidence of attention lapses or hurrying. You may find comments in the margin—for example, “BO-RING!”—or a series of questions that are all answered the same way. For example, if the respondents checked the same box for every question in the survey, you might not be very confident that they actually read each question and responded thoughtfully.

Amend—If the pretest shows that your survey is too long, then you must remove or reword one or more questions. If the answer to a question does not give you information that is essential to your planning process, then don’t ask that question! See “Does Each Question Provide Useful Information” for more on this concept.

If respondents use the same answer too many times in a row, consider breaking up questions on the page. Also, see “Are All the Answers Adequate?” and consider whether you have provided a good range of answers.

Is the Survey Simple to Use?

Watch—Could the respondent (or the interviewer) easily recognize each new section? Did they have to flip back and forth between sections? Did they show other signs of frustration with the organization of the questionnaire?

Ask—Again, double-check your assumptions as soon as the pretest session is complete. For example, you could ask, “Do you think people will find this survey easy to use?”

Look—Did the respondent understand and correctly follow the “skip” patterns? Did they start to do a section before they realized it wasn’t intended for them?

Amend—Be sure you have followed the format tips given in “Formatting Your Questionnaire” on page 23. If your “skip” patterns are creating a problem, try to bring related questions closer together.

Is Any Part of the Questionnaire Confusing?

Watch—Did the respondent have to ask the interviewer to explain an instruction, question, or answer? Or did they imply with body language that they were confused—for example, by scratching their head or furrowing their brow?

Ask—Ask whether they found any part of the survey confusing. If so, ask them how they would reword that instruction, question, or answer to make it less confusing. (Their answer may not tell you the best way to word the question, but it will help you understand how they had misunderstood it.)

Look—Did they erase and change many of their answers? Did they mark the questionnaire to help themselves figure out what it meant?

Amend—If your questionnaire confused anyone in your pretest group, fix the problem now. For example, if you ask how much waste a household generates daily and the head of the household thinks of trash in terms of weekly volume, it could be that your reference to “each day” rather than “each week” is confusing. You could eliminate this confusion by modifying the question to allow the respondent to choose the time period (daily, weekly, or monthly) and then tell you the volume.

Make sure all parts of your questionnaire are easy to understand before you get ready to do the actual survey.

Is Any Question Too Sensitive?

Watch—Again, body language will reveal a great deal. Does the respondent show any signs of discomfort on hearing or reading the questions? Do they suddenly become reluctant to continue the survey?

Ask—At the end of the pretest session, ask the respondent, “Do you think people would feel uncomfortable answering any of the questions on this questionnaire?”

Look—In a written pretest, a respondent may write comments on the questionnaire to reveal their discomfort rather than confront you directly.

Amend—If you sense that the respondents are uncomfortable answering one or more questions in the pretest, consider rewording the question in a

less direct or less threatening way. For example, word questions about illegal dumping carefully to avoid giving the impression that you are accusing the respondent.

Are the Answers Adequate?

Watch—Are there questions the respondents could not answer with the choices given?

Ask—Ask the respondent whether the answer they wanted to give appeared on the questionnaire.

Look—Did any of your respondents add new answers in the margins? Did anyone try to mark more than one response for the same question?

Amend—Reword the question, its answers, or both. If you cannot easily add answers to fix the problem, you may need to develop two different questions.

Is the Translation Clear and Correct?

Watch—Do the respondents who receive the translated version become confused although those who receive the English version do not?

Ask—At the end of the pretest session, ask respondents if they noticed any problems with the wording of the questionnaire. Request suggestions for changing the wording to make it more understandable.

Look—As with the other issues you are studying in your pretest, respondents who work with a

written questionnaire may leave notes on the questionnaire or answer sheet that indicate problems with the translation.

Amend—Based on what you have learned in the pretest, work with your translator to improve the translation so it works for your target population.

Does Each Question Provide Useful Information?

Don't watch or ask—The only way to answer this question is to look at the answers obtained in the pretest.

Look—Examine the answers given for each question in your pretest. Do many respondents answer one question in particular with “Unsure,” “Other,” or some other catchall category? If so, this may be a wasted question—even if everyone answers it, the answers will tell you very little.

Amend—If you find that you have a wasted question, you have three choices:

- Drop the question.
- Reword the question.
- Develop a better set of answers.

When you have finished making these changes, proofread the revised questionnaire and prepare to administer the survey.

STEP 7:

MAKE YOUR FINAL PREPARATIONS

Before you can start administering the survey, you will need to complete the following tasks to ensure that the survey effort will go smoothly:

- devising a schedule and tracking system
- recruiting workers
- training them
- giving target areas advance notice
- planning field supervision

Think of each of these as part of your survey's quality control system. Having good quality controls will improve your survey response rate and help ensure that you obtain reliable data. Only after making these final preparations will you be ready to start the survey.

If you're doing the survey on your own, appoint a survey supervisor who will implement these measures. If you're contracting out the survey, make sure your contractor provides these measures.

Devising a Tracking System

You should create logs to track contact with each household that will be contacted and worksheets to establish a schedule for completing the survey. These logs must show what households will be contacted, the dates they were contacted, and which households completed the survey.

Your schedule will depend in part on how much time you have to complete the survey; for further information, see "How Many Workers Should We Recruit?"

As part of a scheduling and tracking system, you will need to establish procedures for following up on households that do not respond to the first survey.

Scheduling and Tracking Face-to-Face Surveys

In a face-to-face survey, it is also important to allow for follow-up visits when needed. Costs may limit these follow-up visits to one or two per household that did not respond. For an example of

a simple tracking method you could use in a face-to-face survey, see Figure 8-1 on page 34.

Scheduling and Tracking Telephone Surveys

For phone surveys, you should plan on up to five "callbacks" as the maximum number of contact attempts.

Scheduling and Tracking Mail Surveys

After sending out your mail survey, it is important to follow up with post card reminders and then a second mailing of the survey to those homes that have not completed the survey. Usually you should allow no more than a two-week interval between each of these steps.

Recruiting Interviewers

It is critical to hire a good team of surveyors. To hire a good team, you need to know who you should recruit. It is also important for you to hire the right number of people.

Who to Recruit

Look for the following qualities when hiring survey workers:

- good communication skills
- pleasant personality
- ability to speak another language (if English is not the primary language of the survey community)

It is also important to select surveyors who the local community will be willing to talk to.

You may be able to find potential workers by contacting local community organizations that may have access to or know of people who would be interested in survey work.

How Many Workers Should We Recruit?

You will need enough workers to be able to complete the total number of surveys by the

deadline you establish. You will be able to calculate the total number of hours you will need to complete all of the surveys. Once this is done you can then determine how many people you will need and for how long you will need them to administer the questionnaire during the period of time allotted for being in the field. For a telephone survey, if the interview itself takes about 20 minutes to complete, schedule 50 minutes per interview to account for “no answer” calls and answering machine delays.

The Number of Workers for Face-to-Face Surveys

The amount of time needed to complete a single survey will include (1) time to conduct the survey (based on the pretest experience) and (2) time to travel to the next household. Once you know the amount of time needed to conduct a survey, you can then multiply that amount of time by the total number of surveys to be completed. Because workers will need to take breaks, go to the bathroom, and have lunch, plan on about 6 hours of actual survey time per day.

The Number of Workers for Mail Surveys

For mail surveys, you will need clerical staff to help in printing surveys, numeric coding, addressing envelopes, stuffing envelopes, and mailing follow-up post cards to remind households to send in the survey. The amount of time needed to complete these tasks should be consistent with other mass mailings your community may have done in the past.

Starr County’s Experience With ...

CALCULATING TIME REQUIREMENTS

Starr County’s work group found these time requirements for their face-to-face survey:

Administering the survey: 30 minutes

Average travel time between homes: 10 minutes

Rest and bathroom breaks: 30 minutes per day

Lunch break: 60 minutes per day

Actual survey and travel time in 8-hour day = 6.5 hours (8 hours – time for rest, bathroom breaks and lunch)

Number of surveys to be completed per day = 8 - 9 (actual survey time divided by time to administer the survey plus travel time between homes)

Allowing for rest and bathroom breaks, lunch, and travel time between homes, workers completed 8 to 10 surveys per day. Extra time was factored in for returning to houses where nobody was home, for inclement weather, and for areas where there is greater distance between houses.

To survey Starr County’s sample of 320 houses required 10 workers and four days.

The Number of Workers for Telephone Surveys

For a telephone survey, for the amount of time it takes to complete the survey, add another 30 minutes to account for “no answer” calls, phone recording delays, breaks, and lunch. For example, plan on needing a total of 50 minutes to complete a 20-minute survey. So, if you want to complete 200 questionnaires, you should expect to need 167 hours of interviewing time:

$$200 \text{ interviews} \times 50 \text{ minutes per interview} \div 60 \text{ minutes/hour} = 167 \text{ hours of interviewing time needed}$$

Example 7-1.

Calculating Time Needed to Complete the Survey

$$\text{number of interviews} \times \text{minutes per interview} \div 60 \text{ minutes/hour} = \text{hours of interviewing time needed}$$

For example, the community in Example 4-1 wanted to complete 447 questionnaires. They would calculate the amount of interviewing time needed as follows:

$$447 \text{ interviews} \times 45 \text{ minutes per interview} \div 60 \text{ minutes/hour} = 335 \text{ hours of interviewing time needed}$$

Training

You will need to train interviewers for face-to-face and telephone surveys. By training your interviewers, you can identify and prevent recurring problems. These problems may include awkward wording and common questions asked back to the interviewer by respondents.

Training can also improve the reliability of the data you obtain. For example, if several interviewers found a question awkward to say over the phone, each might say it their own way during their interviews. If several surveyors ask the same questions differently, it might lead to very different interpretations among households (and the results for that one question would therefore contain much error).

Initial Training

Begin your training by making introductions of everyone present and discussing the purpose of the survey and the importance of proper garbage disposal. Next the supervisor should explain what is in the training packet, including each item and the questionnaire forms. The supervisor should read each form aloud. The survey workers should complete the survey in writing and then read the questions and answers aloud.

You should also use this session to cover these basic points:

- **The purpose of the survey.** If the interviewer does not understand the purpose of the survey or believe that it is providing valuable information, then their attitude can harm response rates and lead to half-hearted responses.
- **How to record responses.** The supervisor should go over the questionnaire with the survey workers to demonstrate how to record responses. Using an overhead projector to discuss the survey form can be helpful at this point in the training. Later, interviewers will practice recording responses in role playing.
- **Established callback or follow-up procedures.** Each interviewer must be familiar with your plans for these procedures.
- **How to end the survey.** Establish the same courteous closing statement for all interviewers. In this statement, your interviewers should offer a follow-up contact for respondents who have more questions about the survey project. For example, this contact could be a government official who can confirm who is organizing the survey.

Role Playing

Role playing is the best way to make sure your interviewers have learned to conduct the interview as it should be. For the role-playing exercise, the interviewers should break into groups of three. In each group, there will be an interviewer, a respondent, and an observer.

The interviewer administers the questionnaire to the respondent and records the responses. The observer takes notes on any questions that were difficult to speak to the respondent and notes any parts of the survey questionnaire that were not administered correctly.

Repeat the role playing three times so each person in the group can take a turn in each role—interviewer, respondent, and observer.

After the role playing, the group should meet to share any questions or comments about the process, paying particular attention to the notes each observer made. The supervisor should review the questionnaire recording for consistency and completeness, debrief the interviewers, and resolve any recording questions.

In addition to checking out your interviewers' understanding of the survey procedure, you can use role playing to help your interviewers develop these skills:

- **How to get respondents to cooperate.** Interviewers should be able to briefly and convincingly state:
 - (1) the purpose of the survey
 - (2) the value of the survey
 - (3) how much time it will take
 - (4) how responses will remain confidential
 - (5) who is sponsoring the survey
- **How to be nonjudgmental.** Interviewers must also be careful to present a non-judgmental approach to the questions, so as to not influence the responses. In the role playing, interviewers should practice using a neutral tone in asking the survey questions and in answering questions from the respondent.

When playing the part of the respondent in the role-playing exercises, the survey workers should evaluate the manner in which the interviewer is asking the questions, in order to provide

a constructive critique of how each worker is asking the questions.

Field Testing

The next phase of the training is for workers to go to the field. The supervisor should select a survey block not in the official sample. Then, sets of two interviewers should visit at least two houses, allowing each worker to administer the survey

Starr County's Experience With ...

