COLORADO
Department of Education

Instructions for Using the Census Geocoder Tool to Identify Student Census Block Data

Data Pipeline Interchanges - At-Risk website
https://www.cde.state.co.us/datapipeline/inter_atrisk

For questions, contact us at ARMeasure@cde.state.co.us

Updated September 10, 2024

1525 Sherman Street, Suite 309, Denver, CO 80203; 303-866-6600; www.cde.state.co.us

Instructions for Using the Census Geocoder Tool

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Contents

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Introduction

In order to implement the new at-risk measure (as created in HB22-1202 and pursuant to SB24-188), districts must submit Census block data for each student as part of the district's Student October data submission. **The purpose of this document is to provide instructions for identifying each student's Census block data using the Census Geocoder tool**.

The Census Geocoder is a tool that allows users to submit a single address, batch of up to 10,000 addresses, or location coordinates in order to look up addresses. The Census Geocoder tool releases updated geography and address ranges at least once per year as they continually improve addresses and address ranges. For example, the geocoder will update address ranges in September 2024, potentially matching previously unmatched, new development addresses.

The following resources provide information about the use of the Census Geocoder tool:

- Census Geocoder Documentation
- Census Geocoder User Guide
- Census Geocoder Frequently Asked Questions (FAQ)

Once the Census block data is obtained, districts will provide the data to the Colorado Department of Education through the At-Risk Interchange file for each student included in its Student October Snapshot. This student-level data will then be used to calculate the district's Total Program funding as described in the school finance formula. These instructions are intended to help identify census block group information for all student addresses, with ongoing address updates if needed for future years.

*Note: If a district has its own GIS system that is capable of obtaining census data for individual student addresses, use of the Census Geocoder tool may not be needed.

Throughout this Guide, the Delta symbol Δ is used to identify information that has been updated or clarified since the previous edition of this document.

Instructions for Using the Census Geocoder Tool

Step 1: Collect Student Residential Address Data

In order to obtain census block data, districts must have **physical residential** addresses for each student included in its Student October Snapshot.

In most cases, districts already have residential address data for each student stored within their Student Information System (SIS). However, if physical residential addresses are missing for any of its students, the district should attempt to obtain this information from the parent/guardian.

Δ If the district is missing residential address data for students, it is possible that the district can find student residential addresses in the district's bus-routing system, such as Transfinder, Tyler Technologies, SMART Tag, Education Logistics (EduLog), BusRight, Seon, SafeFleet, etc.

Step 2: Prep Address Data for Use

Once the district has physical residential addresses, it should review the addresses for correct spellings, formatting, etc.

Below are some considerations when preparing your student address data for upload to the Census Geocoder tool:

- All addresses must be street addresses (e.g., address used for bus routing), not P.O. boxes.
- Districts should use a student's **primary** address in effect as of the pupil enrollment count date (October 1, 2024).
    - For districts that have two primary household addresses for students, use the student's primary physical household address.
- Note: Address information can be all capitalized, all lowercase, or properly capitalized.
- All addresses must include a zip code.
- Avoid misspellings when possible (e.g., 201 Calfax instead of 201 E. Colfax).
- Use the entire word "County" for County Road, as opposed to abbreviations (i.e., Cnty, Co)

Step 3: Create Excel Spreadsheet for Upload to the Census Geocoder Tool

Once a district has clean address data, it will need to create an Excel Spreadsheet that includes all student addresses that will be uploaded to the Census Geocode tool. If this information is stored within its student information system (SIS), it is likely the district will first export the address data out of that system.

Instructions for Using the Census Geocoder Tool

Δ If the SIS exports a CSV, save the CSV as either an .xls or .xlsx document. If the district has residential address data in the SIS but needs support in exporting the data, please reach out to your SIS provider. If the district uses Infinite Campus or PowerSchool, please see Appendix B for additional tips and resources.

