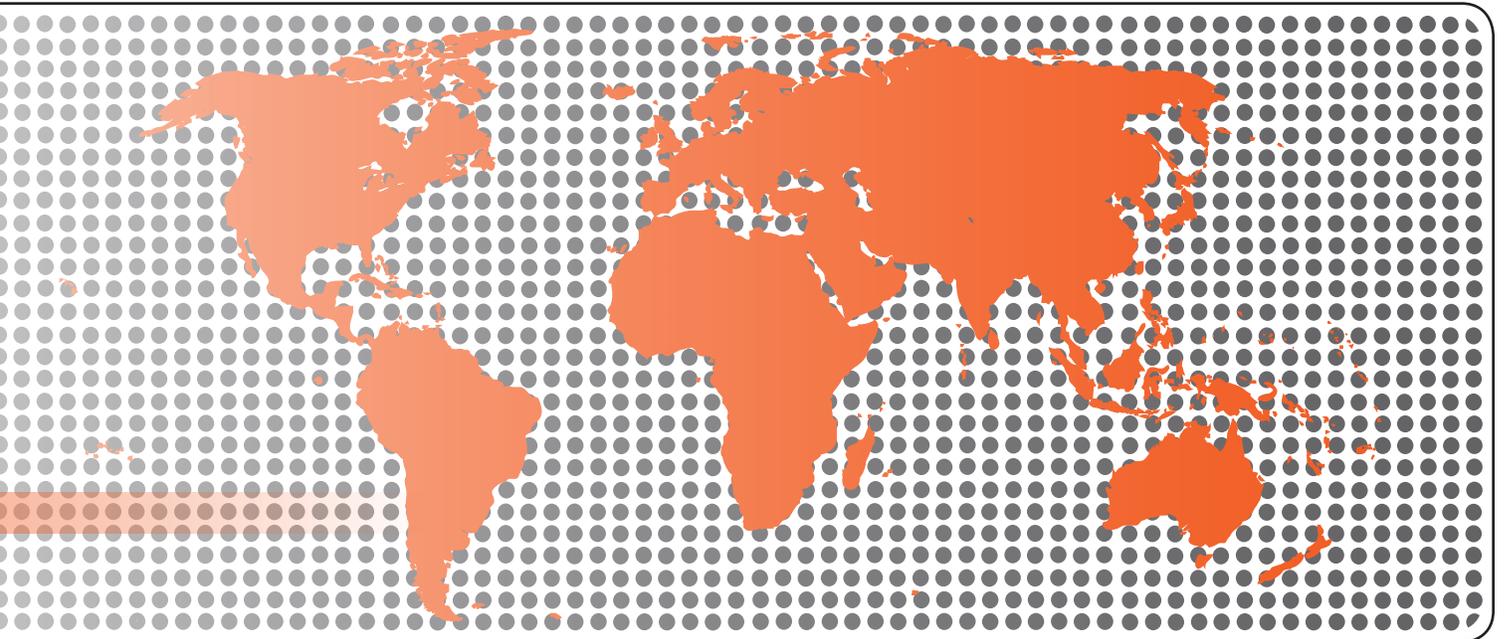


GTSS Global Adult Tobacco Survey (GATS)



## Mapping and Listing Manual





# **Global Adult Tobacco Survey (GATS) Mapping and Listing Manual**

Version 2.0  
November 2010

## **Global Adult Tobacco Survey (GATS) Comprehensive Standard Protocol**

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### **GATS Questionnaire**

Core Questionnaire with Optional Questions  
Question by Question Specifications

### **GATS Sample Design**

Sample Design Manual  
Sample Weights Manual

### **GATS Fieldwork Implementation**

Field Interviewer Manual  
Field Supervisor Manual  
Mapping and Listing Manual

### **GATS Data Management**

Programmer's Guide to General Survey System  
Core Questionnaire Programming Specifications  
Data Management Implementation Plan  
Data Management Training Guide

### **GATS Quality Assurance: Guidelines and Documentation**

#### **GATS Analysis and Reporting Package**

Fact Sheet Template  
Country Report: Tabulation Plan and Guidelines  
Indicator Definitions

#### **GATS Data Release and Dissemination**

Data Release Policy  
Data Dissemination: Guidance for the Initial Release of the Data

#### **Tobacco Questions for Surveys: A Subset of Key Questions from the Global Adult Tobacco Survey (GATS)**

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Disclaimer: The views expressed in this manual are not necessarily those of the GATS collaborating organizations.



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# 1. Introduction

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Tobacco use is a major preventable cause of premature death and disease worldwide. Approximately 5.4 million people die each year due to tobacco-related illnesses – a figure expected to increase to more than 8 million a year by 2030. If current trends continue, tobacco use may kill a billion people by the end of this century. It is estimated that more than three quarters of these deaths will be in low- and middle-income countries<sup>1</sup>. An efficient and systematic surveillance mechanism is essential to monitor and manage the epidemic.

The **Global Adult Tobacco Survey** (GATS), a component of Global Tobacco Surveillance System (GTSS), is a global standard for systematically monitoring adult tobacco use and tracking key tobacco control indicators. GATS is a nationally representative household survey of adults 15 years of age or older using a standard core questionnaire, sample design, and data collection and management procedures that were reviewed and approved by international experts. GATS is intended to enhance the capacity of countries to design, implement and evaluate tobacco control interventions.

In order to maximize the efficiency of the data collected from GATS, a series of manuals has been created. These manuals are designed to provide countries with standard requirements as well as several recommendations on the design and implementation of the survey in every step of the GATS process. They are also designed to offer guidance on how a particular country might adjust features of the GATS protocol in order to maximize the utility of the data within the country. In order to maintain consistency and comparability across countries, following the standard protocol is strongly encouraged.

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GATS manuals provide systematic guidance on the design and implementation of the survey.

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## 1.1 Overview of the Global Adult Tobacco Survey

GATS is designed to produce national and sub-national estimates among adults across countries. The target population includes all non-institutionalized men and women 15 years of age or older who consider the country to be their usual place of residence. All members of the target population will be sampled from the household that is their usual place of residence.