TRAINING INTERVIEWERS

In Starr County, interviewers completed about five hours of training before going out into the field. Each interviewer had a packet containing the following items:

- Instructions for the survey worker
- Survey instruments to be completed that day
- A 30-gallon plastic garbage bag (This bag served as a visual cue to help respondents estimate how many bags of garbage they produced each week. It was also used to show how garbage could be disposed of at a citizens' collection station.)
- A sample sticker like those that could be purchased to affix to garbage bags to be thrown out at a citizens' collection station
- Environmental education materials to be distributed to respondents
- Folder or clipboard on which to fill out the survey
- Pepper spray should dogs become a problem
- 8" x 10" color photo of a citizens' collection station in a plastic sleeve to protect it
- 2 or 3 pens
- A distinctive T-shirt, cap, or other clothing to identify them as a survey worker
- An official letter explaining the purpose of the survey that can be shown to respondents
- Maps of the areas to be surveyed with the block numbers and house numbers marked
- A list for each survey worker indicating the blocks and the houses that they are responsible for surveying

questionnaire at least once. The survey supervisor should be available to the workers at this time to answer any questions that may arise from the survey respondents.

Giving Your Target Areas Advance Notice

If you have the resources and the correct mailing addresses, send an advance-notice letter to households for mail, telephone, and face-to-face surveys. In this letter, explain why they were selected and the benefits that the survey will provide to the community. By giving your respondents this advance notice, you may get a higher response rate.

You may also want to send a press releases to the local press (newspapers and TV and radio stations). This publicity can help reduce refusals and increase cooperation. You should also provide a telephone number to the public, in case they have questions about the survey.

Planning Field Supervision

The supervisor may want to monitor survey workers' efforts to ensure that the work is being done as intended.

For face-to-face interviews, the field coordinators can do spot checks to make sure interviewers are in their assigned blocks and actually walking the neighborhoods, meeting with families, and doing the surveys—not just sitting in one house making up responses for all the surveys. Field coordinators can also answer questions the surveyors may have, provide supplies, and bring refreshments

In telephone surveys, the supervisor can listen in on a few calls to make sure the interviewers are being courteous, that they are not leading respondents to answers that they prefer, and that they are following the survey directions correctly.

On mail surveys, the supervisor can check to ensure that cover letters have appropriate addressing, that the survey numbering system and addresses match, and that the tracking system is being used to make sure that households that have already replied do not receive follow-up surveys.

STEP 8:

ADMINISTER THE QUESTIONNAIRE

Now you're ready to equip your interviewers with their survey packets and send them out into the field. To make sure that the quality control measures you established in Step 7 are carried out and that the survey goes smoothly, have your survey coordinator ensure that everyone follows a set procedure such as this:

1. **First thing in the morning, meet at a central location**—Distribute the survey packets for the day to your interviewers. These packets should include an area map, a map of the interviewer's block, a list of households to survey in that block, your questionnaires, and other survey materials.

In this meeting, review the maps to confirm that each interviewer knows the boundaries of the survey, the boundaries of their block, and the location of their selected households. Remind the interviewers of what they learned in training: the basic interviewing procedure and the attitudes required for a successful interview.

2. **Report to the field**—Have the workers drive to their appointed areas, or drop them off with a preset pickup point. The workers should begin their interviews as soon as they get to the field. You may want your workers to operate in pairs, either two to a household or one each at nearby households. Have them complete the tracking log (for example, Figure 8-1) as they complete their interview.
3. **Provide inspection and support**—During the day, have your survey coordinator circulate through the areas being surveyed to do spot checks. The survey coordinator should stop to help the interviewers if needed. Also, the survey coordinator could pick up the completed questionnaires periodically to check for incorrect skips, unanswered questions, or notes that are confusing, illegible, or both. If any of these

problems occurs, get it corrected as soon as possible, preferably on the same day.

4. **End the day**—Have the workers check back in at your central location. Your survey coordinator may gather them and bring them back in if they don't have cars. Collect the completed questionnaires, transfer information from the individual lists to your master list, and note which households have not yet been contacted. Also, note any recurring problems with administering the questionnaire and try to address them in the morning meeting the following day. Finally, collect all of the unused materials and packets for use the next day.

Starr County's Experience With ...

CONDUCTING THE SURVEY

In Starr County, the survey coordinator had the help of a quality assurance (QA) worker during the training and the actual survey.

While the survey was being administered in the field, the QA worker met with the interviewers four times a day—mid-morning, noon, mid-afternoon, and at the end of the day—at preset locations and times.

At each of these meetings, the interviewers turned their completed surveys in to the QA worker, who checked them off the master list as shown in the example in Figure 8-1. The QA worker also reviewed the surveys to ensure that they had been completed properly. For example, the worker checked for unanswered questions, incorrect skip patterns, and confusing notes.

By identifying these problems in the field, the QA worker made it possible for the survey workers to return to that household the same day to clarify inconsistencies.

Figure 8-1. Completed Tracking Chart for Tierra Linda

Block 8			Block 9			Block 10		
Unique Code	Contacted (Follow-ups)	Completed	Unique Code	Contacted (Follow-ups)	Completed	Unique Code	Contacted (Follow-ups)	Completed
102-4	10/8 ()	10/8	164-19	10/8 ()	10/8	110-41	10/8 ()	10/8
103-8	10/8 ()	10/8	165-20	10/8 ()	10/8	113-39	10/8 ()	10/8
104-9	10/8 (f)	10/8	166-22	10/8 ()	10/8	115-38	10/8 ()	10/8
105-10	10/8 ()	10/8	167-23	10/8 ()	10/8	116-37	10/8 ()	10/8
106-11	10/8 (ff)	10/8	169-25	10/8 ()	10/8	120-33	10/8 ()	10/8
107-15	10/8 ()	10/8	170-26	10/8 (ff)		121-32	10/8 ()	10/8
108-16	()		171-27	10/8 ()	10/8	122-31	10/8 ()	10/8
109-16	()		173-29	10/8 ()	10/8	123-30	10/8 ()	10/8

Note: This tracking chart shows the progress of three interviewers in one day, October 8, 1999. Only the interviewer assigned to Block 10 was able to complete all eight interviews for the day. In Block 8, the interviewer did not reach the last two households (108-16 and 109-16). In Block 9, the interviewer found no one home at household 170-26, even after two follow-up visits.

STEP 9:

CODE THE SURVEYS

Before you can analyze the results of your survey, you must prepare the raw data for analysis.

This preparation involves these five steps:

- Select your coding supervisor.
- Establish your coding procedures.
- Select your coding team.
- Code the data.
- Clean the data.

Select Your Coding Supervisor

Your coding supervisor will be responsible for establishing the coding procedure, overseeing the workers who code the survey results, resolving difficult coding questions, and cleaning the data when coding is complete. Your coding supervisor should also be familiar with the spreadsheet, word processor, and any other software to be used in coding the data.

“Coding” is a process of turning the answers you received into numbers. For closed-ended questions, the value of the number will actually represent the answer—for example, a “2” may mean “yes,” and a “1” may mean “no.” For open-ended questions, the number may simply be the percentage of people who gave a particular answer.

“Cleaning” is a process of combing through the coded results to remove coding errors—for example, a code of 8 for the answer to a question that cannot have an answer code greater than 5.

Consequently, you need your coding supervisor to be comfortable—and quick—with numbers. If you cannot find someone who is familiar with surveys and statistical analysis, at least find an accountant, bookkeeper, or another person who has experience working with numbers.

Because training and evaluating the coders are important parts of this job, your coding supervisor should also be a good teacher. If necessary, team your coding supervisor with a good teacher who will help with training and evaluation.

Establish Your Coding Procedure

By establishing your coding procedure ahead of time, you can make sure that the quality controls you need will be in place before you need to code the surveys. Be sure your coding procedure covers all aspects of the tools you design to assist your coders, the procedures you will use to keep track of where your surveys are throughout the process, and quality controls.

Coding Tools

By designing three simple tools—a coding checklist, a coding key, and a coding template—you can help your coders do their work quickly and correctly. At the same time, these tools will make it easier for your coders to follow the correct tracking procedures and other quality controls.

- **A coding checklist.** Prepare a coding checklist that you can staple to the front page of each questionnaire that is ready for coding. The idea of this checklist is to prevent coders from coding the same answers twice. Your checklist should have these features:

- a blank at the top for the survey block name, number, or code
- a blank at the top for the survey unique number
- a box to check when *all* closed-ended questions have been coded
- a separate box for *each* open-ended question
- blanks for the coder who codes a question or set of questions to enter their initials and the date

- **A coding key.** See “Assigning Answer Codes” on page 37 for specific information about coding closed-ended questions. Give each coder a copy of this key to use as they code the surveys.

- **A coding template.** Develop a template that your workers can use to code surveys. See “Setting up Your Spreadsheet” on page 37 to find out about the column headings needed in your template.

Survey Tracking Procedures

Survey tracking procedures are the methods you use to ensure that the completed surveys are not lost, misplaced, or jumbled before, during, and after coding. These procedures include survey security measures and handling controls.

- **Survey security measures.** The most important quality control during coding is to continue to keep all of the completed surveys in one safe place. Don’t allow any of your workers to take questionnaires home. If the surveys are lost, stolen, or destroyed, all your accomplishments to that point will be lost.
- **Handling controls.** Consider the completed surveys for each of your blocks to be a “batch.” Keep this batch together throughout the coding process. By doing so, you can ensure that you don’t lose individual surveys from a block or mix up surveys from different blocks. These basic handling controls may be all that you need:
 - Each coder will work with one batch at a time. No surveys from that batch will leave the coder’s work area until the whole batch has been coded.
 - A coder who is assigned to closed-ended questions will code *all* of the closed-ended questions for each survey in the batch. When the coder is finished with a survey, the coder will initial and date the checklist on the front of the survey.
 - A coder who is assigned to open-ended questions will code *only one* question for each survey at a time. This coder will also initial and date the checklist on the front of each survey as that survey is coded.
 - Whenever either type of coder is finished with a batch, they will bring the batch to the next available coder for another question or set of questions to be coded.

- When all questions have been coded on a batch of surveys, the coder will bring the batch to the coding supervisor for a final review.
- At any point in this process, the coding supervisor may conduct a spot check to ensure that these procedures are being followed correctly.

Other Quality Controls

In addition to the coding tools and tracking procedures, these quality controls will help you ensure that coding proceeds smoothly:

- **New filenames each day.** Coders should give the file a new name at the beginning of each day. For example, if your spreadsheet is Microsoft Excel, then a worker might name the first file “MSW1.xls.” At the beginning of the second day, the worker should open this file, save it under another name—for example, “MSW2.xls,” and continue coding. If a file becomes corrupted or is affected by a computer virus, then this procedure will ensure that you lose no more than a day’s worth of coding work.
- **Backup files.** Make sure to back up your data files each day on another hard drive, a “zip” disk, or a floppy disk.
- **Procedures for dealing with unusual responses.** If a coder encounters a response that cannot be coded under the established procedure, they should place the survey in a “question” folder so the coding supervisor can review it the next day.
- **Code for “no response.”** Develop a specific code for questions left blank—for example, “NR”—so you can distinguish between unanswered questions and answers of zero.
- **Spot checks.** Each day, the coding supervisor should randomly select 10 or 12 completed surveys and spot-check the coded spreadsheet against the responses in the surveys. If errors appear, have the worker who coded that survey correct them.

Select Your Coding Team

Each person on your coding team should be skilled in—or at least comfortable with—using the software you plan to use. Be sure to look for experience with both the spreadsheet software and the word processing program that you intend to use.

Before coding begins, train your coding team. Review the coding procedures. Let them open the template. Then, explain how the survey coding sheet works, and work through a few “dummy” answer sheets as a group to work through any questions and solve problems. If your coders have experience with these programs, ask if they can help you develop efficient methods of getting from the raw data to the information you need your survey to provide you.

Code the Data

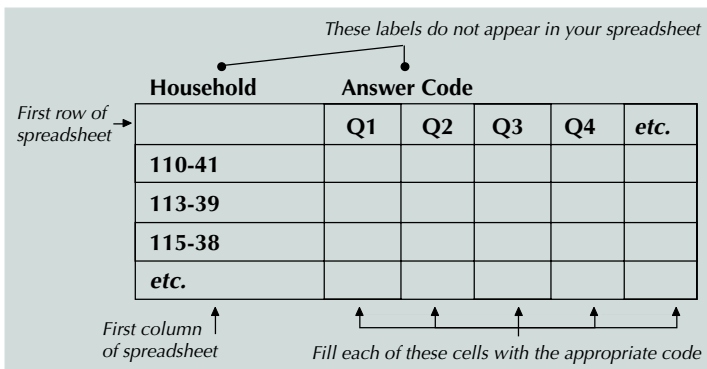
When a survey block is complete, begin coding the information for that block.