The Excel spreadsheet that will be uploaded to the Census Geocoder tool should contain 2 data columns (see Option One) or 5 data columns (see Option Two), and should look like one of the following formats:

Option One

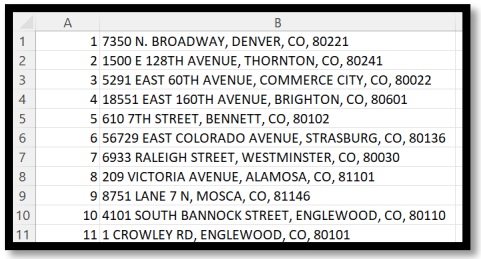
SASID	Address
999999999	201 E Colfax Ave, Denver, CO 80203

Option Two

SASID	Street	City	State	ZIP
999999999	201 E Colfax Ave	Denver	CO	80203

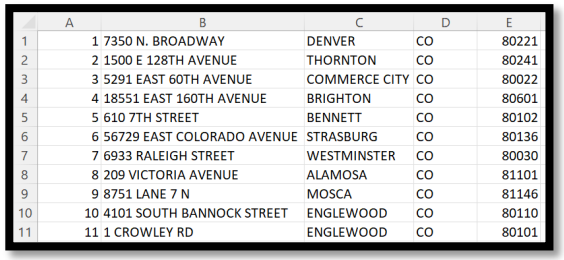
Modifying the Spreadsheet

Once the spreadsheet is created, the header row (row 1) will need to be deleted. The result will look something like this:



	A	B
1	1	7350 N. BROADWAY, DENVER, CO, 80221
2	2	1500 E 128TH AVENUE, THORNTON, CO, 80241
3	3	5291 EAST 60TH AVENUE, COMMERCE CITY, CO, 80022
4	4	18551 EAST 160TH AVENUE, BRIGHTON, CO, 80601
5	5	610 7TH STREET, BENNETT, CO, 80102
6	6	56729 EAST COLORADO AVENUE, STRASBURG, CO, 80136
7	7	6933 RALEIGH STREET, WESTMINSTER, CO, 80030
8	8	209 VICTORIA AVENUE, ALAMOSA, CO, 81101
9	9	8751 LANE 7 N, MOSCA, CO, 81146
10	10	4101 SOUTH BANNOCK STREET, ENGLEWOOD, CO, 80110
11	11	1 CROWLEY RD, ENGLEWOOD, CO, 80101

or



	A	B	C	D	E
1	1	7350 N. BROADWAY	DENVER	CO	80221
2	2	1500 E 128TH AVENUE	THORNTON	CO	80241
3	3	5291 EAST 60TH AVENUE	COMMERCE CITY	CO	80022
4	4	18551 EAST 160TH AVENUE	BRIGHTON	CO	80601
5	5	610 7TH STREET	BENNETT	CO	80102
6	6	56729 EAST COLORADO AVENUE	STRASBURG	CO	80136
7	7	6933 RALEIGH STREET	WESTMINSTER	CO	80030
8	8	209 VICTORIA AVENUE	ALAMOSA	CO	81101
9	9	8751 LANE 7 N	MOSCA	CO	81146
10	10	4101 SOUTH BANNOCK STREET	ENGLEWOOD	CO	80110
11	11	1 CROWLEY RD	ENGLEWOOD	CO	80101

Δ Check the columns for any blank cells and remove them. The geocoder tool will now work properly if cells are missing.

Instructions for Using the Census Geocoder Tool

Removing students that are part of a confidentiality program

If there are any students included in the spreadsheet that are part of a confidentiality program, remove their data rows, as these students' residential addresses will not be geocoded.

Guidance found in the At-Risk Interchange "File Layout" describes how to report census block data for students in a confidentiality program.

Saving Excel Spreadsheet(s)

The Census Geocoder tool can only process spreadsheets with less than 10,000 entries.

Districts with **fewer than 9,000 enrolled students:**

- Save the Excel spreadsheet.

Districts with **at least 9,000 enrolled students:**

- Create separate Excel spreadsheets for each set of 9,000 students.
    - For example, if a school district enrolls 26,000 students, that district will need a total of four Excel spreadsheets: three separately saved Excel spreadsheets of 9,000 students and an additional Excel spreadsheet of 1,000 students.
- Save Excel spreadsheets separately.

