

HUD CDBG Income Survey Toolkit

Conducting Local Income Surveys in the Community Development Block Grant (CDBG) Program

User Guide: ArcGIS Survey123

Note: Refer to Appendix A in the CDBG Income Survey Guidebook for approximate costs for this data collection method.

1. Introduction

This user guide supplements the Guidebook: *Conducting Local Income Surveys in the Community Development Block Grant Program* and provides one option for a data collection tool. For more information refer to the Guidebook and the [Community Development Block Grant \(CDBG\) Income Survey Toolkit](#) (Toolkit).

ArcGIS Survey123 is a web- and app-based data collection program that is designed to collect responses both in person on an electronic handheld device and through a web-based form that a respondent can fill out on their own device (e.g., computer, tablet, or smart phone). Surveys can have skip patterns, embedded data, and many other features.

This guide provides step-by-step instructions for using a preprogrammed Survey123 template to capture income in a local area. You must have a license for ArcGIS and the Field Tools bundle, which includes Survey123, to use this program.

2. Preparing to Use Survey123

Survey123 can be accessed in two ways:

- Via the website at <https://survey123.arcgis.com/>.
- Via Survey123 Connect for ArcGIS, which can be downloaded at <https://www.esri.com/en-us/arcgis/products/survey123/resources>.

The income survey was developed with the Survey123 Connect tool, not the web-based survey builder. Survey123 Connect allows for embedded data, while the web-based version does not. You can use the survey that the U.S. Department of Housing and Urban Development (HUD) developed as a template and add details for your area, such as the name of the location and the appropriate income levels.

When Esri updates Survey123 Connect, they sometimes move certain elements. Updates to the program may cause some links to be in different places than indicated in this user guide. This guide is based on version 3.13.251. Earlier versions have the same capabilities.

Download and install the Survey123 Connect desktop application before the next step.

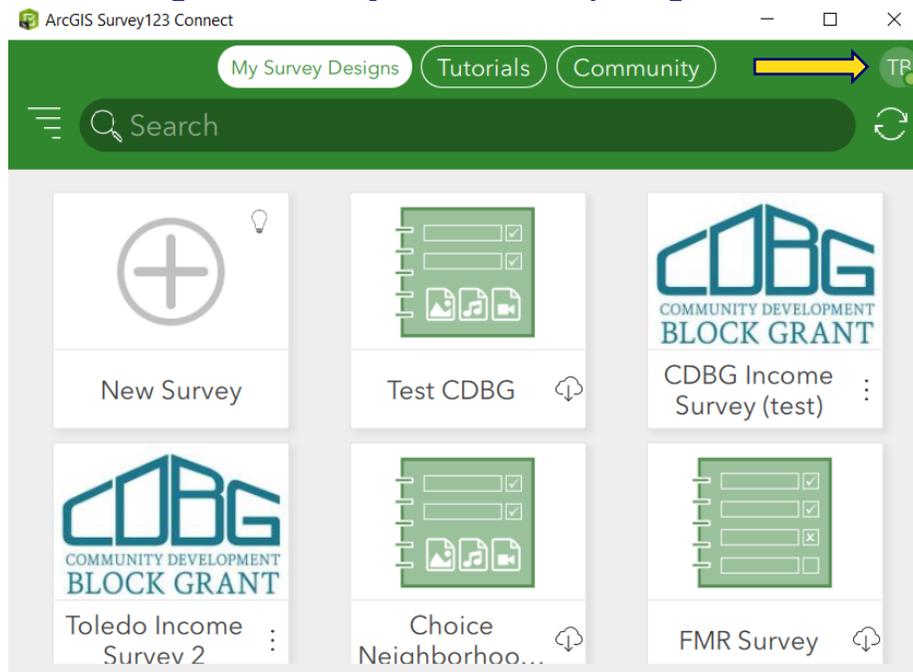
3. Save the Survey Template to Local Drive

Before you can modify the survey, you must first download it from the Toolkit and save the “Survey123 elements” folder on your local drive where the Survey123 program can access it. The following instructions are for Microsoft Windows; there may be slight differences in other operating systems.

The next steps explain how to find the correct place to save the Survey123 elements folder so you may open the survey and modify it for your area.