Coding Closed-Ended Questions

A question is “closed-ended” if there are a limited number of predetermined answers to choose from. A numeric code may be assigned to each answer, following a logical order.

Setting up Your Spreadsheet

Set up a computer spreadsheet in Microsoft Excel, Lotus, Symphony, or any other spreadsheet program. In the top row labels, enter the question numbers. Reserve the first column for each household’s unique code number.



If you set up these basics in a template, your coders will be less likely to make mistakes in creating new coding files.

Assigning Answer Codes

Make sure to keep your coding consistent—the numeric order (e.g., 4, 3, 2, 1) and response categories should follow the same order each time.

For example, Starr County’s coding supervisor assigned answer codes for two closed-ended questions as follows:

Q2. Do you ever have problems with odors or smoke from people burning household garbage in your neighborhood or from people dumping household garbage in your neighborhood?

Answer	Code
Yes, often	4
Yes, sometimes	3
No, hardly ever	2
No, never	1

Q3. How many bags of household garbage do you produce each week for a bag about this big?

(Number of bags = code)

Assign answer codes for each closed-ended question in your survey.

Inputting Answer Codes

To input the answer codes, the coders should go through one questionnaire at a time. Code that questionnaire from beginning to end, mark it as complete, and then start on the next questionnaire.

For example, here is how the first four questions might be coded for the households of Block 10 in the Starr County survey:

	Q1	Q2	Q3	Q4	etc.
110-41	3	2	3	1	
113-39	1	2	4	1	
115-38	3	4	8	1	
116-37	3	4	3	1	
120-33	3	2	3	1	
121-32	1	4	1	1	
122-31	3	1			
123-30					

This coder is still working on Household 122-31, but we can see that three of the households coded so far indicated that they often (Code 4) had problems with odors or smoke from the burning of household garbage, while the other households indicated that they hardly ever (Code 2) or never (Code 1) experienced such problems. The number of bags of garbage produced each week ranged from one bag to eight bags.

Coding Open-Ended Questions

Unlike closed-ended questions, open-ended questions may have many different answers, and there may not be a logical “order” to these answers.

For an open-ended question, you must first tally each response. Usually a few common responses will make up most of the answers. To code open-ended questions, create a separate word-processing file for each question and enter each written response along with the survey’s unique number. For example, the file for answers to Question 21 in the Starr County survey might read:

Because it is cleaner	(102-4)
It seems convenient	(103-8)
Convenience	(104-9)
It might be closer	(105-10)
It’s cleaner, and it would be closer	(106-11)
No response	(107-15)
<i>etc.</i>	

Once all the surveys are coded, tally the frequency of repeated responses for each question. For example, here is the frequency tally for the responses actually received to Question 21 when Starr County did its survey:

21. What makes a community collection station appealing to you?

Response	Frequency
No response	59
Because it is cleaner	63
Because it is closer	22
Because it is more convenient	25

For an open-ended question, the total number of responses may be greater than the total number of households if some households give more than one answer—for example, Household 106-11 would be counted as two responses (“cleaner” and “closer”).

Clean the Data

Data cleaning is simply a systematic way to spot and fix coding errors. When you find an error, you “clean” it by going back to the original completed questionnaire and changing the answer code to reflect the answer that household actually gave.

You can do a preliminary cleaning visually—that is, by looking at the form on screen or in hard copy. However, you should also use your spreadsheet’s reporting functions to help you do a more thorough cleaning.

Whenever you find an error, go back to that household’s completed questionnaire to find the correct answer. Replace the incorrect value with the correct code. You can identify the household from the unique code shown the first column of the row. Once you have corrected that question’s coding, look carefully at the questions before and after it to be sure that you don’t have an “off by one” error.

An “off by one” error occurs when a coder skips a question by accident or enters one household’s responses in another household’s row. If a question was skipped, all of the following responses for that household will be off by one column. If one household was placed in the wrong row, then adjacent households may be in the wrong row as well.

If you catch an “off by one” error, make sure that each erroneous response is cleaned.

Scan the Data for Obvious Errors

Scan the completed spreadsheet horizontally and vertically for these obvious errors:

- **Unusual gaps in coding.** An unusual gap could indicate that a keyboarding error resulted in the loss of a whole block of data. Check against the completed questionnaires to be sure gaps are real.

- **Values not on the coding scale.** If the only possible answer codes for a question are “1” and “2,” then a response of “888” is clearly an error that needs to be cleaned.
- **Unlikely responses.** This is similar to a value not on the coding scale. For example, if Question 3 asks, “How many of these bags of household garbage would your family produce in a week?” then you might want to check answers that were coded as “0.” Similarly, you might want to check answers that seem unreasonably high.

Review Reports for Less Obvious Errors

Most spreadsheet programs can generate a report called a “frequency distribution table” for the questions that you have coded into your spreadsheet. A frequency distribution table shows you how many times a response code appears for a particular question.

For example, your frequency distribution table might show this information for Question 1:

<i>Answer Code</i>	<i>Frequency</i>
0	10
1	234
2	120
3	6
4	0
5	0
6	0
7	0
8	1

If the only correct response codes for this question are “1” and “2,” then this report reveals that there are 17 errors to correct for this question—10 zeroes, 6 threes, and 1 eight. Furthermore, because the report reveals the exact values of these errors, you can use your spreadsheet’s “Search” function to quickly find these values in the Q1 column.

STEP 10:

ANALYZING DATA AND REPORTING YOUR RESULTS

Now that you have coded all the data, you need to interpret the data into information that is useful to your community's decision makers. If you think of this information—not your raw data—as being the results of your survey, you will find it easier to write a clear and concise report. Data analysis should focus on answering the questions posed in Step 2 of the MSW survey planning process.

Basic Analysis

If you used one of the four simple sampling procedures described in Step 4, then you can do the analysis described in this section without the help of an expert. However, if you used a more sophisticated sampling procedure, you probably need to “weight” your data before you can do even this basic analysis. Ask the expert who developed the sampling procedure for you to show you how to account for the sampling procedure in your analysis.

What Should We Analyze?

In this basic analysis, you develop information about simple issues. To do this analysis, you can use the same spreadsheet program you used for coding the closed-ended questions.

These questions are examples of simple issues:

- How do residents dispose of their household garbage?
- How long does it take them?
- How satisfied are they with their current options?

In your survey, several questions may address different aspects of the same issue. Group your questions according to the issue they address.

How Should We Do This Basic Analysis?

For each question or group of related questions in your survey, you can do four different types of basic analysis. The first is a frequency distribution. The remaining three are different methods of

Starr County's Experience With ... GROUPING QUESTIONS

For the Starr County work group, the first objective was to find out how residents were currently disposing of their household garbage. Three questions in their survey addressed this issue—Questions 4, 8, and 13:

4. Do you currently pay for household curbside garbage collection?
8. (*Asked of those with curbside collection*) What did you do to dispose of your household garbage?
13. (*Asked of those without curbside collection*) What did you do (to dispose of your household garbage)?

In their basic analysis of this issue, the work group considered all three of these questions. Although Questions 8 and 13 had been coded separately, the data from these two questions were grouped together in the basic analysis.

identifying the “most typical” answer or score—the simple average, the “most central” answer, and the most common score.

Depending on the design of a specific question, you may apply one or more of these types of analysis to it. By “design” of the question, we are referring to the types of answers you asked the respondents to give:

- a simple choice of two answers?
- the choice of one answer from several specific options?
- the choice of one or more answers from a list of specific options?

- an answer in their own words?
- a rating based on a five-point scale ranging from “poor” to “excellent”?
- a number—for example, how many bags of garbage the household produces each week?

Your choice of analysis also depends on the type of decision you must make based on the data. In this section, we will explain how to do each of these four types of basic analysis, tell you which kinds of questions you could apply it to, and give you an example or two of its application to a question that might appear on your MSW survey.

As you do these analyses, keep in mind that the statistics you produce are simply *estimates* of the true value in the overall community represented by your survey sample. Each of these estimates has both a margin of error and a level of confidence associated with it. In the examples, we will also show how to consider these factors as you interpret your statistical results.

The Frequency Distribution

If you coded the responses to a question into a spreadsheet, your spreadsheet program should be able to produce a frequency distribution table for you. For answers that you recorded as text, you can

easily prepare your own frequency distribution by tallying the number of times each answer was given.

You can use a frequency distribution table to analyze the responses to *any* type of question. If the question is designed for respondents to either choose their answers or come up with their own answers (in words), a frequency distribution table is the best form of basic analysis to use. For other types of questions, you can use the frequency distribution table as well as one or more measures of the average in the basic analysis of the data.

Example 10-1 illustrates how to use a frequency distribution to analyze the results of a typical question from an MSW survey.

In Example 10-1, note that, in addition to adding columns for percentages, we also added a row for “Total Valid Responses” in Figure 10-2. This value represents the actual survey sample for *this* question. Use this value to determine the margin of error and level of confidence of your survey results.

You also should pay attention to the total percentage of valid responses—in this case, 78.6 percent—for each of the key questions in your survey. Even if you get a high response rate for your survey overall, a low response rate to questions about participation rates, willingness to pay for service, or other information that will be important to the success of a

Example 10-1:
Finding the Frequency Distribution

Figure 10-1 shows an example of a frequency distribution table as it might be produced by your spreadsheet.

Figure 10-1.
Example of Frequency Distribution Table
Question: Do you receive curbside collection service?

Response	Frequency
Valid “No” (Code = 1)	114
Valid “Yes” (Code = 2)	129
Missing	66
Total	309

To make this information easier to interpret, you should convert it into percentages as shown in the expanded frequency distribution table in Figure 10-2.

Figure 10-2.
Example of Expanded Frequency Distribution Table
Question: Do you receive curbside collection service?

Response	Frequency	% of Questionnaires	% of Valid Responses
Valid “No” (Code = 1)	114	36.9	46.9
Valid “Yes” (Code = 2)	129	41.7	53.1
Total Valid Responses	243	78.6	100.0
Missing	66	21.4	
Total Questionnaires	309	100.0	

program could be a problem. Ask your expert consultant to tell you whether the response rate to each of these questions is high enough to enable you to draw valid conclusions.

The final column of the table in Figure 10-2 shows percentages based on the total number of

valid responses. Report the values in this column as your survey results for this question.

According to these results, a little more than half of the respondents surveyed—53 percent—receive curbside garbage collection service, and a little fewer than half—47 percent—do not. If

**Example 10-2:
Using a Frequency Distribution to Estimate Revenues**

A frequency distribution can be a valuable tool for estimating how many people would participate in a program that charges a user fee. The issue behind this question might be, “Can we set a user fee high enough for this program to pay for itself?” Assume that the community has a total of 3,500 households and that we already know from another question that a typical household will produce 3.6 bags of garbage per week.

**Figure 10-3.
Sample Frequency Distribution Table**

Question: What is the most you would be willing to pay—per bag—to use a citizens’ collection station?

Response	Frequency	% of Questionnaires	% of Valid Responses
Nothing	5	2.1	2.4
\$0.10	21	8.8	10.1
\$0.25	47	19.7	22.7
\$0.35	120	50.2	58.0
\$0.50	13	5.4	6.3
\$1.00	1	0.4	0.5
Total Valid Response	207	86.6	100.0
No Response	32	13.4	
Total Questionnaires	239	100.0	

Obviously, a household that is willing to pay a high fee would also be willing to pay a lower fee—for example, the household that would pay \$1.00 a bag will also participate if the rate is set at 50 cents. To estimate the percentage of households that would

participate at a certain rate, add up all the percentages for participation at that rate or higher:

35 cents a bag:
 $58.0 + 6.3 + 0.5 = 64.8\%$ participation

25 cents a bag:
 $22.7 + 58.0 + 6.3 + 0.5 = 87.5\%$ participation

With these estimates of the participation rate, you can now estimate the volume of waste per week as well as the annual revenue. We’ll do both calculations for the 35-cents-a-bag scenario:

Volume of waste:
 $0.648 \times 3,500 \text{ households} \times 3.6 \text{ bags} = 8,160 \text{ bags a week}$

Annual revenue:
 $8,160 \text{ bags a week} \times 52 \text{ weeks} \times \$0.35/\text{bag} = \$148,000 \text{ annual revenue}$

In your report, present this information to your community’s decision makers in a table:

**Table 10-1.
Estimated Participation Rates, Waste Volumes, and Annual Revenues for a Pay-as-You-Throw Program**

Fee per Bag	Participation Rate	Weekly Volume (bags)	Weekly Volume (cu. yds., loose)	Annual Revenue
\$0.35	64.8%	8,160	40.4	\$148,000
\$0.25	87.5%	11,000	54.6	\$143,000

Note: Values are estimates based on a survey of 207 households (margin of error ±5%).