Step 4: Use the Census Geocoder Tool to Obtain Census Block Data

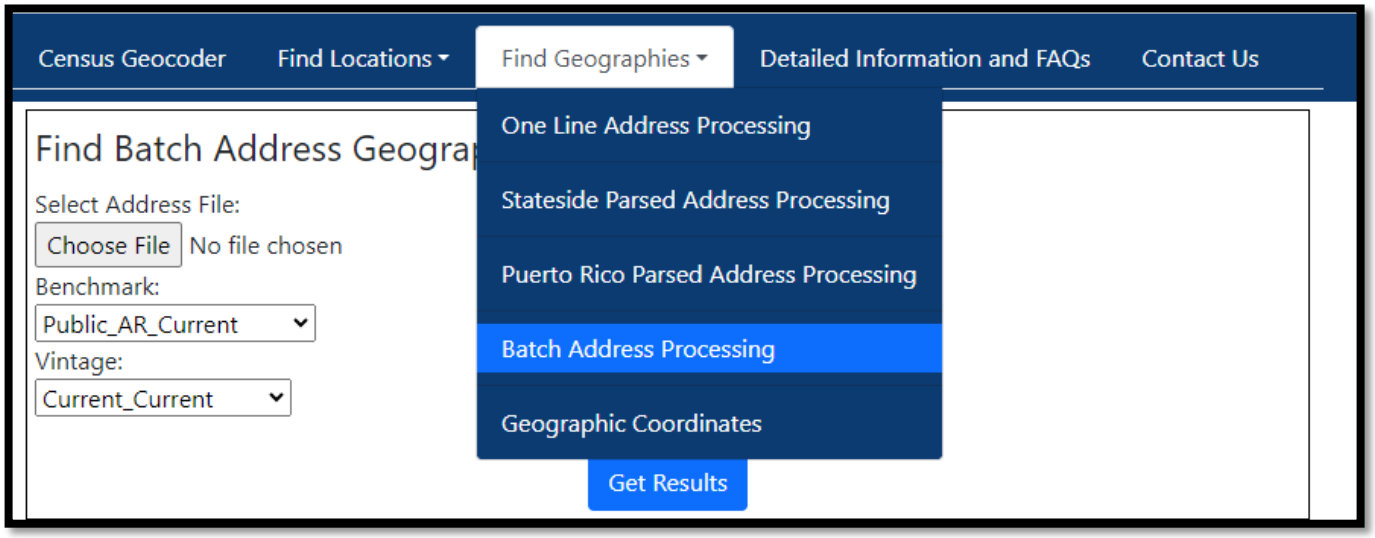
Districts will use the Census Geocoder tool to obtain the necessary census data (i.e., state code, county code, track code, and block code) required for the At-Risk Interchange file (https://www.cde.state.co.us/datapipeline/inter_atrisk).

Uploading Excel Spreadsheet using the "Batch Address Processing" Option

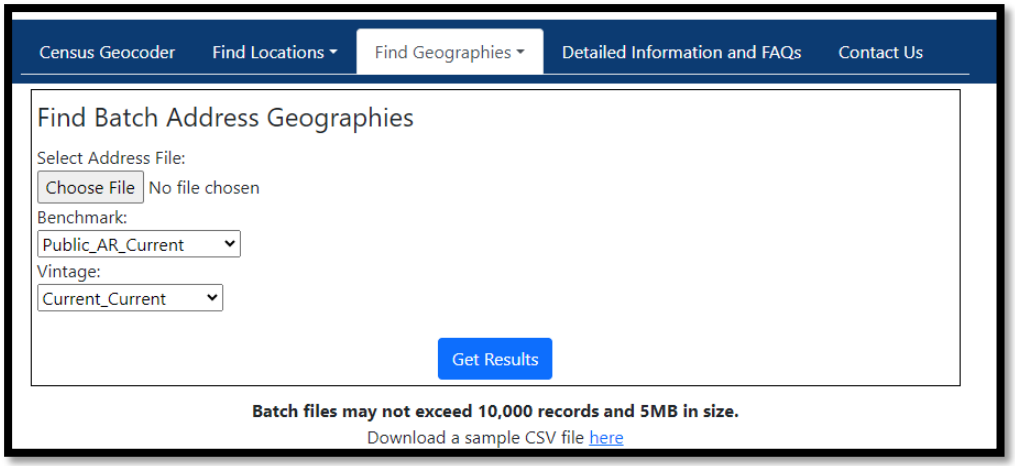
Using the Census Geocoder tool website

From the Census Geocoder tool main website (https://geocoding.geo.census.gov/geocoder/), click on the "Batch Address Processing" option found under the "Find Geographies" tab dropdown menu.