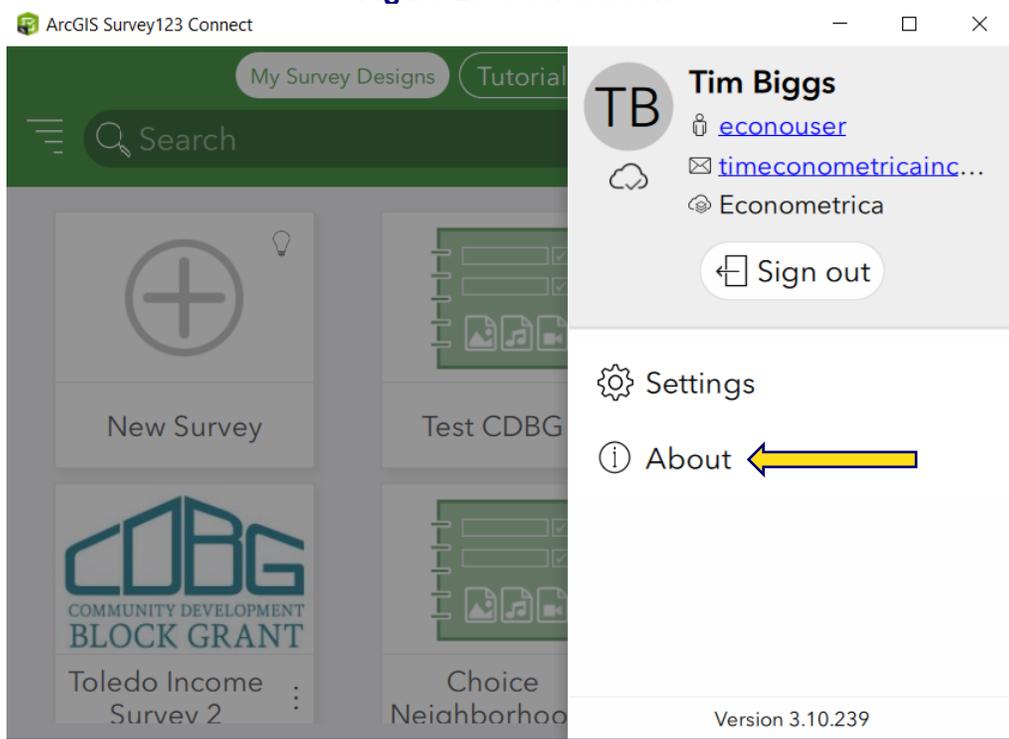
1. Download the [“Survey123 elements” folder](#) from the Toolkit. If the folder is compressed, uncompress it and save it where you can find it easily.
2. Open Survey123 Connect on your desktop. Navigate to the “survey designs path” by following the next steps.
3. Click the button in the upper right-hand corner, which will have the user’s initials, or click the three horizontal lines if you see those. In Figure 1, the initials are “TB.” Alternatively, if you see an “Info” button on the left-hand side of the screen, you may click there and navigate to the “About” section.

Figure 1. Survey123 Connect Opening Screen



4. After clicking the initials, three lines, or the Info button, you will see a screen similar to the one in Figure 2.

Figure 2. User Screen



5. Click “About,” which will bring up the scrollable window shown in Figure 3. Scroll all the way to the bottom to find a link to the “Survey designs path” shown in Figure 4.