GATS uses a geographically clustered multistage sampling methodology to identify the specific households that Field Interviewers will contact. First, a country is divided into Primary Sampling Units, segments within these Primary Sampling Units, and households within the segments. Then, a random sample of households is selected to participate in GATS.

The GATS interview consists of two parts: the *Household Questionnaire* (household screening) and the *Individual Questionnaire* (individual interview). Both interviews are conducted using an electronic data collection device.

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The GATS interview is composed of two parts: *Household Questionnaire* and *Individual Questionnaire*. These questionnaires are administered using an electronic data collection device.

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<sup>1</sup> Mathers, C.D., and Loncar D. Projections of Global Mortality and Burden of Disease from 2002 to 2030. *PLoS Medicine*, 2006, 3(11):e442.

At each address in the sample, Field Interviewers will administer the *Household Questionnaire* to one adult who resides in the household. The purposes of the *Household Questionnaire* are to determine if the selected household meets GATS eligibility requirements and to make a list, or roster, of all eligible members of the household. Once a roster of eligible residents of the household is completed, one individual will be randomly selected to complete the *Individual Questionnaire*. The *Individual Questionnaire* asks questions about background characteristics; tobacco smoking; smokeless tobacco; cessation; secondhand smoke; economics; media; and knowledge, attitudes, and perceptions about tobacco.

## 1.2 Use of this Manual

After the final phase of geographic sampling is completed (i.e., the segment sampling stage), a listing of all households that reside in the final sample of geographic areas will be produced. Mapping and listing households is the preferred methodology, and this manual provides instructions for performing these operations. This chapter provides background information on GATS. **Chapter 2** describes the specific survey goals and objectives and the population to be surveyed. **Chapter 3** provides information about the survey design and its four sampling stages. **Chapters 4** and **5** describe your responsibilities and provide detailed instructions for mapping and listing sampled segments. Adherence to prescribed procedures and duties is extremely important to the success of this survey.

## 2. Survey Objectives and Target Population

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### 2.1 Survey Objectives

GATS will provide nationally representative estimates of tobacco-related behaviors associated with persons 15 years of age or older. The survey might also produce estimates for the following subgroups:

- Gender
- Urban and rural populations.

The survey questionnaire elicits information from respondents concerning:

- Tobacco smoking
- Smokeless tobacco
- Cessation
- Secondhand smoke
- Media
- Knowledge, attitudes, and perceptions.

### 2.2 Target Population

The population of interest for GATS is all noninstitutionalized persons 15 years of age or older who reside in the country. To ensure that the data analyses resulting from the survey are representative of the entire population of persons from that age group, it is essential that all eligible individuals be afforded some probability of being selected. This means that the survey sample must be executed as inclusively as possible, ensuring that all households (and persons within the households) are included. It is not acceptable to exclude residences (or persons) for arbitrary reasons. Any exceptions to this requirement (for example, an area of armed conflict) must be approved in advance by the Principal Investigator/Survey Director, and detailed documentation must be prepared and maintained at survey headquarters.

The exact definition of the target population for this survey is described in the ***GATS Sample Design Manual, Chapter 3***. A summary of this definition, as well as the definition of a household, are provided below.

### 2.3 Definition of Target Population

As noted above, the target population for GATS includes all men and women 15 years of age or older. This target population includes all people who consider the country to be their usual place of residence. This definition includes those individuals residing in the country even though they may not be considered a citizen of the country. The only adults 15 years of age or older who will be excluded from the survey are those individuals:

- visiting the country (e.g. tourists),
- who indicate their usual place of residence is a military base or group quarters,
- who are institutionalized—including people residing in hospitals, prisons, nursing homes and other such institutions.

In general, the target population of GATS should include individuals residing in all geographic areas of a country. There may be some exceptions to this. Extreme remote areas or areas that cannot be visited due to war, political unrest etc. can be excluded from the target population provided a significant proportion of the country's population do not reside in these areas. Each country should explicitly define which geographic areas of the country are included and excluded from the target population of GATS and estimate the percent of the population that resides in those areas being excluded. This percentage will provide an evaluation of the potential for coverage bias in the country's final GATS estimates.

## 2.4 Definition of a Household

The concept of a "household" can vary widely among countries and even among researchers within a country. In order to maintain consistency between countries, a household will be defined for GATS in a manner that is consistent with the definition created by the United Nations (UN) and documented in their report *United Nations: Principles and Recommendations for Population and Housing Censuses*. In this report, the UN defines a household<sup>2</sup> as:

"Either a one-person household, defined as an arrangement in which one person makes provision for his or her own food or other essentials for living without combining with any other person to form part of multi-person household or a multi-person household, defined as a group of two or more persons living together who make common provision for food or other essentials for living. The persons in the group may pool their incomes and have related or unrelated persons or a combination of persons both related and unrelated. This arrangement exemplifies the housekeeping concept. In an alternative definition used in many countries exemplifying the so-called household-dwelling concept, a household consists of all persons living together in a housing unit."

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<sup>2</sup> This definition of a household was taken from [http://unstats.un.org/unsd/cdb/cdb\\_dict\\_xrxx.asp?def\\_code=327](http://unstats.un.org/unsd/cdb/cdb_dict_xrxx.asp?def_code=327).

### 3. Survey Design Requirements

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This chapter identifies the sequential statistical sampling stages that must be performed to properly field GATS. Each stage is briefly described so that you may be aware of the precise and detailed sampling processes that preceded your involvement with GATS. These stages also underscore the importance of your work in correctly executing all sampling-related assignments.

GATS is designed as a multistage area household survey with geographic areas selected in one or possibly several stages of selection. Those countries that will select their areas in one stage of selection can skip **Section 3.2**—in this case the geographic segment is the first stage of selection and consequently the primary sampling unit for the country.