Instructions for Using the Census Geocoder Tool



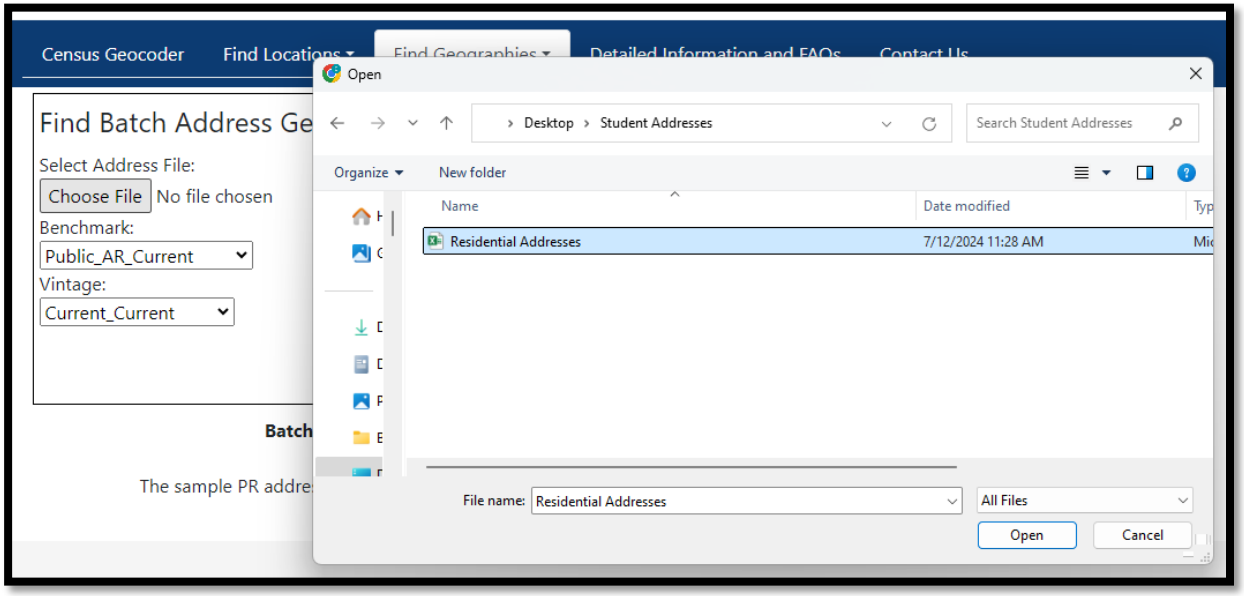
Once the "Batch Address Processing" option is selected, the following screen will appear.



Instructions for Using the Census Geocoder Tool

Uploading Excel Documents

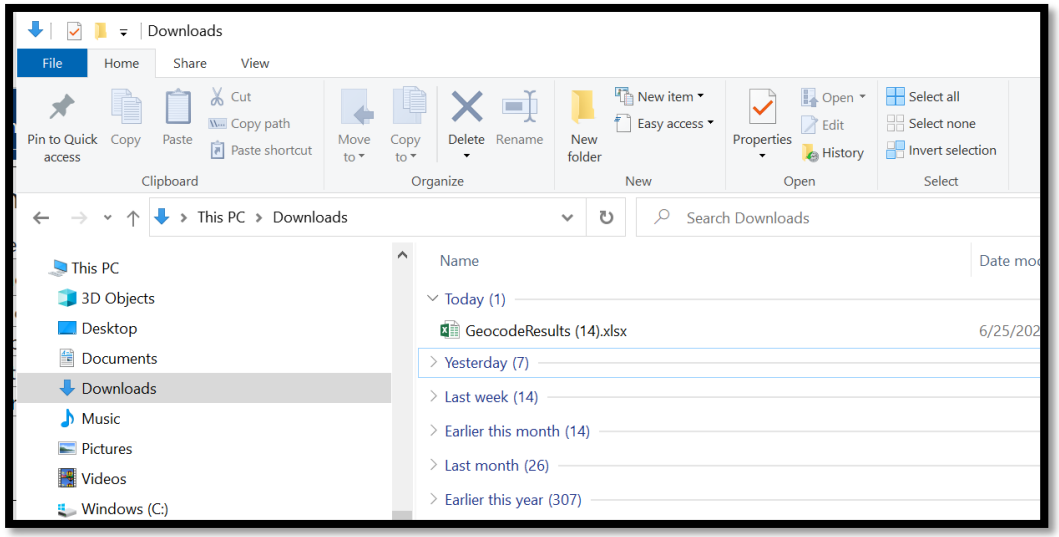
1) Under “Select Address File,” click “Choose File” to upload your first Excel document.
2) You will see a pop-up window.
3) Browse to the location of the saved Excel files.
4) Click Open.