Figure 3. “About ArcGIS Survey123 Connect” Screen

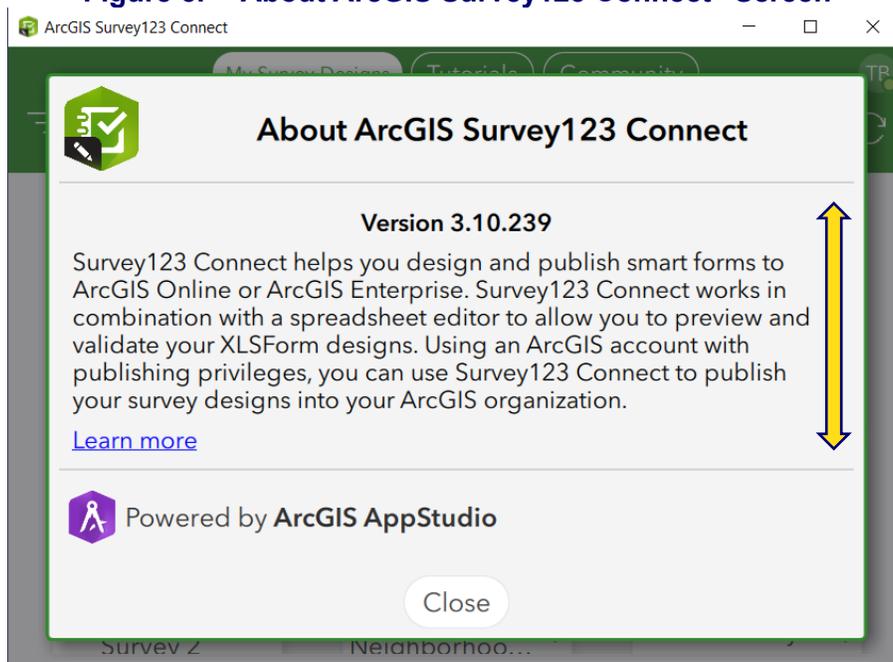
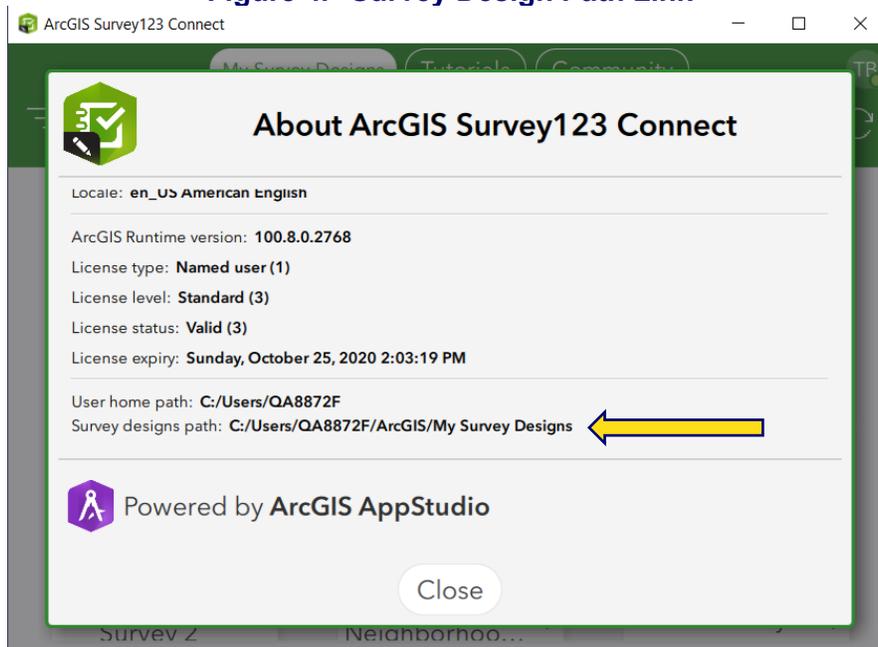


Figure 4. Survey Design Path Link



6. Click the address next to “Survey designs path” to open the Survey Design folder. The name of the folder will be similar to “~.ArcGIS/My Survey Designs/”.
 - o In the place of “~” will be the name of your local drive, which is different for each user.
7. Copy and paste the uncompressed “Survey123 elements” folder into the Survey Design folder.
8. Close and reopen Survey123 Connect OR reload the program by clicking the image of the circular arrows 
 - o Some versions of Survey123 may not have the arrows—in that case close and reopen the program to see the survey.
9. The survey template should now appear on the home screen of Survey123 Connect.

4. Update the Survey Template for the Local Area

Survey123 Connect allows you to modify the survey and create new surveys, but it cannot be used to fully test the instrument. To review the survey template, enter “SOS” in the ID box, then scroll through to see the questions as they would appear to a survey respondent (field is case sensitive).

4.1. Save a New Copy of the Survey

Saving a new copy of the survey will allow you to keep a clean copy of the template in case you need to start the process over. To save a new copy:

1. On the opening screen, click on the three lines or dots next to the sample survey.

2. Choose “Save as” or “Create a new survey” (will depend on the version of Survey 123 being used).
3. Provide a new name for the survey.

4.2. Open the XLSForm Spreadsheet

1. Open the survey. On the left side of the screen, select the folder icon, which represents the Survey Designs folder. This will take you to the following location: C:\~\ArcGIS\My Survey Designs\[new saved name].
2. From the Survey Designs folder, open the Microsoft Excel file with the name you gave the survey in step 4.1.
 - This is the XLSForm that must be modified to customize the survey for the local community.
 - If a popup window opens and asks you to “update” links to external sources, chose the “Don’t Update” option.
3. In the “Survey” tab of the Excel file, search for “[Community]” and replace it with the name of the city/town where the survey will be conducted. Instances of “[Community]” can be found in both the “label” and “label:Español” fields.
 - “[Community]” can be found in Column C, Rows 3 and 48.
4. In the “Settings” tab, add the community/survey name in the “form_title” field.
5. A Spanish translation of the survey is included. To update this translation:
 - Scroll to the right and find column P: “label::Espanol(es).”
 - Make any necessary edits, such as changing the name of the community from [Comunidad].
 - You may also add additional columns for other languages.
6. Save and close the Excel file. The new file name will appear in the Survey123 Connect window.