#### 3.1 Primary Sampling Units Formation

[COUNTRY] has been divided into **XXX** large geographical areas for which survey data can be obtained. These areas are called Primary Sampling Units (PSUs), and they are shown in **Exhibit 3-1**.

##### **Exhibit 3-1. Map Showing Country Divided into PSUs**

[INSERT COUNTRY-SPECIFIC MAP]

#### 3.2 PSU Selection (If Applicable)

A statistical method was employed to select a random sample of the PSUs that will be included in the data collection phase of the survey. The selection procedure allowed PSUs with larger populations to have a greater chance for inclusion than PSUs with smaller populations. Most countries will have at least 100 selected PSUs. **Exhibit 3-2** shows the selected PSUs for the GATS.

##### **Exhibit 3-2. Map Showing Selected PSUs**

[INSERT COUNTRY-SPECIFIC MAP]

Following selection of the PSUs, areas within each selected PSU were divided into smaller geographic areas called segments,

#### 3.3 Segment Selection

The final geographic unit selected for GATS is the geographic segment. As with all stages of selection in the GATS design, segments were selected *randomly*. In some countries, neighborhood segments may be constructed according to some recognized geopolitical units. **Exhibit 3-3** shows an example of the selected segments within your country.

##### **Exhibit 3-3. Map Showing Selected Segments within a PSU**

[INSERT COUNTRY-SPECIFIC MAP]

### 3.4 Segment Mapping and Listing

Following selection of the segments, it is necessary to map and list all structures within each segment. After the list of structures is constructed, some will be sampled for inclusion in the data collection phase. In most countries, there will be approximately 250 households within a segment.

**Note:** The mapping and listing procedures will be your responsibility to execute, and they are described in depth in later chapters.

### 3.5 Rostering of Households and Selection of Survey Participants

A roster of persons 15 years of age or older who reside at each sampled household will be prepared. Following completion of this task, one person 15 years of age or older will be randomly selected for participation in the survey.

**Note:** Compiling the roster of persons who reside in the household and the random selection of one person for participation will be the responsibility of the field interviewer to execute, and the procedures for completing that assignment are included in the *GATS Field Interviewer Manual*.

## 4. Performing Your Responsibilities—Getting Started

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### 4.1 Overview

This chapter provides summary and detailed instructions to enable you to perform the sampling procedures that will facilitate the enumeration (mapping) and recording (listing) of structures within your assigned sampled segments. These procedures represent a critical step in assuring the accuracy of the entire GATS. If these responsibilities are not performed correctly, the entire sample may be adversely impacted, which in turn may negatively impact the survey results such as introducing bias. As you can see, you are a very important contributor to the quality of the survey.

Your responsibilities in this area include:

- Locating your assigned segment areas and planning the best travel routes within them.
- Determining the precise boundaries of each of your assigned segments.
- Mapping and numbering structures in each segment.
- Indicating the location of each structure on a map that defines the boundaries of the segment.
- Listing the address or description of each structure.

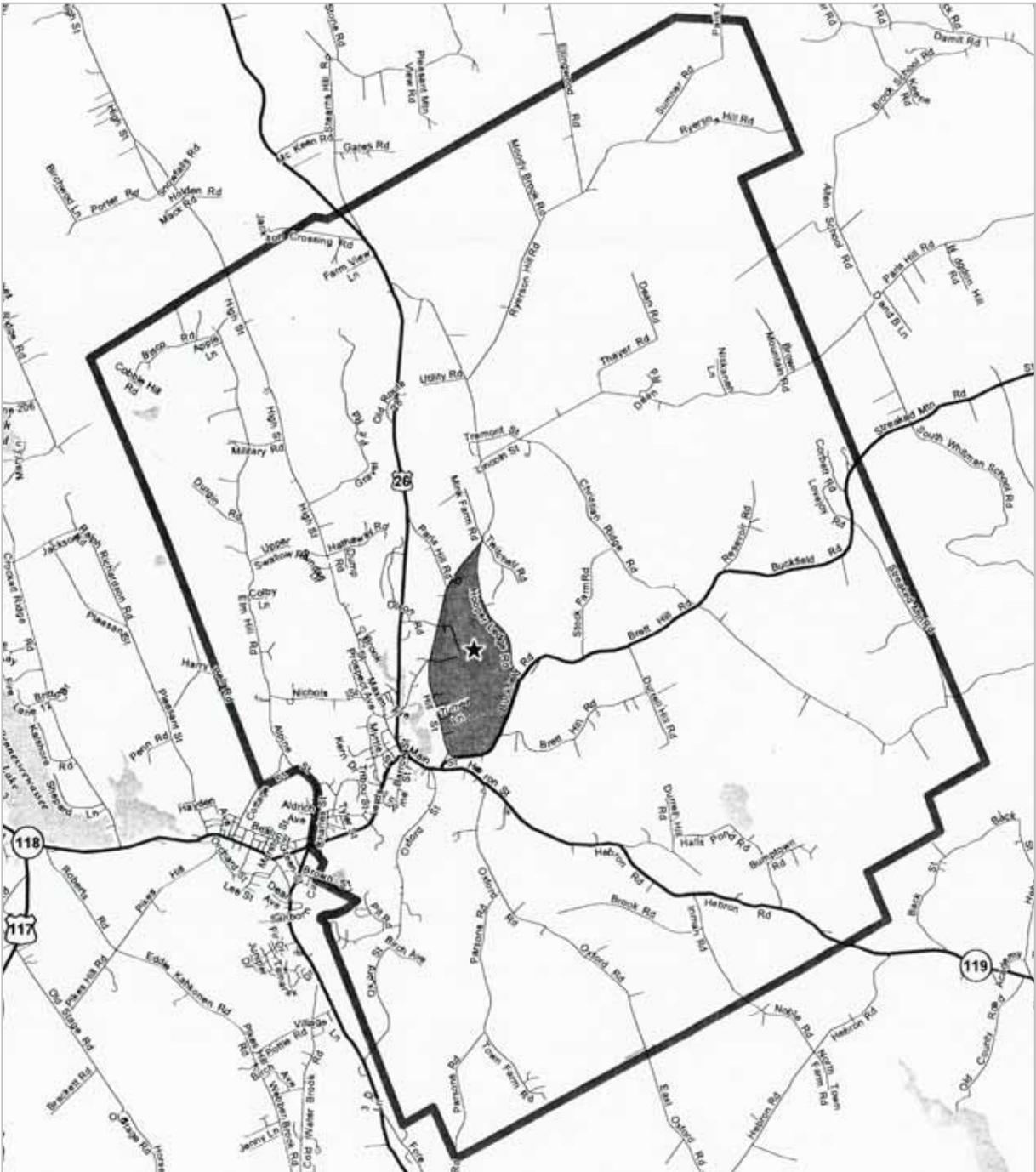
The procedures for completing the first two of these responsibilities are contained in this chapter. Instructions for completing the specific mapping and listing responsibilities are provided in Chapter 5.