With this information, they will be able to find the best balance of participation rate and annual revenue for your community.

the margin of error for this survey is 5 percent or less, the work group can conclude with reasonable confidence that slightly less than half of the overall community represented by the survey sample receives no curbside garbage collection service.

The Simple Average, or “Mean”

The mean is the value most people think of when they say they will calculate an average—you just add up all the values and divide the total by the number of answers. Your spreadsheet

Example 10-3: A Uniformly Happy Community

In addition to asking for actual numbers—how many bags of garbage? how much for a user fee?—most surveys also ask the respondents to express their feelings about an issue on a four- or five-point scale. For example, in the Starr County survey, Question 9 asks:

9. How satisfied are you with your current household garbage service?
- _____ very satisfied
 - _____ somewhat satisfied
 - _____ somewhat dissatisfied
 - _____ very dissatisfied

You would code this question as follows:

Response	Code
very satisfied	4
somewhat satisfied	3
somewhat dissatisfied	2
very dissatisfied	1

Now that the question is coded, you can calculate the mean of the codes to get a sense of your community’s “average” satisfaction with current service—if the data have a normal distribution.

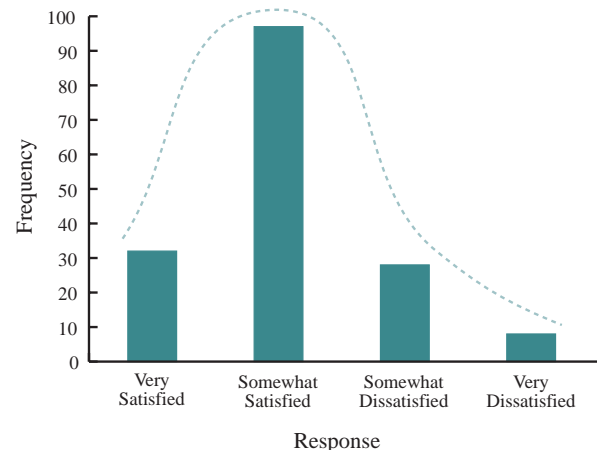
Assume Starr County found this frequency distribution in their results:

Response	Frequency	Code	Frequency x Code
Very satisfied	32	4	128
Somewhat satisfied	97	3	291
Somewhat dissatisfied	28	2	56
Very dissatisfied	8	1	8
Totals	165	NA	483

As you can see in the bar chart in Figure 10-4, the frequency distribution for this answer rises fairly smoothly from each side. If you connected

the tops of the bars, the shape would be something like a bell. It is obvious that most people in this sample are somewhat satisfied with their current service, and about as many people are very satisfied as are somewhat dissatisfied. The typical answer, obviously, is “somewhat satisfied.”

Figure 10-4.
How satisfied are you with your current garbage collection service?



Even though the answer to this question looks clear, it might be interesting to put a number on the sample’s general feeling about its current service. The “Frequency x Code” column and “Totals” row in Table 10-1 enable us to calculate this mean value and put a number on how satisfied the average respondent is:

$$483 \div 165 = 2.91$$

So, by calculating the mean, we can infer that the overall population feels a little *less* (2.91) than somewhat satisfied (3.0) with their current collection service.

should be able to calculate the mean value of a column of numbers.

The mean is one way to state the average value of data that truly are numbers—for example, the number of bags of garbage produced a week—or that have a sense of rank or order to them—for example, rating satisfaction with current service on a five-point scale. However, for the mean to be the best estimate of these values, the frequency distribution of the data must be normal. Be sure to check the frequency of distribution before selecting the mean as a “typical” value.

Of course, if the frequency distribution is normal, you can use the mean to safely estimate a total for the overall community—for example, the total volume of waste generated in a typical week.

Example 10-3 shows an interesting way to use the mean to express an estimate of the survey sample’s response to a question that asks, “How do you feel about ... ?” In Example 10-3, the responses have a normal frequency distribution. In Examples 10-4 and 10-5, they do not.

**Example 10-4.
Estimating Waste Generation**

Your survey will probably ask, in one way or another, “How many 30-gallon bags of garbage does your household dispose of each week?” As we saw in Example 10-2, this information is useful in estimating several important numbers that will guide decisions behind your municipal solid waste program. For now, let’s focus on finding the best answer to this question itself.

Imagine that after coding the responses you obtain a frequency distribution like that in Table 10-2.

**Table 10-2.
How many bags of waste does your household generate each week?**

	1	2	3	4	5	6	9	20	Row Total
Valid Responses <i>(No. of bags)</i>	13	91	117	25	2	3	1	7	259
Frequency	13	91	117	25	2	3	1	7	259
Response x Freq.	13	182	351	100	10	18	9	140	823

According to these results, the mean value is 3.18 bags of garbage per household each week: $823 \div 259 = 3.18$

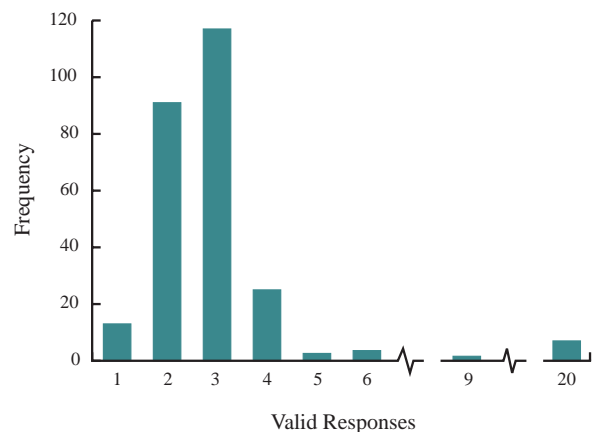
But do these data show a normal distribution? No, they don’t. Seven households—representing less than 3 percent of your sample—are very different from the rest of the group. These households claim to produce 20 bags of garbage a week apiece! The bar chart in Figure 10-5 shows how clearly they stand out from the rest of the survey sample.

With this skewed distribution, you should use the median value as your estimate of the number of bags of garbage a typical household would produce. In this case, the median value will have 129 [that is, $(259 - 1) \div 2$] values above it and another 129 values below it. That value would be one of the many 3s in the middle of the distribution, so the median value is 3 bags of garbage a week.

In this situation, you should also review the field notes your interviewer took on the day of the visit. What makes these seven households different from all the rest? For example, did they have small businesses, and so were disposing of more than just household garbage? Or were they unusually large extended families sharing one home?

**Figure 10-5.
A skewed distribution**

Question: How many bags of waste does your household generate?



The Most Central Value, or “Median”

The median value has the same number of scores above it and below it—the result from your typical, middle-of-the-road household. You can find its value quickly from the frequency distribution.

When you want to use your data to estimate a total for the overall community and the data do not show a normal distribution, use the median value. Example 10-4 illustrates a situation in which it is better to use the median in place of the mean as an estimate of the “typical” household’s behavior.

The Most Common Value, or “Mode”

The mode is the response given more frequently than any other—in other words, it answers

the question, “What do the most people do?” To determine the mode of your data, check the frequency distribution table produced by your spreadsheet. To clearly illustrate the mode, prepare a bar chart from the data.

Questions with two fairly frequent responses—in other words, two modes—are particularly interesting, even if the second mode is not quite as frequent as the first. Example 10-5 is one example of a question that has two modes. A bar chart is especially useful for illustrating the presence of two modes.

When the data show two modes, two unique subpopulations may be present in your survey sample. For this reason, a question with two modes may be a good candidate for advanced analysis.

Example 10-5: A Divided Issue

In this example, we will return to the same question we used in Example 10-3: “How satisfied are you with your current household garbage service?” Assume that, instead of the responses received in Example 10-3, Starr County received the responses shown in Table 10-3:

Table 10-3.
How satisfied are you with your current household garbage service?

Response	Frequency	Code	Frequency x Code
Very satisfied	94	4	376
Somewhat satisfied	12	3	36
Somewhat dissatisfied	12	2	24
Very dissatisfied	47	1	47
Totals	165	NA	483

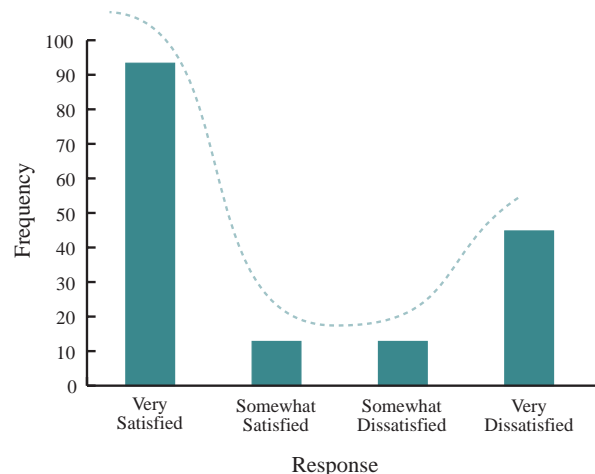
The mean value of these responses is the same as the mean in Example 10-3—an average feeling of 2.91 on a four-point scale. But even though the average response is a little less than “somewhat satisfied,” very few respondents gave this supposedly “typical” response.

A better way to do a basic analysis of the responses to this question would be to use the frequency distribution to find the mode or modes. As Figure 10-6 shows, this survey sample contains

two widely divided groups. About a hundred respondents are very satisfied with their current service, but half as many are very dissatisfied. There are relatively few responses in between.

A more advanced analysis of the data from your study might reveal a number of ways the respondents who are very dissatisfied with current service differ from the respondents who said they were satisfied. Knowing how they are different would help you develop a service that could satisfy the needs of both groups.

Figure 10-6.
How satisfied are you with your current garbage collection service?



Advanced Analysis

To address complex issues, you will need to use more sophisticated methods of analysis. These are a few examples of issues you can't address with the basic data analysis we just described:

- Are wealthier people more willing to pay a user fee?
- Do smaller households recycle more of their waste?
- Are middle-income people more likely to compost their grass clippings, leaves, and kitchen scraps?
- Are colonia residents more likely than residents elsewhere to burn their waste?

A statistician would express these questions as follows:

- Does willingness to pay a user fee vary by income level?
- Does willingness to recycle vary by household size?
- Does composting of waste vary by income level?
- Does burning of waste vary by geographic area?

If you need to get this information from your survey data, then you will need sophisticated statistical software to do the related calculations. You can buy the software—three common programs are SPSS, SAS, and LIMDEP—but you will need the help of someone who is experienced with statistics to use these programs correctly. See “Get Help or Go It Alone?” on page 12 for suggestions on where to find this expert help.

Reporting Results

Your final task is to write up your survey results in an easy-to-read format. As you do, remember that you are presenting your survey's *results*, not merely the data you collected. Try to present your most important message without letting individual details get in the way. Any details that do not directly and strongly support your main message belong in an appendix, not in the main body of your report.

Here is one fairly standard approach to organizing a survey report. You may want to

change the actual headings so they are more meaningful to your community, but you should organize the information into these types of sections as much as you can:

- **Executive summary:** Think of this as “The 10 O’Clock News” version of your survey results—all you would say if you had to say it in two minutes or less. Put this brief, to-the-point statement of your survey’s most significant findings before the main report.
- **Problem statement:** The “problem” is your reason for doing the survey. Tell what problem you intended to study and where you intended to study it. A good illustration to use in this portion of your report would be a community map that shows the areas you surveyed and other similar areas in your community.
- **Methods and procedures:** In this section, you explain the “nuts and bolts” of how you did the survey—the survey method you selected, your sampling procedure, the time of year you did the study, and other details.
- **Limitations:** A “limitation” is anything that made it difficult to carry out the survey as planned, reduced the response rate, or otherwise contributed a possible source of error to your results. For example, what if you intended to survey migrant farm workers, but a late harvest kept them in the fields throughout your survey? In this section, state the limitations you encountered and tell what you did to deal with those limitations. For Starr County’s experience with handling limitations, see the sidebar on page 48.
- **Findings:** In this section of your report, present the survey results in a logical order—not necessarily the order in which the questions were asked. Emphasize the most significant results—that is, the results you will draw on for the implications you will present in the next section. Use tables, charts, and other illustrations when they help convey a specific point. For example, the bar chart in Example 10-3 would add little or nothing to the final report, but the bar chart

in Example 10-5 strongly illustrates the point that this community is deeply divided on that issue. When you use illustrations, be sure that they are easy to read—each of them should be worth a thousand words, not a thousand distractions. Also, be sure to explain the level of confidence and margin of error for the results.

Starr County's Experience With ...