Getting Results

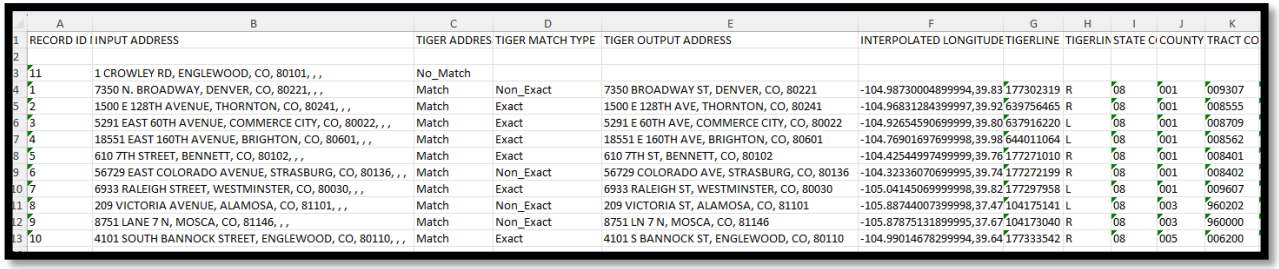
Once the correct Excel file is selected, click “Get Results.”

- For districts with **larger files**, it can take 30 minutes or more to process, depending on the computer and internet speeds.
- Results will be downloaded directly into your “Downloads” folder.



Instructions for Using the Census Geocoder Tool

Open the downloaded Excel file, “GeocodedResults,” to find something similar to the following:



	A	B	C	D	E	F	G	H	I	J	K
1	RECORD ID	INPUT ADDRESS	TIGER ADDRES	TIGER MATCH TYPE	TIGER OUTPUT ADDRESS	INTERPOLATED LONGITUDE	TIGERLINE	TIGERLIN	STATE C	COUNTY	TRACT CO
2											
3	11	1 CROWLEY RD, ENGLEWOOD, CO, 80101, , ,	No_Match								
4	1	7350 N. BROADWAY, DENVER, CO, 80221, , ,	Match	Non_Exact	7350 BROADWAY ST, DENVER, CO, 80221	-104.98730004899994,39.83	177302319	R	08	001	009307
5	2	1500 E 128TH AVENUE, THORNTON, CO, 80241, , ,	Match	Exact	1500 E 128TH AVE, THORNTON, CO, 80241	-104.96831284399997,39.92	639756465	R	08	001	008555
6	3	5291 EAST 60TH AVENUE, COMMERCE CITY, CO, 80022, , ,	Match	Exact	5291 E 60TH AVE, COMMERCE CITY, CO, 80022	-104.92654590699999,39.80	637916220	L	08	001	008709
7	4	18551 EAST 160TH AVENUE, BRIGHTON, CO, 80601, , ,	Match	Exact	18551 E 160TH AVE, BRIGHTON, CO, 80601	-104.76901697699998,39.98	644011064	L	08	001	008562
8	5	610 7TH STREET, BENNETT, CO, 80102, , ,	Match	Exact	610 7TH ST, BENNETT, CO, 80102	-104.42544997499999,39.76	177271010	R	08	001	008401
9	6	56729 EAST COLORADO AVENUE, STRASBURG, CO, 80136, , ,	Match	Non_Exact	56729 COLORADO AVE, STRASBURG, CO, 80136	-104.32336070699995,39.74	177272199	R	08	001	008402
10	7	6933 RALEIGH STREET, WESTMINSTER, CO, 80030, , ,	Match	Exact	6933 RALEIGH ST, WESTMINSTER, CO, 80030	-105.04145069999998,39.82	177297958	L	08	001	009607
11	8	209 VICTORIA AVENUE, ALAMOSA, CO, 81101, , ,	Match	Non_Exact	209 VICTORIA ST, ALAMOSA, CO, 81101	-105.88744007399998,37.47	104175141	L	08	003	960202
12	9	8751 LANE 7 N, MOSCA, CO, 81146, , ,	Match	Non_Exact	8751 LN 7 N, MOSCA, CO, 81146	-105.87875131899995,37.67	104173040	R	08	003	960000
13	10	4101 SOUTH BANNOCK STREET, ENGLEWOOD, CO, 80110, , ,	Match	Exact	4101 S BANNOCK ST, ENGLEWOOD, CO, 80110	-104.99014678299994,39.64	177333542	R	08	005	006200