### 4.2 Locating Assigned Segment Areas

Your supervisor will provide a base map of each segment assigned to you. This will help you to recognize the precise boundaries of the segment. It is essential that you carefully study the base map as you prepare for fieldwork so that you are familiar with the area within the segment. In the field, you must be able to easily transfer your paper knowledge to the three-dimensional world in which you operate. The better prepared you are, the easier this transition will be, and the better the quality of the entire GATS.

An example of a base map is shown in **Exhibit 4-1**. As you can see, the specific area of the sampled segment is clearly delineated, and this is the geographical territory within which you will conduct the GATS.

Exhibit 4-1. Example of a Base Map (Assigned Segment is Shaded Area)



### 4.3 Continuous Path of Travel

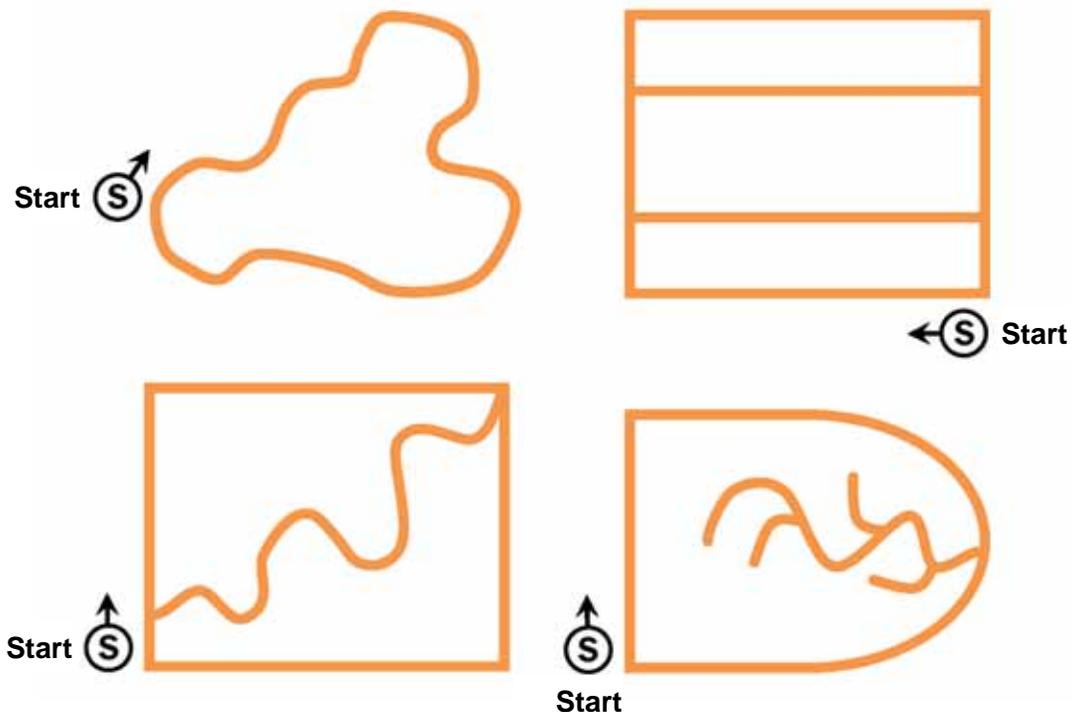
After you are certain of the location of the sampled segment and its defined boundaries, you must determine the most efficient and thorough way to travel the roads and byways of the segment. When traveling within the segment, you must completely cover every side of every street and roadway within the entire segment, always looking for structures on one side of the street. For the sake of convenience, this manual will always use the right side. All boundaries of the segment must be followed (including railroad, water, power lines, and non-visible boundaries) because they may contain structures. This is called a *continuous path of travel*. For maps that show blocks with straight streets organized into standard blocks, this path is fairly straightforward. However, for blocks with many intersections with odd angles and internal areas, it can become rather complicated. The rules for properly covering a segment are described below.

Use the map to determine the best path of continuous travel within the segment. If feasible, it will be beneficial to travel the boundaries of the segment prior to performing your mapping and listing responsibilities.

#### 4.3.1 Starting Point

Always begin your travel at a logical starting point. The starting point may be an intersection of two boundaries of the segment, usually a corner, which seems most appropriate considering the types of boundaries and the layout of streets. **Exhibit 4-2** shows examples, with “s” representing the starting point and all lines representing streets, roads, paths, etc.