DEALING WITH LIMITATIONS

In Starr County, the work group encountered two significant limitations. They could plan ahead to deal with the first, but the second was a complete surprise.

The first limitation was that quite a few migrant farm workers lived in the colonias surveyed. Not all of these families had returned home from their seasonal work in time for the survey. Consequently, the opinions of migrant families may have been underrepresented in the survey results.

The second limitation was that two of the colonias experienced severe flooding from heavy rains the day before the field work began. Some families were flooded out. Some of these families were not back home during the survey; others were too busy putting their lives back together to be interrupted.

To compensate for the first condition, the work group chose to start the field work in October and November, a time when most farm workers are back home. To compensate for the effects of the flooding, interviewers returned a few weeks later to survey houses where nobody had been home during the initial survey.

- **Implications of the survey results:** In a sense, these are your conclusions. Considering your survey's objectives and the decisions that your community leaders will have to make, explain the significance of your survey results. For example, although much of the information from Example 10-2 belongs in the findings, the "Implications" section would be the place for that community's work group to make the point that setting a user fee of 35 cents a bag instead of 25 cents a bag would reduce participation heavily without significantly increasing total revenue.
- **Appendixes:** The first appendix to your report should be a copy of the survey questionnaire itself. If you can, enter the tally of answers under each question in this copy of the survey. If not, present the tally of all answers to all questions as a second appendix. In the following appendixes, present any supplemental information that you provided to respondents during the survey.

APPENDIXES



Appendix A

Community Municipal Solid Waste Survey

SURVEY INSTRUMENT

PREPARED IN COOPERATION WITH
THE UNIVERSITY OF TEXAS AT AUSTIN,
THE TEXAS NATURAL RESOURCE CONSERVATION COMMISSION,
AND
THE U.S. ENVIRONMENTAL PROTECTION AGENCY

The preparation of this survey instrument was financed by a subcontract from The University of Texas at Austin (funding from the U.S. Environmental Protection Agency to Texas Natural Resource Conservation Commission to The University of Texas at Austin)

ENGLISH VERSION

COMMUNITY MUNICIPAL SOLID WASTE SURVEY CITIZENS' COLLECTION STATIONS INTEREST SURVEY

SECTION 1: DESCRIPTION OF THE SURVEY

The (insert name of organization administering the survey) is working with your community to help you identify the best type of household garbage disposal services for you. In order to better understand your solid waste needs, they have developed a questionnaire to ask you about different household garbage services and a little bit about yourself.

All of the information is confidential – no one will know what you have said. We are going to collect all the information to get an idea of what your community thinks as a whole. It will take approximately 30 minutes, and we have a small gift for you for participating in the survey.

The results of the survey will be provided to local government and nonprofit organization officials to identify possible solid waste solutions for (insert name of neighborhoods included in the survey).

Neighborhood/Colonia _____

Street address _____

ZIP code _____

Block number _____

Survey number _____

Interviewed by _____

SECTION 2: INTRODUCTORY QUESTIONS

I'd like to start by asking you some questions about household garbage in your neighborhood and how you handle your household garbage.

1. Are there areas in your neighborhood where kids play in household garbage?

 Yes

 No

 Don't know

2. Do you ever have problems with odors or smoke from people burning household garbage in your neighborhood or from people dumping household garbage in your neighborhood?
[Read the following choices:]

 Yes, often

 Yes, sometimes

 No, hardly ever

 No, never

3. How many bags of household garbage do you produce each week for a bag about this big?
[Hold up garbage bag and let respondent reply. Ask respondent to approximate if she/he hesitates.]

 [Write the number of bags.]

4. Do you currently pay for household garbage collection?

 Yes **IF YES, GO TO SECTION 3.**

 No **IF NO, GO TO SECTION 4.**

SECTION 3: GARBAGE COLLECTION

5. How much do you pay each month for this service?

\$_____ [Write in amount per month in dollars.]

6. How often do they pick up your household garbage?

____ every day

____ twice a week

____ once a week

____ every two weeks

____ once a month

____ other

7. How much time did you spend in the last week throwing out your household garbage?

____ less than 5 minutes

____ 5-15 minutes

____ 16-30 minutes

____ 31 minutes to 1 hour

____ over an hour

8. What did you do to dispose of your household garbage? [Check all that apply:]

____ Bag the garbage

____ Take the containers to the street

____ Drive to the landfill

____ Sort the trash

____ Burn the garbage

____ Bury the garbage

____ Take recycling to a recycling center

____ Find someplace to dump it

____ Other

9. How satisfied are you with your current household garbage service?
[Read the following choices:]

___ very satisfied

___ somewhat satisfied

___ somewhat dissatisfied

___ very dissatisfied

**IF RESPONDENT ANSWERED “VERY SATISFIED” OR “SOMEWHAT SATISFIED,”
GO TO SECTION 5.**

**IF RESPONDENT ANSWERED “SOMEWHAT DISSATISFIED” OR “VERY DISSATISFIED,”
GO TO QUESTION 10.**

10. If you are not satisfied, why are you not satisfied?
[Check all that apply:]

___ too inconvenient

___ too expensive

___ too infrequent

___ rodents, mosquitoes, flies, ants, roaches, etc.

___ smoke and odors

___ we have to pay even when we are not here

___ we don't make that much household garbage

___ they leave trash behind

___ they leave the cans in the road

___ dogs tip over the trash cans

___ they come very early or very late

___ other [Write the reason:] _____

GO TO SECTION 5.

SECTION 4: NO CURBSIDE SERVICE

11. How often do you dispose of your household garbage?

[Read the following choices:]

every day

twice a week

once a week

every two weeks

once a month

other

12. How much time did you spend in the last week disposing of your household garbage?

less than 5 minutes

6-15 minutes

16-30 minutes

31 minutes to 1 hour

over an hour

13. What did you do?

[Check all that apply:]

Bag the garbage

Drive to the landfill

Sort the trash

Burn the garbage

Bury the garbage

Take recycling to a recycling center

Find someplace to dump it

Other

14. If you drive to the landfill or dump, how far is it round-trip in miles?

0-5 miles

5-10 miles

10-15 miles

15-20 miles

more than 20 miles

don't drive to the landfill

IF RESPONDENT DRIVES TO THE LANDFILL, GO TO QUESTION 15.

IF RESPONDENT DOESN'T DRIVE TO THE LANDFILL, GO TO QUESTION 16.

15. On average, how long does it take you to drive round-trip and dump your wastes at the landfill or dump?

0-15 minutes

16-30 minutes

31-45 minutes

46 minutes - 1 hour

more than 1 hour

16. How satisfied are you with your current garbage disposal options?

[Read the following responses.]

very satisfied

somewhat satisfied

somewhat dissatisfied

very dissatisfied

**IF RESPONDENT ANSWERED "VERY SATISFIED" OR "SOMEWHAT SATISFIED,"
GO TO SECTION 5.**

**IF RESPONDENT ANSWERED "SOMEWHAT DISSATISFIED" OR "VERY DISSATISFIED,"
GO TO QUESTION 17.**

17. If not, why are you not satisfied?

[Check all that apply:]

___ too inconvenient

___ too expensive

___ too infrequent

___ too far to the dump

___ it contaminates my yard and neighborhood

___ rodents, mosquitoes, flies, etc.

___ smoke and odors

___ other **[Write in reason:]** _____

SECTION 5: THE WASTE STREAM & RECYCLING

Now I'd like to ask you some questions about how you dispose of different types of household garbage.

18. How do you deal with disposing of each of the following types of household garbage?

[Read each of the following:]

aluminum cans _____

glass _____

plastic _____

newspapers and other paper _____

corrugated cardboard _____

fruit/vegetable scraps and other food waste _____

yard waste _____

**IF RESPONDENT INDICATED THAT ANY OF THE ABOVE WERE RECYCLED,
GO TO QUESTION 19. IF NOT, GO TO SECTION 6.**

19. You indicated that you recycle some of your household garbage. Where do you recycle?

[Check all that apply:]

___ curbside

___ community recycling center

___ commercial recycling facility (for money)

___ other _____

SECTION 6: CITIZENS' COLLECTION STATIONS

Now I'd like to ask you how you would feel about different ways to dispose of your household garbage. I'd like to begin by talking with you about a citizens' collection station. **[Show photo.]**

A citizens' collection station is a place for residents to bring household garbage for disposal and/or recycling. Depending on the community, it is staffed by an attendant and usually is open a few times a week for residents to drop off their household garbage and recycling. Residents pay only for the amount of household garbage they throw away – by purchasing special garbage bags or stickers to place on garbage bags. You cannot throw out your garbage at the citizens' collection station without buying special garbage bags or stickers. Citizens' collection stations offer economical garbage disposal service to smaller, rural or unincorporated communities that do not have another viable means of garbage collection or disposal.

20. Would you be interested in a citizens' collection station which would be in a conveniently located place where you could take your trash for a low price?

___ Yes **IF YES, GO TO QUESTION 21.**

___ No **IF NO, GO TO QUESTION 22.**

21. What makes a citizens' collection station appealing to you?

GO TO QUESTION 23.

22. If you are not interested in a citizens' collection station, why not?

23. Would it matter to you if you had to drive to the station instead of it being located at the entrance of your neighborhood?

___ Yes

___ No

24. Why?

25. What is the farthest distance you would be willing to travel round-trip to dispose of your household garbage?

- 1 block - mile
- a little over mile - 1 mile
- a little over 1 mile - 5 miles
- 6-10 miles
- 11-15 miles
- 16-20 miles
- more than 20 miles

26. How long would you be willing to spend traveling round-trip to dispose of your household garbage?

- less than 5 minutes
- 6-10 minutes
- 11-15 minutes
- 16-30 minutes
- more than 30 minutes

27. What is the most you would be willing to pay per bag to dispose of your household garbage at a citizens' collection station?

- 25 cents or less
- 26 cents - 50 cents
- 51 cents - 75 cents
- 76 cents - \$1.00
- more than \$1.00

28. If you could just pay a monthly bill for its use, what is the most you would be willing to pay to dispose of your household garbage at a citizens' collection station?

- less than \$1 per month
- \$1 - \$5 per month
- \$6 - \$10 per month
- more than \$10 per month

Some collection stations let you buy garbage bags or stickers to place on your own garbage bags for a low price at conveniently located stores or offices. You can fill them with your garbage and drop them off at the citizens' collection station.

29. Would this be a system that you would use to dispose of your household garbage?
[Hold up sample of bag and sticker.]

___ Yes **IF YES, GO TO QUESTION 31.**

___ No **IF NO, GO TO QUESTION 30.**

30. If not, why not?

31. Rank your top three choices for the best times to drop off your garbage during a normal week, with "1" being your top choice. [Read the following choices and rank the top three, with "1" being the best time, "2" the next best, and "3" the next best.]

___ weekday mornings

___ weekday afternoons

___ weekday evenings

___ weekend mornings

___ weekend afternoons

___ weekend evenings

32. How would you take your household garbage to a citizens' collection station?

___ drive

___ have a neighbor take it for me

___ pull it in a wagon

___ pay someone in my neighborhood to take it for me

___ other _____

SECTION 7: DEMOGRAPHIC INFORMATION

I'd like to ask you a little bit about yourself and your family. The reason we ask these questions is to get a better idea of who makes up your community. All of the information is confidential. Your name or address will not be included in any report.

33. How many adults over age 18 live in your household?

___ **[Write in number of adults.]**

34. What is the highest level of education completed by the head of the household?

___ less than 6th grade

___ 6th-9th grade

___ 9th-12th grade

___ high school graduate

___ vocational school

___ some college

___ college degree

35. How many children under age 18 live in your household?

___ **[Write in number of children.]**

36. If any of your children are in school, what grades are they in?

[Check all that apply:]

___ pre-K

___ 6th grade

___ Kindergarten

___ 7th grade

___ 1st grade

___ 8th grade

___ 2nd grade

___ 9th grade

___ 3rd grade

___ 10th grade

___ 4th grade

___ 11th grade

___ 5th grade

___ 12th grade

37. What is your total average household income each week before taxes, including government assistance? Include yourself and all people living in the household.