Match Types and Sorting

Match Type Definitions

For each student and address included in a GeocodedResults spreadsheet, one of three “Match Types” will be identified in column C:

- **Match**: Student’s residential address is successfully matched to a Census-block.
  - Within “Matches,” column D describes if it was an “Exact” or “Non_Exact” match. Non-Exact matches may be due to discrepancies in unit numbers or zip codes. Both “Exact” or “Non_Exact” are acceptable.

- **Tie:** A tie occurs when there is a tie between two or more Census address ranges and indicates multiple possible results for that address.

- **No_Match**: In some instances, an address will fail to geocode. This often happens if:
  - Address is non-residential or commercial
  - Housing unit has been recently constructed and is not in the Census database yet
  - Local Addressing Authority changed the address, and changes are not yet reflected in the Census database
  - Address may be in a location where there is missing address range information
  - Housing unit may have been destroyed/demolished

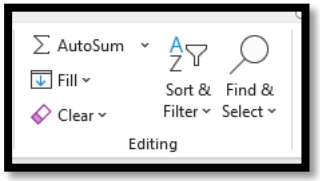
Sorting by Match Type

To better understand how many “Ties,” “No_Match,” and “Match” results there are, the list should be sorted by Match Type. To do this:

1. Highlight all of the results cells

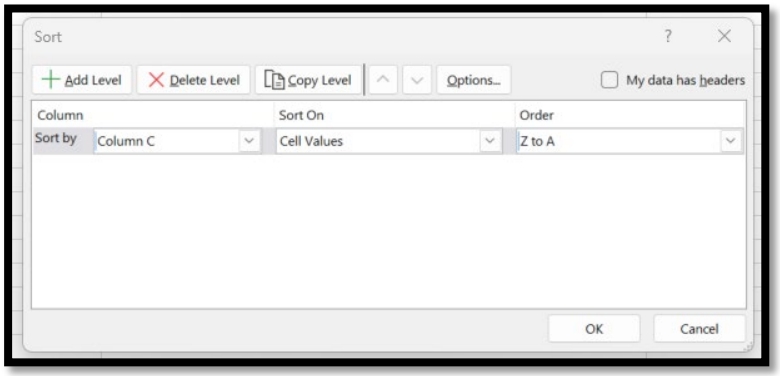
	A	B	C	D	E	F	G	H
1	RECORD ID	INPUT ADDRESS	TIGER ADDRES	TIGER MATCH TYPE	TIGER OUTPUT ADDRESS	INTERPOLATED LONGITUDE	TIGERLINE	TIGERI
2								
3	11	1 CROWLEY RD, ENGLEWOOD, CO, 80101, , ,	No_Match					
4	1	7350 N. BROADWAY, DENVER, CO, 80221, , ,	Match	Non_Exact	7350 BROADWAY ST, DENVER, CO, 80221	-104.98730004899994,39.8	177302319	R
5	2	1500 E 128TH AVENUE, THORNTON, CO, 80241, , ,	Match	Exact	1500 E 128TH AVE, THORNTON, CO, 80241	-104.96831284399997,39.9	639756465	R
6	3	5291 EAST 60TH AVENUE, COMMERCE CITY, CO, 80022, , ,	Match	Exact	5291 E 60TH AVE, COMMERCE CITY, CO, 80022	-104.92654590699999,39.8	637916220	L
7	4	18551 EAST 160TH AVENUE, BRIGHTON, CO, 80601, , ,	Match	Exact	18551 E 160TH AVE, BRIGHTON, CO, 80601	-104.76901697699998,39.9	644011064	L
8	5	610 7TH STREET, BENNETT, CO, 80102, , ,	Match	Exact	610 7TH ST, BENNETT, CO, 80102	-104.42544997499999,39.7	177271010	R
9	6	56729 EAST COLORADO AVENUE, STRASBURG, CO, 80136, , ,	Match	Non_Exact	56729 COLORADO AVE, STRASBURG, CO, 80136	-104.32336070699995,39.7	177272199	R
10	7	6933 RALEIGH STREET, WESTMINSTER, CO, 80030, , ,	Match	Exact	6933 RALEIGH ST, WESTMINSTER, CO, 80030	-105.04145069999998,39.8	177297958	L
11	8	209 VICTORIA AVENUE, ALAMOSA, CO, 81101, , ,	Match	Non_Exact	209 VICTORIA ST, ALAMOSA, CO, 81101	-105.88744007399998,37.4	104175141	L
12	9	8751 LANE 7 N, MOSCA, CO, 81146, , ,	Match	Non_Exact	8751 LN 7 N, MOSCA, CO, 81146	-105.87875131899995,37.6	104173040	R
13	10	4101 SOUTH BANNOCK STREET, ENGLEWOOD, CO, 80110, , ,	Match	Exact	4101 S BANNOCK ST, ENGLEWOOD, CO, 80110	-104.99014678299994,39.6	177333542	R
14								