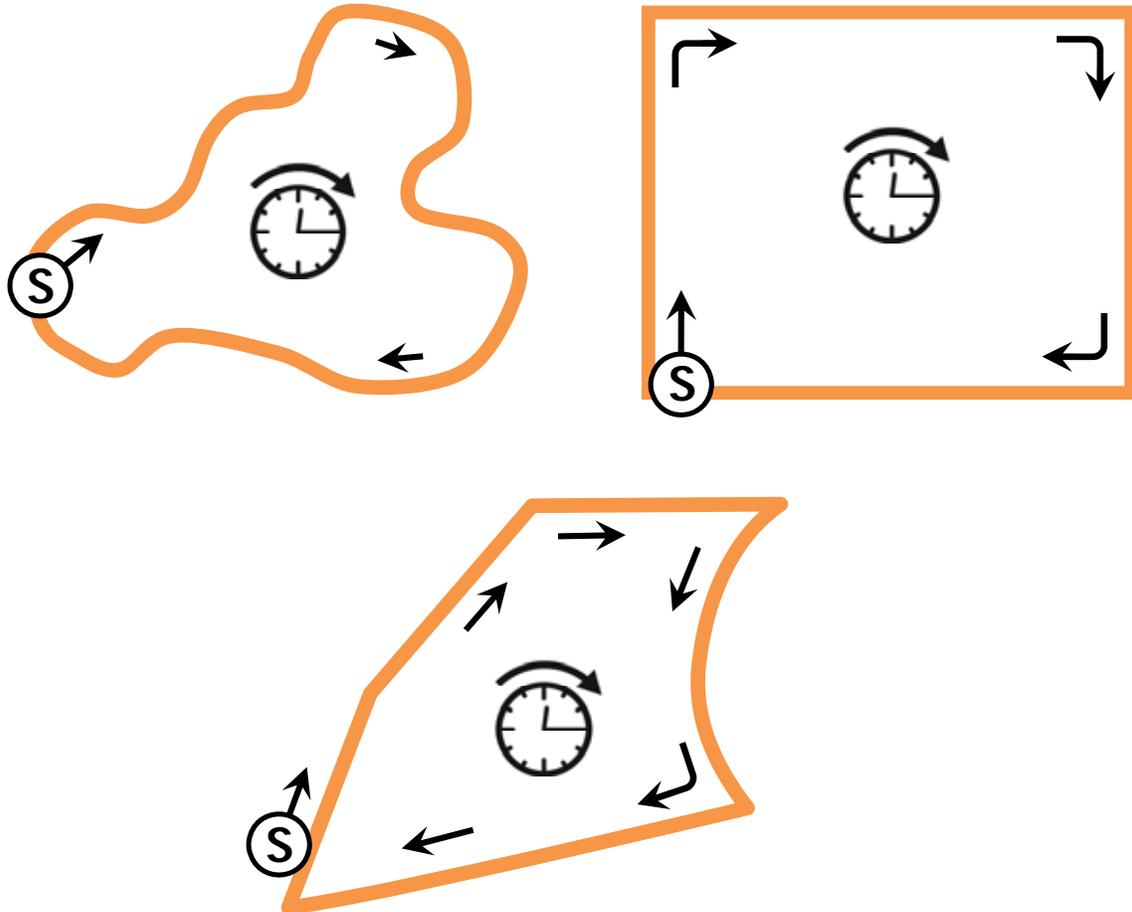
**Exhibit 4-2. Examples of Starting Point Locations**



### 4.3.2 Travel Clockwise

Travel the segment in a clockwise direction. As you travel clockwise from the starting point, draw arrows on the map to indicate your path of travel. Marking your path helps you be sure to cover every street, mapping and listing structures *on your right*. The arrows help you to remain focused while you are in the field and help other survey staff later when they verify your path of travel for quality control purposes. Simple examples of marking the clockwise path of travel are shown in **Exhibit 4-3**.