4.3. Update Files With LMI, Addresses, and Unique IDs

Details about how to generate the unique (family) IDs discussed in this section may be found in the Sampling chapter of the CDBG Income Survey Guidebook (Chapter 4, pages 13–14). Chapter 4 also contains information about how to develop the address list (Section 4.2, Preparing the Sampling Frame). The sampling frame is the list of addresses that will be used to draw the sample for the survey. All non-vacant residential addresses should be included in the “id_check” file in case additional sample is added.

The next step will update the underlying files that contain low- and moderate-income (LMI) data, sample addresses, and the unique IDs. To get the most recent CDBG Income Limits, visit the [HUD](#)

[Exchange website](#). You will navigate to these files via the Survey123 Connect desktop program. There are two key files that control the data that is accessed in the survey:

1. “lmidata” contains the local area’s moderate-income limit for family sizes up to eight.
2. “id_check” contains a list of the three unique IDs and each address in the sampling frame.

To edit the data files:

1. Open the files in a text editor. Avoid using Excel because it will add blank lines at the bottom of file, which will cause an error when Survey123 attempts to read the data.
 - o To open in a text editor in Windows, right click the file name, then choose “Open with” and select “Notepad.”
2. In the Survey Connect program, open the folder with the data files for your survey. This folder can be accessed by clicking on the survey folder in the main window of Survey123 Connect and then choosing “files” on the left side of the page.
3. Open the Media folder. You will see the “lmidata” and “id_check” files.
4. After editing the files as explained below, save and close them.

4.3.1. Adding the LMI data

1. Open the “lmidata” file. **Note: Any data in the “lmidata” file must be replaced with the income limits for your area.**
2. The first row of the file defines the elements of the data: “family_count” and “income”: family_count,income. Do not delete or change the first row of the file.
3. Add rows for family sizes of one to eight.
4. Each row contains the income associated with a family size, such as “1, 35000.”
 - o **NOTE:** The program will calculate income levels for family sizes of nine or larger. Only add data for family sizes from one to eight .
5. Save and close the file.

4.3.2. Adding the Unique IDs and Addresses

*For this part of the process, you may prefer to work in Excel. After adding the information in Excel, close the file and reopen it in a text editor. **Make sure each address is on its own row, separated by a line return.** Scroll to the end of the file and delete any extra spaces after the last row of data.*

1. Open the “id_check” file.
2. The first row of the file defines the elements in the file. Each row contains one address. You may cut and paste the three IDs and address information from the sampling file. A value of “1” must be entered for the last element, “valid,” to ensure that the row is read by the program. The file is structured as shown in Table 1 below:

Table 1. Elements of the “id_check” file

Parts of the file	File contents
Elements of data file	id1,id2,id3,address1,address2,city,state,zip,valid
Row 1 of data	KKJWM,YFKPH,XKXJE,834 WASHINGTON ST,APT 1,TWISP,WA,98591,1
Row 2 of data	YSRET,QJDZF,YYJYI,210 Main St.,,Anytown,WA,98591,1
Row X of data	[additional rows of data]
Final row includes the SOS data	SOS,,,,,,,,,1

- Cut and paste **all** the unique IDs, addresses, and a “1” into either the Excel file or the text version of the “id_check” file. Use **all** of the IDs generated for the sampling frame (not just those for the sampled addresses) and **all** of the associated address information in the columns in the file. For the example data, the text file should look like the text in the box below:

id1,id2,id3,address1,address2,city,state,zip,valid
 KKJWM,YFKPH,XKXJE,834 WASHINGTON ST,APT 1,TWISP,WA,98591,1
 YSRET,QJDZF,YYJYI,210 Main St.,,Anytown,WA,98591,1
 SOS,,,,,,,,,1

NOTE: When there is no unit number or other address information, double commas must be included.

- Save and close the file.

5. Publishing the Survey

The final step in preparing the survey is to publish it.

- From inside Survey123 Connect, with the survey open: Click the “Publish” button on the side of the screen:



- Click “OK.” Publishing the survey from Survey123 Connect pushes the survey online.
- Navigate to the ArcGIS website. You can get there by clicking the “Online” button in Survey123 Connect:



- A drop-down menu will appear. Choose “Manage in Survey123 website.”