___ \$0 - \$100

___ \$101 - \$200

___ \$201 - \$300

___ \$301 - \$400

___ \$401 - \$500

___ \$501 - \$1,000

___ more than \$1,001

___ don't know/refused to answer

38. How long have you lived in this neighborhood/colonia?

___ less than 6 months

___ more than 6 months but less than 1 year

___ 1-5 years

___ 6-10 years

___ 11-15 years

___ 16-20 years

___ more than 20 years

39. What language do you speak the most at home?

___ English

___ Spanish

___ Equal amounts of English and Spanish

___ Other (name) _____

40. From where do you get most of your news/information?
[Read the following choices. Check all that apply:]

TV (English)

TV (Spanish)

Radio (English)

Radio (Spanish)

Newspaper (English)

Newspaper (Spanish)

Church newsletter

School newsletter

Community or non-profit organization

Some other source [Write in:] _____

41. Do you occupy your home year-round?

Yes **IF YES, GO TO SECTION 8.**

No **IF NO, GO TO QUESTION 42.**

42. If not, during which months are you typically gone? We need to know this to estimate total trash flow in your area throughout the year.
[Check all that apply:]

Jan July

Feb Aug

Mar Sept

April Oct

May Nov

June Dec

SECTION 8: ILLEGAL DUMPING

43. Do you know of places where people dump their trash other than the landfill?
[Hold up a map for respondent to show where.]

Yes

No

Don't know

44. Do you know what could happen to people who dump their household garbage illegally?

Yes

No

Dumping household garbage in places like along a roadside, in a ditch, or in a vacant lot is against the law; punishments can include fines, jail time, and loss of the vehicle used by the violator. It is illegal to let anyone dump garbage on your property, and you may have to pay for getting it cleaned up.

45. If more people knew about this law, do you think they would be less likely to illegally dump their trash?

Yes

No

Thank you again for your help. Here is our gift to you for helping us.



Appendix B

Encuesta Sobre Desechos Solidos Municipales

INSTRUMENTO DE ENCUESTA

PREPARADO CON LA COOPERACION
DE LA UNIVERSIDAD DE TEXAS-AUSTIN,
LA COMISION DE TEXAS PARA LA CONSERVACION DE LOS RECURSOS NATURALES,
Y
LA AGENCIA PARA LA PROTECCION DEL AMBIENTE

La preparación de esta encuesta fué financiada por un subcontratista de la Universidad de Texas-Austin (con fondos provenientes de la Agencia para la Protección del Ambiente a la Comisión de Texas para la Conservación de Recursos Naturales hacia la Universidad de Texas-Austin)

SPANISH VERSION

ENCUESTA SOBRE DESHECHOS SÓLIDOS MUNICIPALES ENCUESTA PARA DETERMINAR EL INTERÉS EN LOS DEPÓSITOS DE BASURA PARA LA COMUNIDAD

SECCIÓN 1: DESCRIPCIÓN DE LA ENCUESTA

La (anotar aquí el nombre de la organización que está haciendo ésta encuesta) está trabajando con su comunidad para ayudarle a identificar la mejor manera de deshacerse de la basura de la casa. Para entender mejor sus necesidades de deshacerse de la basura de la casa, la organización que está haciendo ésta encuesta hizo este cuestionario para preguntarle sobre diferentes servicios para deshacerse de la basura, y un poco sobre usted.

Toda la información es confidencial — nadie sabrá lo que usted ha contestado. Vamos a recoger toda la información para entender lo que piensa toda su comunidad. Se tardará aproximadamente 30 minutos, y le daremos un pequeño regalo por participar en la encuesta.

Los resultados de la encuesta se usarán para identificar posibles soluciones para deshacerse de la basura en (anotar aquí el nombre de los vecindarios incluidos en ésta encuesta).

Colonia/Vecindad _____

Domicilio [Número de la casa] _____

Código Postal _____

Número de la cuadra _____

Número de la encuesta _____

Nombre del entrevistador _____

SECCIÓN 2: PREGUNTAS INICIALES

Primero, quiero preguntarle sobre la situación de la basura en su colonia y qué hace usted con la basura de su casa.

1. ¿Hay en su colonia lugares con basura donde los niños juegan?

___ Sí

___ No

___ No sabe

2. ¿Alguna vez ha tenido problemas en su colonia por mal olores o humo que resulta cuando se queman o se tiran la basura? **[Lea las siguientes respuestas:]**

___ Sí, con frecuencia

___ Sí, a veces

___ No, casi nunca

___ No, nunca

3. ¿Cuántas bolsas de basura de este tamaño produce su casa cada semana? **[Sostenga una bolsa de basura y pídale a la persona que responda — si la persona no está segura, dígame que dé una respuesta aproximada.]**

___ **[¿Cuántas? escriba el número de bolsas]**

4. Actualmente, ¿paga usted para recoger la basura de su domicilio?

___ Sí **SI CONTESTA SÍ, PASE A LA SECCIÓN NO. 3.**

___ No **SI CONTESTA NO, PASE A LA SECCIÓN NO. 4.**

SECCIÓN 3: RECOLECCIÓN DE BASURA

5. ¿Cuánto paga al mes por el servicio para recoger la basura de su domicilio?

\$_____ [Escriba la cantidad por mes, en dólares.]

6. ¿Con qué frecuencia se recolectan la basura de su casa? [Lea las respuestas siguientes.]

_____ todos los días

_____ dos veces por semana

_____ una vez por semana

_____ cada dos semanas

_____ una vez por mes

_____ otro

7. ¿Cuánto tiempo se tardó en tirar la basura de la casa la semana pasada?

_____ menos de 5 minutos

_____ 5-15 minutos

_____ 16-30 minutos

_____ 31 minutos a una hora

_____ más de una hora

8. ¿Qué hizo para deshacerse de la basura de la casa? [Marque todas las respuestas pertinentes:]

_____ Puse la basura en bolsas

_____ Saqué los botes de basura al frente de la casa

_____ Manejé al relleno sanitario

_____ Separé la basura

_____ Quemé la basura

_____ Enterré la basura

_____ La llevé al centro de reciclaje

_____ Encontré un lugar dónde tirar la basura

_____ Otra cosa

9. ¿Qué tan contento está usted con el servicio de basura de la casa que está usando? **[Lea las respuestas siguientes:]**

___ muy contento

___ un poco contento

___ un poco descontento

___ muy descontento

**SI CONTESTÓ “MUY CONTENTO” O “UN POCO CONTENTO”,
PASE A LA SECCION NO. 5.**

**SI CONTESTÓ “UN POCO DESCONTENTO” O “MUY DESCONTENTO”,
PASE A LA PREGUNTA NO. 10.**

10. Si no está contento, ¿Por qué?
[Marque todas las respuestas pertinentes:]

___ Porque es demasiado inconveniente

___ Porque es demasiado costoso

___ Porque pasa rara vez

___ Porque hay ratones, ratoncitos, zancudos, moscas, cucarachas, hormigas, etc.

___ Debido al humo y a los olores

___ Porque tenemos que pagar aunque no estemos aquí

___ Porque no producimos mucha basura

___ Dejan basura en la calle

___ Dejan los botes en la calle

___ Los perros tumban los botes

___ Vienen muy temprano o muy tarde

___ Por otra razón **[Escribe la razón:]** _____

PASE A LA SECCIÓN NO. 5.

SECCIÓN 4: LA BASURA SIN RECOLECCIÓN A SU DOMICILIO

11. ¿Con qué frecuencia se deshace de la basura de la casa?

[Lea las respuestas siguientes:]

todos los días

dos veces por semana

una vez por semana

cada dos semanas

una vez por mes

otro

12. ¿Cuánto tiempo se tardó la semana pasada en tirar la basura de la casa?

menos de cinco minutos

6-15 minutos

16-30 minutos

31 minutos a una hora

más de una hora

13. ¿Qué hizo para deshacerse de la basura de la casa?

[Marque todas las respuestas pertinentes:]

Puse la basura en bolsas

Manejé al relleno sanitario

Separé la basura

Quemé la basura

Enterré la basura

La llevé al centro de reciclaje

Encontré un lugar donde tirar la basura

Otra cosa

14. Si maneja al relleno sanitario o al tiradero, ¿qué tan lejos es de ida y vuelta?

___ 0-5 millas

___ 5-10 millas

___ 10-15 millas

___ 15-20 millas

___ más de 20 millas

___ no maneja al relleno sanitario

SI VA EN CARRO AL RELLENO SANITARIO, PASE A LA PREGUNTA NO. 15.

SI NO MANEJA AL RELLENO SANITARIO, PASE A LA PREGUNTA NO. 16.

15. En promedio, ¿cuánto tarda de ida y vuelta para manejar y tirar la basura al depósito municipal de desechos sólidos o tiradero?

___ 0-15 minutos

___ 16-30 minutos

___ 31-45 minutos

___ 46 minutos - 1 hora

___ más de una hora

16. ¿Qué tan contento está con las opciones que tiene ahora respecto al deshecho de la basura de su casa? [Lea las respuestas siguientes.]

___ muy contento

___ un poco contento

___ un poco descontento

___ muy descontento

**SI CONTESTÓ “MUY CONTENTO” O “UN POCO CONTENTO”,
PASE A LA SECCION NO. 5.**

**SI CONTESTÓ “UN POCO DESCONTENTO” O “MUY DESCONTENTO”,
PASE A LA PREGUNTA NO. 17.**

17. Si no está contento, ¿por qué no? **[Marque todas las respuestas pertinentes:]**

Porque es demasiado inconveniente

Porque es demasiado costoso

Porque pasa rara vez

Porque es demasiado lejos del tiradero

Porque contamina mi patio y mi colonia

Porque hay ratones, ratoncitos, zancudos, moscas, cucarachas, hormigas, etc.

Debido al humo y a los olores

Por otra razón **[Escribe la razón:]** _____

SECCIÓN 5: LA BASURA QUE SE TIRA Y RECICLAJE

Ahora quiero hacerle algunas preguntas sobre cómo se deshace de diferentes tipos de basura de la casa.

18. ¿Cómo se deshace de cada uno de los siguientes tipos de basura de la casa?

[Lea las respuestas siguientes:]

latas de aluminio _____

vidrio _____

plástico _____

periódicos y otro papel _____

cartón _____

sobras de fruta/vegetales y otros desechos de comida _____

basura del patio o jardín _____

SI LA PERSONA INDICÓ QUE RECICLA CUALQUIERA DE LOS DESHECHOS MENCIONADOS ANTERIORMENTE PASE A LA PREGUNTA NO. 19.

SI NO LOS RECICLA, PASE A LA SECCIÓN NO. 6.

19. Usted indicó que recicla parte de la basura. ¿Dónde la recicla?

[Marque todas las respuestas pertinentes:]

___ recolección a su domicilio

___ en un centro de reciclaje

___ en un centro comercial de reciclaje (por dinero)

___ en otro lugar

SECCIÓN 6: LOS DEPÓSITOS DE BASURA PARA LA COMUNIDAD

Ahora quiero preguntarle qué piensa de las diferentes maneras de deshacerse de la basura de la casa. Primero me gustaría hablarle de una estación de depósito de basura. **[Muestre la foto.]**

Una estación de depósito de basura es un lugar donde los residentes llevan la basura de la casa para deshacerse de ella y/o reciclarla. Dependiendo de la comunidad, hay una persona allí que generalmente abre el depósito varias veces a la semana para que los residentes lleven la basura y la tiren o la reciclen. Los residentes sólo pagan por la cantidad de basura que tiran — comprando bolsas de basura especiales o etiquetas para poner en las bolsas de basura. No se puede tirar la basura en el depósito sin pagar por las bolsas o las etiquetas. Los depósitos de basura ofrecen un servicio económico para que las comunidades pequeñas, rurales o que no han sido incorporadas que no tienen otro método para recoger o deshacerse de la basura se deshagan de ella.

20. ¿Estaría interesado en un depósito de basura situado en un lugar conveniente donde se pueda deshacer de la basura por un precio bajo?

___ Sí **SI CONTESTA SÍ, PASE A LA PREGUNTA NO. 21.**

___ No **SI CONTESTA NO, PASE A LA PREGUNTA NO. 22.**

21. ¿Qué le atrae una estación de depósito de basura? **[Pase a la pregunta No. 23.]**

22. Si no está interesado en una estación de depósito de basura ¿Indique por qué no?

23. ¿Le importaría tener que manejar al depósito de basura para la comunidad en vez de tenerlo a la entrada de la colonia?

___ Sí

___ No

24. ¿Por qué?

25. ¿Cuál sería la distancia más larga de ida y vuelta que está usted dispuesta a manejar para deshacerse de la basura de la casa?

- una cuadra - media milla
- un poco más de media milla - una milla
- un poco más de un milla - cinco millas
- 6-10 millas
- 11-15 millas
- 16-20 millas
- más de 20 millas

26. ¿Cuánto tiempo estaría dispuesta a viajar de ida y vuelta para deshacerse de la basura de la casa?

- menos de cinco minutos
- 6-10 minutos
- 11-15 minutos
- 16-30 minutos
- más de 30 minutos

27. ¿Cuánto es lo máximo que pagaría por bolsa para deshacerse de la basura de la casa en una estación de depósito de basura?