**Exhibit 4-3. Examples of Marking Clockwise Path of Travel**

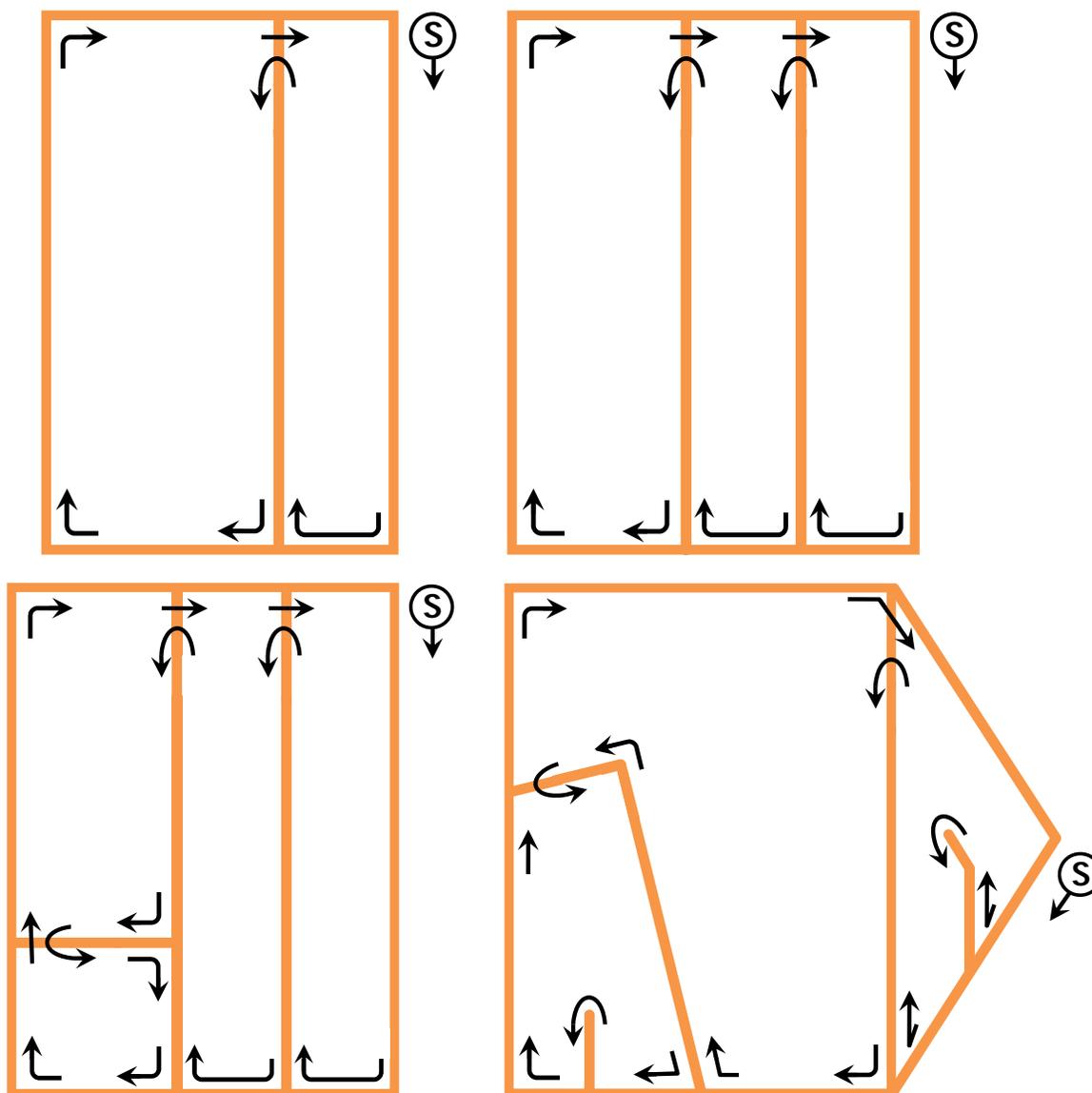


### 4.3.3 Make Right Turns

As you travel clockwise from the starting point, *make each possible right turn*. When you come to a road, street, or trail, make a right turn and travel that road, mapping or listing structures *on the right side*. If you travel on a road that comes to a dead end, turn around so you travel in the opposite direction on the same road, still mapping and listing units *on your right*. Your path of travel along a street is not influenced or changed if the street is designated as a one-way street for traffic. Shown in **Exhibit 4-4** are some examples of making all possible right turns.



**Exhibit 4-5. Examples of U-turns at Segment Boundaries**

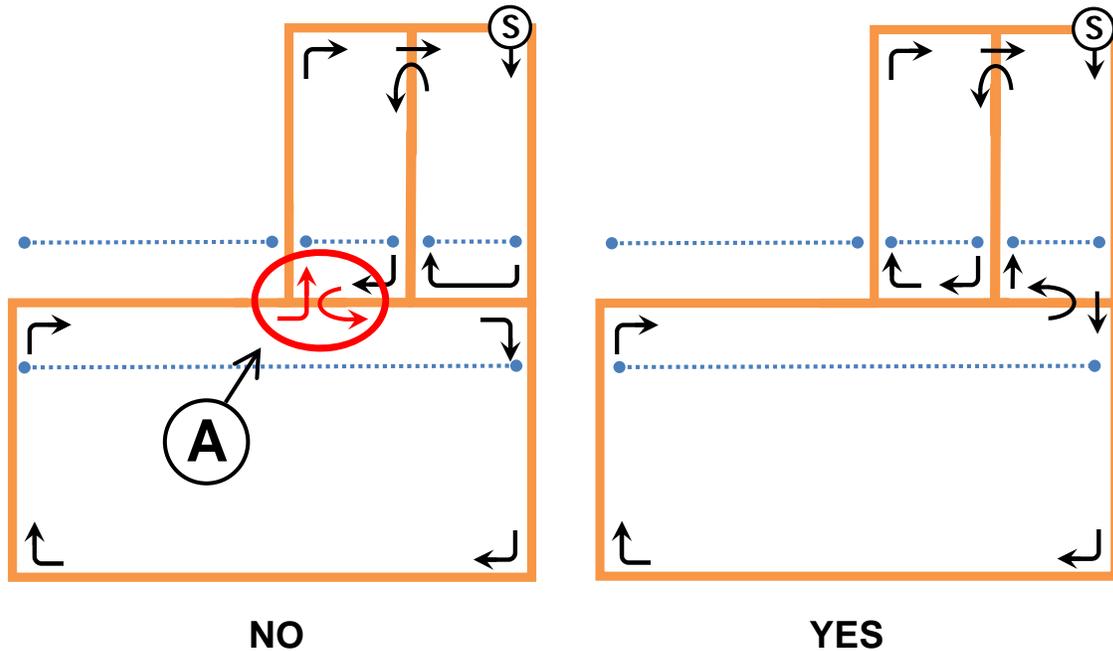


#### **4.3.5 Do Not Break Street Sections**

A *street section* is the portion or section of a street that is between two intersections or between an intersection and the end of a street. This means that if you start at an intersection of two streets and travel along a street, you will continue on that same street until the street dead ends or you encounter another intersection—one that completely crosses the street, or one that intersects to your right. If the intersecting street intersects only on the left side of the street on which you are traveling, that intersection does not break the street section.

It is important that street sections be traveled continuously so that the staff performing quality control at later stages can replicate your path of travel. Right-hand turns within themselves do NOT break street sections, although you might have to bypass a right-hand turn in order not to break a street section. Making a U-turn at an inappropriate time or making a left-hand turn constitutes breaking a street section. **Exhibit 4-6** is an example of street sections and how to travel them to prevent the breaking of the street section.

**Exhibit 4-6. Examples of Continuous Travel of Street Sections**



In the example above, the problem with the “No” path is that the U-turn made at point “A,” as well as the subsequent left-hand turn made at point “A,” forces you to break a street section. In both of these examples, the long, straight line represents the south side of the street and represents one continuous street section. The three smaller lines represent the north side of the street, which consists of three separate street sections. By making the U-turn at point “A,” you are now traveling on the south side of the street and you have broken the south side of the street’s continuous street section. By making this U-turn, you will have not traveled the south side of the street continuously. Also by making this U-turn, you are forced to make a left turn again at point “A” to travel the entire segment. By making the U-turn and the subsequent left-hand turn, you cannot be assured that you have not missed structures in the surrounding area.

In the “Yes” example, although you bypass a right-hand turn, you travel the whole of the street segments in a continuous manner. You travel the entirety of the south side of the street without having to “break” the street in half. You also are able to travel each of the three street sections on the north side of the street without having to “break” those.