2. Select “Custom Sort” from Excel’s “Sort & Filter” options



3. Sort the selection by “Column C” to order “Z to A”

Instructions for Using the Census Geocoder Tool



Once the results in the GeocodedResults spreadsheet have been sorted by Match Type, students with a Match Type of “Match” may be considered complete and ready to be included in the district’s At-Risk Interchange file. For students with a Match Type of “Tie” or “No_Match,” additional processing to determine the student’s Census block data will be necessary before including in the interchange file.

Note: If “Ties” or “No_Matches” are apartment buildings or trailer communities, try removing the unit numbers from the address and resubmit to the Geocoder tool to improve match rates.

Step 5: Manually Processing "Ties" and "No_Match" Students

Students with a Match Type of "Tie" or "No_Match" in the GeocodedResults spreadsheet must be processed manually (where possible).

If Latitude and Longitude coordinates are available for an individual address, this information can be used to determine the Census block data associated with that address (see "Individual Addresses with Latitude and Longitude Information" below).

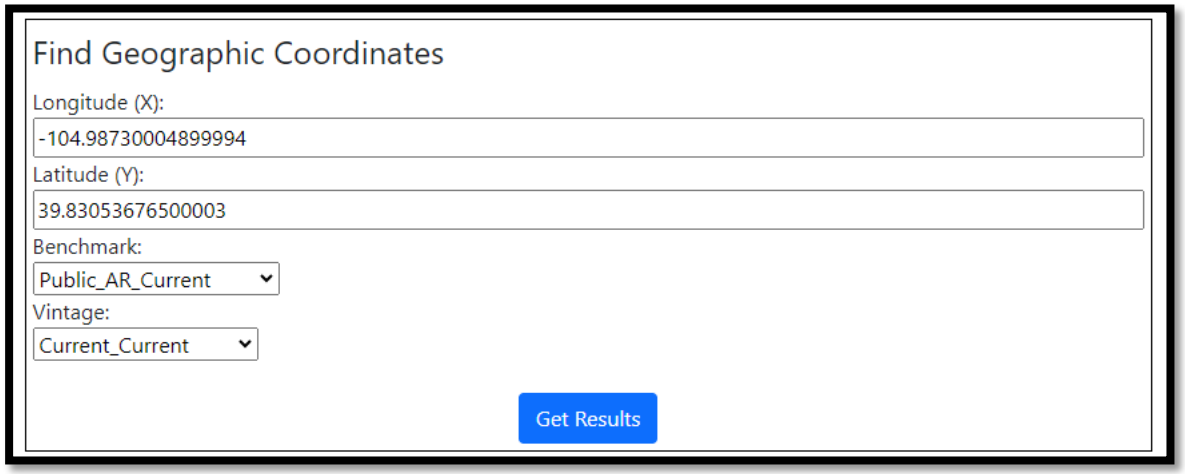
The Match Type for some addresses may be "Tie" or "No Match" because the address was not properly formatted or exact enough for the Census Geocoder tool. To "clean" these addresses, an external tool can be used to try to format the addresses before reuploading to the Census Geocoder tool (see "Batches of No-Match and Tie Addresses" below).