- 25 centavos o menos
- 26 centavos a 50 centavos
- 51 centavos a 75 centavos
- 76 centavos a \$1.00
- más de \$1.00

28. Si pudiera pagar una cuota mensual por usarlo, ¿cuánto sería lo máximo que estaría dispuesto a pagar por deshacerse de la basura de la casa en una estación de depósito de basura?

___ menos de \$1 por mes

___ \$1 - \$5 por mes

___ \$6 - \$10 por mes

___ más de \$10 por mes

Algunos depósitos para la comunidad permiten que usted compre bolsas de basura o etiquetas para poner en bolsas de basura a un precio económico en tiendas u oficinas cercanas. Usted puede llenarlas con basura y deshacerse de ellas en la estación de depósito de basura.

29. ¿Usaría este sistema para deshacerse de la basura de la casa? **[Muestre la bolsa y la etiqueta.]**

___ Sí **PASE A LA PREGUNTA NO. 31.**

___ No

30. Si contesta no, ¿por qué no?

31. Escoge las tres mejores partes del día para deshacerse de la basura durante la semana con número "1" lo mejor, número "2" la segunda mejor, y número "3" la tercera mejor. **[Lea las respuestas siguientes y marque la mejor parte del día con "1", la siguiente mejor parte del día con "2", y la tercera mejor parte del día con "3".]**

___ durante la semana, por la mañana

___ durante la semana, por la tarde

___ durante la semana, por la noche

___ durante el fin de semana, por la mañana

___ durante el fin de semana, por la tarde

___ durante el fin de semana, por la noche

32. ¿Cómo llevaría usted la basura de la casa a una estación de depósito de basura?

___ manejaría

___ pediría que un vecino la llevara

___ la llevaría en una carretón

___ le pagaría a alguien del barrio para que la llevara

___ otro _____

SECCIÓN 7: INFORMACIÓN DEMOGRÁFICA

Quiero hacerle algunas preguntas sobre usted y su familia. La razón de estas preguntas es que queremos entender mejor cómo está formada la comunidad. Toda la información es confidencial. Su nombre y dirección no se van a incluir en ningún informe.

33. ¿Cuántas personas mayores de 18 años viven en su casa?

___ [Escriba el número de adultos.]

34. ¿Cuál es el nivel más alto de educación de la cabeza de la casa?

___ menos del grado seis

___ grado seis a nueve

___ grado nueve a doce

___ graduó de la secundaria

___ escuela vocacional

___ algunos años de la universidad

___ graduó de la universidad

35. ¿Cuántas personas menores de 18 años viven en su casa?

___ [Escriba el número de menores.]

36. Si alguno de los menores está en la escuela, ¿en qué año está?

[Marque todas las respuestas pertinentes.]

___ pre-Kinder

___ grado 6

___ Kinder

___ grado 7

___ grado 1

___ grado 8

___ grado 2

___ grado 9

___ grado 3

___ grado 10

___ grado 4

___ grado 11

___ grado 5

___ grado 12

37. ¿Cuál es la entrada de dinero total de la casa por semana antes de la deducción de los impuestos, incluso dinero de asistencia del gobierno? Cuente sus ingresos y todos los ingresos de las personas que viven en la casa.

___ \$0 - \$100

___ \$101 - \$200

___ \$201 - \$300

___ \$301 - \$400

___ \$401 - \$500

___ \$501 - \$1,000

___ más de \$1,001

___ no sabe/no quiere contestar

38. ¿Cuánto hace que vive en este vecindario?

___ menos de seis meses

___ más de seis meses, pero menos de un año

___ 1-5 años

___ 6-10 años

___ 11-15 años

___ 16-20 años

___ más de 20 años

39. ¿Qué idioma se habla más en su casa?

___ Inglés

___ Español

___ la misma cantidad de Inglés y Español

___ Otro (nombre del idioma) _____

40. ¿Cómo se entera de las noticias/de la información?

[Lea las respuestas siguientes. Marque todas las respuestas pertinentes.]

Televisión (Inglés)

Televisión (Español)

Radio (Inglés)

Radio (Español)

Periódico (Inglés)

Periódico (Español)

Boletín de la iglesia

Boletín de la escuela

Organización sin fin monetario

Otro [Escriba] _____

41. ¿Vive en su casa todo el año?

Sí **SI CONTESTA SÍ, PASE A LA SECCION NO. 8.**

No **SI CONTESTA NO, PASE A LA PREGUNTA NO. 42.**

42. Si no está en casa todo el año, ¿en qué meses típicamente está fuera de la casa? Necesitamos saber esta información para evaluar la cantidad de basura que produce su colonia durante un año entero. [Marque todas las respuestas pertinentes:]

enero

julio

febrero

agosto

marzo

septiembre

abril

octubre

mayo

noviembre

junio

diciembre

SECCIÓN 8: TIRAR BASURA ILEGALMENTE

43. ¿Conoce usted lugares donde la gente tira su basura ilegalmente?
[Muestre el mapa para que la persona señale el lugar.]

___ Sí

___ No

___ No sabe

44. ¿Sabe lo que le podría pasar a las personas que tiran ilegalmente la basura de la casa?

___ Sí

___ No

Tirar la basura de la casa en lugares como al lado del camino, en una zanja o en un lote desocupado es ilegal; el castigo puede ser una multa, la cárcel y la pérdida del vehículo usado por la persona que tira la basura ilegalmente. Es ilegal dejar que una persona tire la basura en su propiedad, y posiblemente usted tenga que pagar por limpiarla.

45. ¿Si la gente supiera que existe esta ley, cree usted que dejarían de tirar la basura en un lugar ilegal?

___ Sí

___ No

Muchas gracias por su ayuda. Este es su regalo por ayudarnos.



Appendix C

Results of the Community Solid Waste Survey for Select Portions of Starr County, Texas

FINAL REPORT

In 1997, Starr County Commissioner Eloy Garza, requested assistance from the Texas Natural Resource Conservation Commission's (TNRCC) Border Solid Waste Program in the Office of Waste Management to determine whether it would be feasible to implement a citizens' solid waste collection station (CCS)¹ as a more convenient and affordable municipal solid waste (MSW) disposal alternative for residents of three colonias (i.e., Las Lomas, Tierra Linda, and B&E) in Starr County. Although curbside garbage collection service is provided in that area by a private firm (i.e., Grande Garbage), the typical cost to residents of between \$10 and \$13 a month was believed to be more than what many families within those colonias could afford to pay for a MSW collection service. There was a strong perception that many families within the area were struggling to safely and affordably manage their MSW disposal needs because the only remaining disposal alternatives were (1) to make a 16 mile or more roundtrip drive to the county owned landfill each week, (2) to burn the collected trash on-site or (3) to illegally dispose of accumulated trash on or off-site.

The TNRCC agreed to assist Commissioner Garza in exploring the need for, and feasibility of

implementing a citizen's collection station. This was accomplished through preliminary field investigations by TNRCC staff and through the development and implementation of a community solid waste management survey. The MSW survey was created, pre-tested and then administered to a statistically representative sample of households within the three colonias during October and November of 1998. The questionnaire was designed to (1) obtain information on residents' current MSW management practices and attitudes, (2) to gauge residents' interest and willingness to pay for a CCS, and (3) to determine resident preferences about a CCS service should it be provided in the future.

This report describes the survey methodology in detail and then describes the survey results in narrative and statistical summary format. The Appendices provide blank versions of the survey instrument in English and Spanish formats as well as support materials that document the survey pre-test process. An abbreviated summary report is also provided to highlight the survey's major findings.

SURVEY METHODOLOGY

During the Fall of 1998, a survey questionnaire was developed by the TNRCC staff and its contracted

¹ A CCS is a place for residents to bring household garbage for disposal and/or recycling. Depending on the program design and community, a CCS is staffed by an attendant and usually is open a few times a week for residents to drop off their household garbage and recycling. In most programs, residents pay only for the amount of household garbage they throw away — by purchasing special garbage bags or stickers to place on garbage bags.

researchers that would provide answers to the following MSW questions:

- How are colonias residents currently disposing of their MSW?
- How much are colonias residents paying to dispose of their MSW?
- How much effort (time) is involved in disposing of their MSW?
- Are colonias residents satisfied with their current MSW management options with regard to convenience and affordability?
- Would colonias residents be willing to take their MSW to a community collection station?
- What is the maximum distances colonias residents would be willing to travel to dispose of their garbage at a community collection station?
- What is the maximum amount colonias residents would be willing to pay for taking their trash to a community collection station?
- Would colonias residents be willing to purchase bags at local stores or offices that they could fill and dispose of at the community collection station?
- Are colonias residents aware that it is illegal to dump their trash any where other than a legally authorized location? Does knowing this make them less likely to dump their trash illegally? Would an active enforcement program keep them from dumping?

Once an initial draft survey was completed to answer these questions, the survey instrument was reviewed and revised by the TNRCC staff and the contract researchers. The next draft of the survey was then translated into Spanish, reviewed for accuracy and then pre-tested in the border region of Texas. The results of that pre-testing were then used to make final refinements to the questionnaire: some minor changes in question wording, survey length and formatting were made in this final edit to enhance respondent understanding, to minimize the time needed to complete a survey, and to provide greater accuracy.

A sample frame for the three colonias was constructed using maps from the Texas Water Development Board, Colonias Unidas, and the Starr County 911 Office. The number and location of residential dwellings were verified by driving every street and comparing existing structures to those on the maps. A door-to-door survey was selected as the most appropriate survey method over a telephone or mail survey because (1) there was no reliable listing of all resident addresses or telephone numbers, (2) many colonias residents may not respond willingly or accurately by telephone or mail and (3) some questions required visuals to help residents more accurately respond.

A two-staged area probability sampling approach was used to select households (Fowler, 1988). This sampling approach ensured that all households within the colonias had an equal probability of selection. A sample of 320 households was drawn with an expectation of obtaining a final sample of approximately 250 households (i.e., an 80 percent response rate). The actual sample size was close to expectations at 243 correctly completed questionnaires. This provides a sampling error of +/- 6% with a 95% confidence interval.

The first door-to-door application of the survey was conducted between October 19th and the 22nd 1998. A follow up survey to capture households not present on the first effort occurred between November 4th and the 6th 1998. Ten survey workers were recruited by Colonias Unidas to assist with the survey effort. All resided in Las Lomas or Tierra Linda. After being trained, the workers were divided into pairs and assigned survey blocks. Survey workers were instructed to return three times to houses where nobody was at home. The timing of the survey field work was selected to include the most number of migrant farmworker families living in the three colonias. It was reported that Farmworker families usually migrate following the harvest from April/May to September/October.

Parts of Central and South Texas experienced heavy rains and flooding on October 16-18, 1998, immediately preceding the commencement of field work. Areas of Tierra Linda and Las Lomas were

flooded, forcing a number of families to evacuate their homes. For this reasons, three survey workers returned to the field on November 4-6, 1998 to survey households where nobody was home during the initial survey period.

A variety of steps were taken to minimize non-sampling errors including pre-testing of survey instruments and training/supervision of field survey staff. The careful survey sampling and administration along with the respectable response rate (76%) provides reasonable assurances that no serious sources of error or bias are likely. However, some error and bias is an inevitable component of survey research, so the results reported should be evaluated with this caveat in mind.

CURRENT WASTE COLLECTION PRACTICES AND ATTITUDES

Several questions were asked to measure residents' current MSW collection practices and attitudes. Trash production in the three colonias is higher than the statewide average, with between four (median value) and 4.7 (mean) 30-gallon trash bags being generated each week by the typical household. Approximately 53% of all households within the colonias use the curbside collection service and pay an average of \$12 a month for the service. The most common service schedule for curbside MSW service is once a week pickup (77% of all households with curbside service). The majority of the other 47% of households without curbside collection, currently bag their trash and drive it to the landfill. Those trash disposal trips are taken by the typical household once every week, although almost a quarter of all households need to make the trip more frequently. While it takes the typical household no more than 5 minutes a week to deal with trash under the curbside service, households without that service spend about 30 minutes each week on MSW collection and disposal. When queried about the drive to the landfill, households reported that the drive to the landfill is between a 10 and 15 mile drive and that it takes between 30 and 45 minutes on average to complete the trip.

Contrary to what one might expect given the greater waste disposal time demands, households without curbside MSW collection service did not report a high level of dissatisfaction with their current MSW options. Over 70% of the households without curbside collection service reported that they were very or somewhat satisfied with their current MSW disposal options. For the 30% of households that reported they were not satisfied, the most common reasons for dissatisfaction were inconvenience and the distance needed to travel to dispose of trash. Over 90% of all households currently receiving curb-side waste collection service reported that they were very or somewhat satisfied with their service. For those that were dissatisfied, the most common reason was that the service was too expensive or that pickups occur very early or late.