## 5. Mapping and Listing

---

As indicated in **Chapter 1**, each country that participates in GATS will have unique circumstances, situations, and idiosyncrasies that must be addressed prior to executing the mapping and listing operation. Your supervisor will provide instructions on how to handle these unique situations.

### 5.1 Introduction

The critical mapping and listing function requires an in-person visit to each selected segment to create a map that depicts all the households within the segment and to record a description of each household. A two-person team will be appointed and trained to perform the mapping and listing operation; one person will prepare the map while the other prepares the listing. Each team member will do his or her work at the same time as the other.

### 5.2 Households

#### 5.2.1 Inclusions

People live in many types of structures and residences, such as single-family homes, apartments, shelters, boats, and tents. If GATS is to fulfill its objective of providing valid national survey estimates for the entire population of persons 15 years of age or older in [COUNTRY], it is essential that all persons who live within the sampled segments have a chance to be selected. Therefore, it is incumbent upon you to identify all the households and residences in each assigned segment.

#### 5.2.2 Exclusions

The only exceptions to the above requirement are institutional settings. Persons who reside in institutions are not eligible to participate in GATS. An institution is a place where many people reside in a collective setting. Following are some examples of institutions:

- Correctional (jail, prison, penitentiary, reformatory)
- Homes for the aged, infirm, or needy (children's home, home or school for the blind, orphanages, soldiers' or sailors' home)
- Mental facilities (hospital, addiction treatment center, training school for mentally handicapped)
- Collective living arrangements, such as hostels, dormitories, and military barracks.

You should always consult your supervisor if you are uncertain whether a facility is an institution.

### 5.3 Materials Required

The following materials are required for mapping and listing a segment:

- Mapping and Listing Manual
- Base map
- Mapping forms
- Segment sketch forms
- Household listing forms
- Subsegment control forms
- Supervisor's telephone number and e-mail address (if the supervisor has an e-mail address).

## 5.4 Mapping

This section describes the responsibilities of the mapper. As noted above, the two-person team must travel through the segment together and work as a team to execute their assignments.

The Segment Locator Map (see **Exhibit 5-1**) will be used to prepare a detailed map of the segment. Before initiating travel within the segment, the mapper will complete the identifying information at the top of the form. Your supervisor will provide the information required for completion of this section of the form. Then, in the space provided, the mapper will create a map that shows the segment boundaries and all interior streets and physical features. This map will enable the field interviewers who perform data collection in this segment to be certain they are working in the proper area, and it will also serve as a quality assurance tool for your supervisor.

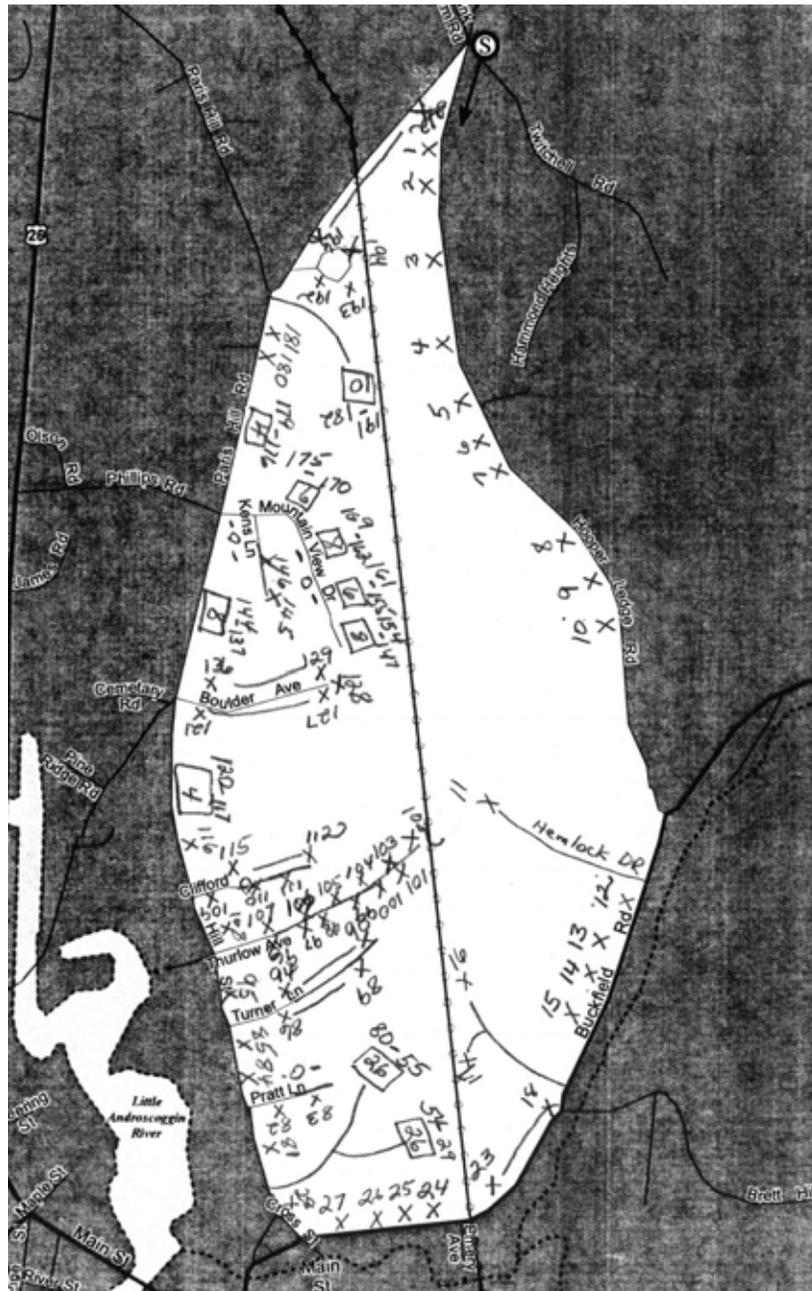
**Exhibit 5-1. Segment Locator Map**

IDENTIFICATION				
PSU <table border="1"><tr><td>1</td><td>0</td><td>7</td></tr></table>	1	0	7	LISTER NAME <u>ROBERT ANTHONY</u>
1	0	7		
SEGMENT <table border="1"><tr><td>0</td><td>3</td></tr></table>	0	3	MAPPER NAME <u>DONALD SERAPHIS</u>	
0	3			
PROVINCE/STATE <u>MAINE</u>	DATE <u>12 DECEMBER 2007</u>			
COUNTRY/VILLAGE <u>OXFORD</u>				
URBAN/RURAL <u>RURAL</u>				
LOCALITY <u>SOUTH PARIS</u>				