Pro-Tip

Developing the survey is an iterative process—you may need to start over a few times! Before you publish, review the XLS form. After publishing the survey, you cannot make additional changes. If you have any issues, you will need to revise and republish the survey. Please read this [explanation](#) from Esri for more details.

5. This will take you to the ArcGIS website for Survey123. You may need to login.

From the website, another **two** steps are necessary:

1. Create a “thank you” message. Go to the “**Design**” tab, then update the message. Click “**Publish**” when finished.

The message can contain anything you think is appropriate. It is also a good place to indicate that if a second family lives at the address, they can fill out a second survey with a unique ID.

2. **Publish** the survey a **second** time. This is required to allow the team to download the survey to their handheld devices and allow respondents to take the survey online.
 - a. Navigate to the “Collaborate” tab.
 - b. Change “Who can submit to this survey?” to “Everyone (Public)” and click Save.

Now that the survey is published, it can be taken via the website or downloaded to a handheld device, such as a phone or tablet, for in-person data collection.

6. Collecting Data With Survey123

Data can be collected through a mobile phone, handheld tablet, or web-based form. For in-person interviewing, data are collected with the app installed on a tablet.

Interviewers can collect data while offline. The data will then be uploaded when an internet connection is reestablished. The field team will also use the unique family IDs to populate each survey form with address information.

The letters sent to potential respondents inviting them to complete the survey contain a link to the Survey123 website along with the unique family IDs for that respondent. Respondents must use their unique ID to enter data.

7. Extracting Data From Survey123

To extract data from the survey, navigate to the “Data” tab of the Survey123 website:

1. You may go directly to the website.
2. Alternatively, from the Survey Connect program, click on the globe icon and choose “Manage in the Survey123 website.” This will take you directly to the survey results.
3. In the “Data” toolbar, click “Export.” We recommend exporting the data in an Excel format.
4. Before you add Survey123 data into the Excel analysis tool, you must “clean” the data. You can download the [Excel tool](#) from the Toolkit.
5. After the data are copied into the Excel analysis tool, they should not be edited.
6. **NOTE:** If you have problems downloading the data, see this link for a possible solution: <https://support.esri.com/en/technical-article/000023086>

7.1. Data Cleaning in Survey123

In the copy of the data you downloaded, perform the following checks:

1. Remove entries when “income_f” = 0.
 - “Income_f” is a check to see whether total income was provided or, if it was refused, whether an answer was provided to the over/under question about the income limit. If “income_f” equals 0, neither type of income information was provided.
2. Check for blanks in the variable “What is the combined total income of all family members living in this household before taxes?”
 - If the two variables “If you would prefer to not provide your exact income, please select ‘Refuse’ below” and “What is the combined total income of all family members living in this household before taxes?” are blank, then remove the entry from the income analysis file. These entries contain no income information.
3. Save a copy of the export file.

7.2. Analysis Using the Excel Tool

1. Open the Excel tool: [Survey123 Data Entry Tool](#).
2. Review the “Instructions” sheet of the tool.
3. Open the file with the saved Survey123 data and select the entire sheet by clicking any cell and pressing Ctrl + A. Copy the data to your clipboard by pressing Ctrl + C or pressing the Copy button in the Excel tools ribbon.
4. Paste the clean Survey123 data into the “Survey123 Input” sheet. Click the top-left cell of the sheet (“A1”), then paste the data from your clipboard using Ctrl + V or the Paste button in the Excel tools ribbon.
5. The formulas will run automatically.
6. Add the required information in the “Reference” tab.
7. Results will be generated in the “Report” tab, which you can print by clicking the print symbol (see below). The report will output as a PDF file.



7.3. Analysis in Survey123

If you decide not to use the Excel tool for the analysis, there is an alternative approach. In Survey123, there is an internal logic that flags a completed case as LMI based on the income reported in the survey, then creates a variable (“income_persons”) indicating the number of people in that family who are LMI. If you sum “income_persons” and divide it by the total number of people in **all** families, the result is the percentage of LMI people in the area.

The following variables are key to this analysis:

1. “family_size_c” is the number of family members residing at an address.
2. “income_persons” is the number of people in each LMI family.
3. “income_f” is an indicator of income data for that family.

To calculate the total LMI in the area, first remove all the rows where “income_f” = 0. Then divide the sum of “income_persons” by the sum of “family_size_c.” This will return the percentage of persons in LMI families.