Very few households without curb-side pickup reported that they burn or dump their trash illegally. However, alternative questions revealed that approximately 40% of all households within colonias have frequently or sometimes noted problems from illegal burning or dumping of household wastes in their area by other households, and approximately 25% of those surveyed knew of places where people illegally dumped their trash. Residents report that they are aware of the possible penalties for illegal disposal of MSW (91%), but a strong majority (76%) still think that providing more widespread knowledge of potential penalties would be an effective way to prevent illegal dumping.

The greatest opportunities for recycling and MSW reduction within the colonias lie in aluminum cans and yard wastes. More than a quarter of households currently collect and sell/recycle aluminum cans at community or commercial recycling centers, however many households still simply throw away these recyclables. There is virtually no glass, plastic or paper recycling activity in the colonias at present. A large majority (70%) of all households reported reuse of biodegradable food wastes as animal feed supplements. However, almost 60% of residents report that they dispose of yard wastes and trimmings in their trash as opposed to composting.

FEASIBILITY OF IMPLEMENTING A CITIZENS' COLLECTION STATION: RESIDENT ATTITUDES AND WILLINGNESS TO PAY

Although there was not a high level of dissatisfaction reported with current MSW disposal services among households within the colonias, when those households were presented with a detailed description and visuals of how a citizen's collection station might operate, there was a high level of interest reported. Almost 90% of all households surveyed indicated that they would be interested in such a service if it could be *conveniently* located and offered at a *low* price. The most common reasons given as to why households were interested in this service were the perceived opportunity for (1) a cleaner environment, (2) less distance to travel for MSW service and (3) greater convenience over existing options. Among those households that were not interested, the most common reasons given were (1) concerns over odors and flies, and (2) contentment with existing MSW service.

To determine how low the price needs to be to keep the service option viable, residents were asked what the maximum dollar amount was that they would be willing to pay for a CCS under a pay-as-you-throw program (PAYT—residents pay a fee per bag of trash disposed that is verified by adhering a sticker to the trash bag or using a special color coded trash bag) and as a monthly service bill. The survey indicates that the PAYT approach is highly feasible. Virtually all households (95%) surveyed indicated that they would buy stickers or garbage bags to make use of a CCS program **if** the stickers/bags were available at conveniently located stores and offices.

Nearly 80% of the households surveyed indicated that they would be willing to pay no more than 25¢ per bag to use the CCS. At 50¢ per bag, CCS participation levels may drop to no more than 20% of all households. While that 25¢ per bag rate might seem low, it is important to note that current curbside collection service costs range between 60¢ and 75¢ a bag for many households.

Thus, it may well require a significant cost savings per bag, such as a 25¢ per bag fee, to convince households to use the CCS.

A 25¢ per bag fee does not necessarily mean that Starr County does not have an opportunity to recoup significant revenues from a PAYT program. If you extrapolate the survey frequency distribution on waste generation out to the three colonias as a whole (estimated at 833 households), you obtain a weekly waste generation rate of 3,837 bags of trash. If you multiply that number times 52 weeks, you have 199,524 bags of trash generated per year by the three colonias. If you then discount by some reasonable amount the number of households that will not use a CCS service (for discussion purposes let say 20%), you still have over 159,600 bags of trash each year. If you multiply 159,600 bags by 25¢ you have an annual revenue flow of approximately \$40,000 which could cover a significant portion of annual operating costs (depending on how the CCS is configured). It should also be noted that collection volumes are known to go higher than anticipated when others outside a service area decide the price and convenience of a CCS are significant enough to change their existing service options.

Using the same approach as the PAYT analysis, we find that a \$5 monthly fee might raise a comparable sum (\$39,420) if all respondents would accept the high-end of our survey response. A more conservative estimate using a mid-point value (\$3 a month), suggests that this billing approach would generate about \$23,700 a year in revenues while keeping 80% of the households as participants.

While price is clearly a key factor in evaluating the feasibility of the CCS service, so too is *convenience*. Convenience was clearly defined by respondents as a constraint: you can not require residents to go too far from the neighborhood if they are to use the CCS service. Sixty percent of the households would prefer to have the station near the entrance of their colonia. Almost eighty percent of the households would still use the CCS service if the station was kept between mile and a full mile from their neighborhood. Driving times to collection stations beyond about 8 minutes would risk losing half of the interested households. Clearly,

Careful siting of CCSs will be a critical issue for successful implementation, should Starr County decide to move forward with a CCS service.

SITING AND SETTING-UP OPERATIONS FOR A CCS SERVICE: RESIDENT PREFERENCES

In addition to the above description about maximum commute distance to CCSs, we also asked a series of questions to facilitate effective design and implementation of a CCS in Starr County. For example, the preferred operating hours, in order of greatest demand, were (1) weekday mornings, (2) weekday afternoons, and (3) weekend mornings. Most households (over 80%) expect that they would drive to the CCS, so all weather surfacing and traffic access/safety will be important consideration in siting and design of CCSs. For those not driving the trash themselves, most other households expected to have neighbors deliver the trash for them, or to pay someone in the neighborhood to deliver the trash to the CCS.

The language most commonly spoken at home in the colonias is Spanish (nearly 80% of all households), so schedules, Public Service Announcements and informational brochures should be produced in Spanish and English to capture as wide an audience as possible. The remaining households (20%) report that equal amounts of English and Spanish are spoken at home. The best forums to communicate information about a new CCS service, by order of highest use, are as follows (1) Spanish TV stations, (2) Spanish speaking radio stations, (3) English speaking TV stations, and (4) through Colonias Unidas. The typical household has two adults living in it, and the head of the household has not obtained a high school education or its equivalent. There are typically two children per household, with a fairly even distribution of children in all educational levels (K-12th grade). The average household income varies between \$13,000 (mean) and \$7,800 (median) a year. There is considerable stability in the area, with the typical household residing in the area for about eight years.

Some additional reduction in waste generation and PAYT revenues may be expected due to loss of some of the residential service base during migrant farmworker peak demand periods. Approximately 16% of the households surveyed indicated that they are gone for a portion of the year. Peak resident travel is between the months of June and September.

NARRATIVE CONCLUSION

The Starr County survey clearly shows that there is a strong interest among households within the three colonias to explore the CCS service *if* it is sufficiently *convenient* and *affordable*. Given our knowledge of other CCS programs within the state, it seems unlikely that Starr County would be able to run such a program on a full cost-recovery basis (taking into account both capital and operating costs). It seems highly likely that some general revenue funds or other County revenues would be needed to provide such a service. However, as our analysis shows, it may be possible to significantly off-set those general fund supplements for a CCS service through a PAYT or monthly fee service arrangement.

The only way to get a better idea of how much of the CCS expenses can be covered through grants and a PAYT user fees program is to develop some preliminary estimates based on alternative CCS servicing options (e.g., full private contracting, public-private partnership or full public provision of the CCS service). The TNRCC is completing a manual, *How to Plan, Design and Finance Citizens' Collection Stations*, to assist in such an endeavor. It provides a seven-step planning process to help localities generate some reasonable operating and capital cost estimates for a CCS service. While this process may take a few months to complete, careful attention to all the details outlined in the manual should help Starr County thoroughly and carefully assess all the pro's and con's of a CCS service so it can make an informed and prudent decision.

STATISTICAL SUMMARY OF SURVEY RESULTS

This section of the report provides a statistical breakdown of the survey results for each question. The exact question format is followed with the following descriptive statistics (where appropriate): the mean and median values (measures of central tendency); the standard deviation (a measure of dispersion); and the frequency and percentage distributions. Where dichotomous coding (1/0) was used, we simply report frequencies and the number of valid responses for those questions. Some questions were open ended, and we have provided a statistical breakdown on those open-ended responses where there was enough overlap in content to make reporting meaningful. The numerical coding scheme used to tally responses are noted for each question where a respondent's answer would be circled or checked for each question. The descriptive statistics reflect the coding scheme as noted for each question.

Following this introductory paragraph, Starr County's work group attached a copy of the survey showing how each question was coded and the descriptive statistics that were meaningful for that question. Rather than repeat the full survey here, we have selected results from Starr County's survey that represent the full range of question types—closed-ended and open-ended; word answers and number answers.

A Closed-Ended Question (Single Answer):

Do you ever have problems with odors or smoke from people burning household garbage in your neighborhood or from people dumping household garbage in your neighborhood?

[Read the following choices]

Coding Identifier = QU6

Number of Responses to Question = 243

Mean = 2.16 Median = 2

Standard Deviation = 1.03

	<i>Frequency/Percentage</i>
<u>4</u> Yes, often	28/11.5%
<u>3</u> Yes, sometimes	68/28%
<u>2</u> No, hardly ever	62/25.5%
<u>1</u> No, never	85/35%

A Closed-Ended Question (Multiple Answers Possible):

What did you do to dispose of your household garbage? **[Check all that apply]**

Coding Identifiers = QU12-QU20

	<i>Frequency</i>
<u>1</u> Bag the garbage	100
<u>1</u> Take the containers to the street	85
<u>1</u> Drive to the landfill	0
<u>1</u> Sort the trash	3
<u>1</u> Burn the garbage	1
<u>1</u> Bury the garbage	0
<u>1</u> Take recycling to a recycling center	0
<u>1</u> Find someplace to dump it	6
<u>1</u> Other	0

A Closed-Ended Question (Answer = Number):

How many bags of household garbage do you produce each week for a bag about this big? [**Hold up garbage bag and let respondent reply -- ask respondent to approximate if she/he hesitates.**]

Coding Identifier = QU7

Number of Responses to Question = 234

Mean = 4.70 Median = 4.0

Standard Deviation = 2.58

 # [how many, write the number of bags]

An Open-Ended Question:

How do you deal with disposing of each of the following types of household garbage?

[Read each of the following:]

	Aluminum Cans	Glass	Plastic
	Freq./Percent	Freq./Percent	Freq./Percent
No response	8/3.3%	41/16.7%	41/36.3%
Throw in trash	79/32.2%	197/80.4%	192/60.8%
Place in bags/collect	60/24.5%	5/2%	4/1.6%
Placed in bags for pick up	--/--	--/--	--/--
Recycle	25/10.2%	1/0.4%	--/--
Animals	--/--	--/--	--/--
County pick up	2/0.8%	--/--	--/--
Sell them	65/26.5%	--/--	--/--
Give them to neighbor to sell	5/2.0%	--/--	--/--
Keep it on the ground & it dries up	--/--	--/--	--/--
I burn it	1/0.4%	1/0.4%	3/1.2%
Utilize inside the house	--/--	--/--	--/--
I throw it outside	--/--	--/--	--/--
TOTAL	245/100%	245/100%	240/100%

	Newspapers	Cardboard	Fruits/Veggies	Yard Waste
	Freq./Percent	Freq./Percent	Freq./Percent	Freq./Percent
No response	45/18.4%	50/20.4%	34/13.9%	47/19.2%
Throw in trash	193/78.8%	186/75.9%	36/14.7%	144/58.8%
Place in bags/collect	--/--	4/1.6%	2/0.8%	21/8.6%
Placed in bags for pick up	--/--	--/--	--/--	12/4.9%
Recycle	2/0.8%	1/0.4%	--/--	--/--
Animals	--/--	--/--	172/70.2%	--/--
County pick up	--/--	--/--	--/--	15/6.1%
Sell them	--/--	--/--	--/--	--/--
Give them to neighbor to sell	--/--	--/--	--/--	--/--
Keep it on the ground & it dries up	--/--	--/--	--/--	1/0.4%
I burn it	4/1.6%	4/1.6%	1/0.4%	4/1.6%
Utilize inside the house	1/0.4%	--/--	--/--	--/--
I throw it outside	--/--	--/--	--/--	1/0.4%
TOTAL	245/100%	245/100%	245/100%	245/100%

A Closed-Ended Question with an Open-Ended Follow-Up:

Would it matter to you if you had to drive to the station instead of it being located at the entrance of your neighborhood?

Coding Identifier = QU60

Number of Responses to Question = 222

Mean = 1.6 Median = 2

Standard Deviation = .49

	<i>Frequency/Percentage</i>
<u>2</u> Yes	135/59
<u>1</u> No	94/41

Why?

	<i>Frequency</i>
No response	86
As long as it isn't too far from the colonia	16
Because it would be better to have a cleaner place and make the colonia cleaner/more sanitary	6
I wouldn't want it very close	3
To avoid the trash odor and the flies	28
More convenient/ easier	6
Less problems	3
To avoid problems with any neighbors	1
Because it is a benefit for me	2