LOCATION MAP OF CLUSTER

The mapper also will prepare the Segment Sketch Form (see **Exhibit 5-2**) that identifies and consecutively numbers all structures within the segment. Enter an “S” on the form to designate your starting point. Then, draw a small “X” to depict the location of each single-household dwelling or a small square—“□”—to identify the location of each multiple-household dwelling (e.g., a building with several apartment units). Enter the sequential number of the household above each “X” or “□,” as shown in Exhibit 5-2. Note that for single-family households, one number appears above each “X;” for the multiple-household dwellings the range of sequential numbers appears above each “□” (e.g., 29-54) and the total number of households in the dwelling is inserted inside the square (e.g., 26). It is of critical importance to ensure that each household within the entire segment is included on the Segment Sketch Map.

**Exhibit 5-2. Segment Sketch Form**



## 5.5 Listing

While the mapper completes the responsibilities described in **Section 5.4**, the lister will complete the GATS Listing Form (see **Exhibit 5-3**) to record all households in the segment. The GATS Listing Form contains six columns:

**Exhibit 5-3. GATS Listing Form (Page 1 of 8)**

		IDENTIFICATION	
PSU <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>		Lister Name: <u>Robert Anthony</u>	
Segment <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>		Mapper Name: <u>Dannah Seraphis</u>	
Province/State <u>MAINE</u>		Date: <u>12 December 2007</u>	
County/Village <u>Oxford</u>			
Urban/Rural <u>Rural</u>			
Locality <u>South Paris</u>			

### Column 1 – Line Number.

Enter numbers sequentially so that they correspond precisely with the sequential households depicted on the Segment Sketch Map.

### Column 2 – Office Use.

Make no entries in this column.

**Columns 3, 4, and 5** are provided for you to enter the street number, street name, and apartment designation (if applicable).

### Column 6 – Description.

Use this column when no specific address is observed for a household.

1 LINE NUMBER	2 OFFICE USE	3 STREET NUMBER	4 STREET NAME	5 APT NUMBER	6 DESCRIPTION
1		301	Hooper Ledge Road		
2		303			
3		305			
4		307			
5		309			
6		311			
7		313			
8		315			
9		317			
10		319			
11		115	Hemlock Drive		
12		2105	Buckfield Road		
13		2109			
14		2113			
15		2117			
16			ALLEN LANE		White house with FLAT roof
17		23	Leas Place		
18		2249	Buckfield Road	A	
19				B	
20				C	
21				D	
22				E	
23				F	
24		2307			
25		2309			

The team must always be alert to identify occluded or out-of-the-way structures that may contain households. If you are in doubt about a situation, you may ask local residents whether a structure serves as a household. If it does, it must be included on the Segment Sketch Map and the GATS Listing Form.

## 5.6 Subsegmenting Large Segments

Subsegmenting is a statistical process used to reduce the size of a segment that contains an unusually large population of residents. Subdividing the segment into subsegments reduces the work, time, and expense necessary for the Mapping and Listing Team to perform its responsibilities.

When subsegmenting is necessary, your supervisor will identify the segment involved and inform you of the number of subsegments to be formed within it. The following are the steps involved:

1. As with any segment, use the base map and other resources to identify its precise boundaries.
2. To divide the segment into segments, you should attempt, if possible, to create subsegments that are approximately equal in terms of the number of households.
3. Clearly delineate the physical boundaries of the subsegments on the Segment Locator Map.
4. Number the subsegments in sequential order.
5. Estimate the size of each subsegment by traveling through it, counting the approximate number of households, and recording the total for each.
6. Determine the percentage of households that each subsegment contains. For example, if 4 subsegments are required, and Subsegment 1 has 138 of the 600 households in the segment, it has 23 percent. If Subsegment 2 has 156 households, it has 26 percent. If Subsegment 3 has 144 households, it has 24 percent. And if Subsegment 4 has 162 households, it has 27 percent. Cumulatively, the percents must total 100.
7. On a GATS Subsegment Control Form (see **Exhibit 5-4**), enter the size of the subsegments in the appropriate columns and determine the specific and cumulative percents.
8. Your supervisor will preassign a random number that will be indicated on the Subsegment Control Form. Compare this number with the cumulative percent column on the form. The first subsegment number with a cumulative percent equal to or greater than the random number is the subsegment selected for the survey.
9. As with any other segment, the mapper then will complete the Segment Sketch Form and the lister will complete the GATS Listing Form **for the selected subsegment**.

**Exhibit 5-4. GATS Subsegment Control Form**

**NUMBER OF SUBSEGMENTS TO BE CREATED**

Subsegment Number	Number of dwellings	Percent	Cumulative percent
1	138	23%	23%
2	156	26%	49%
3	144	24%	73%
4	162	27%	100%
5			
6			
7			

**RANDOM NUMBER BETWEEN 1 AND 100:**

**SEGMENT SELECTED:**

**5.7 Quality Control**

The importance of performing the Mapping and Listing operation with utmost care cannot be overemphasized. To this end, your supervisor will assign another individual to perform an independent mapping and listing of a sample of your segments. If the work you have completed falls below the acceptable quality threshold, your work will have to be redone





**GLOBAL TOBACCO SURVEILLANCE SYSTEM (GTSS)**