Individual Addresses with Latitude and Longitude Information

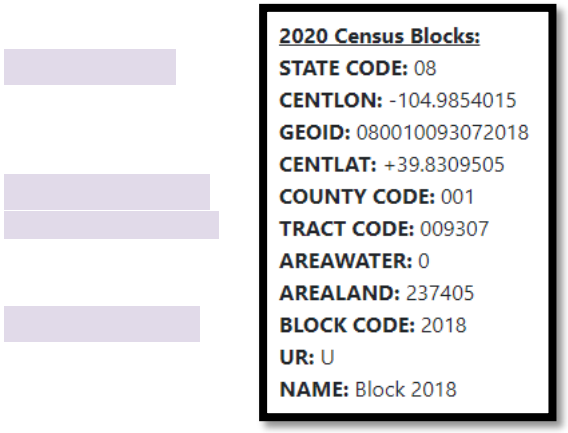
Some Student Information Systems (e.g., Infinite Campus) may include the latitude and longitude of a student's residential address. When this information is available, these coordinates can be used to identify a student's Census block data using the Census Geographic Coordinates option. (https://geocoding.geo.census.gov/geocoder/geographies/coordinates?form)

Entering the student's latitude and longitude.

Instructions for Using the Census Geocoder Tool



- Census block information can be found under “2020 Census Blocks”



Enter the information in the appropriate columns in the GeocodedResults document.

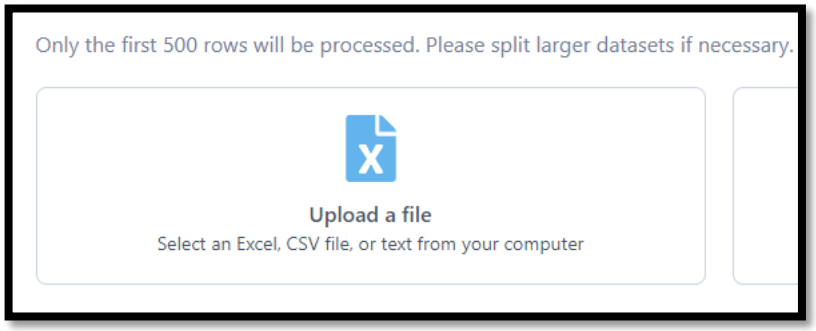
Batches of “No_Match” and/or “Tie” Addresses

In the event an address returns a Match Type of “No_Match” or “Tie” it is possible that the address is invalid or otherwise improperly formatted for the search. To verify the formatting of addresses (so that they can be processed using the Geocode website), the free Geoapify (https://www.geoapify.com/tools/address-validation/) tool can be used.

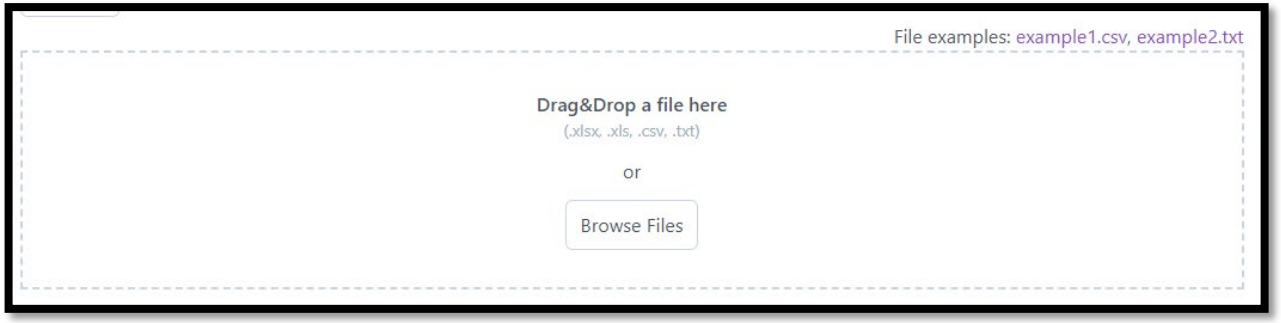
Save a separate Excel document with up to 500 “Tie” and/or “No_Match” addresses.

Click the “Upload a File” option.

Instructions for Using the Census Geocoder Tool



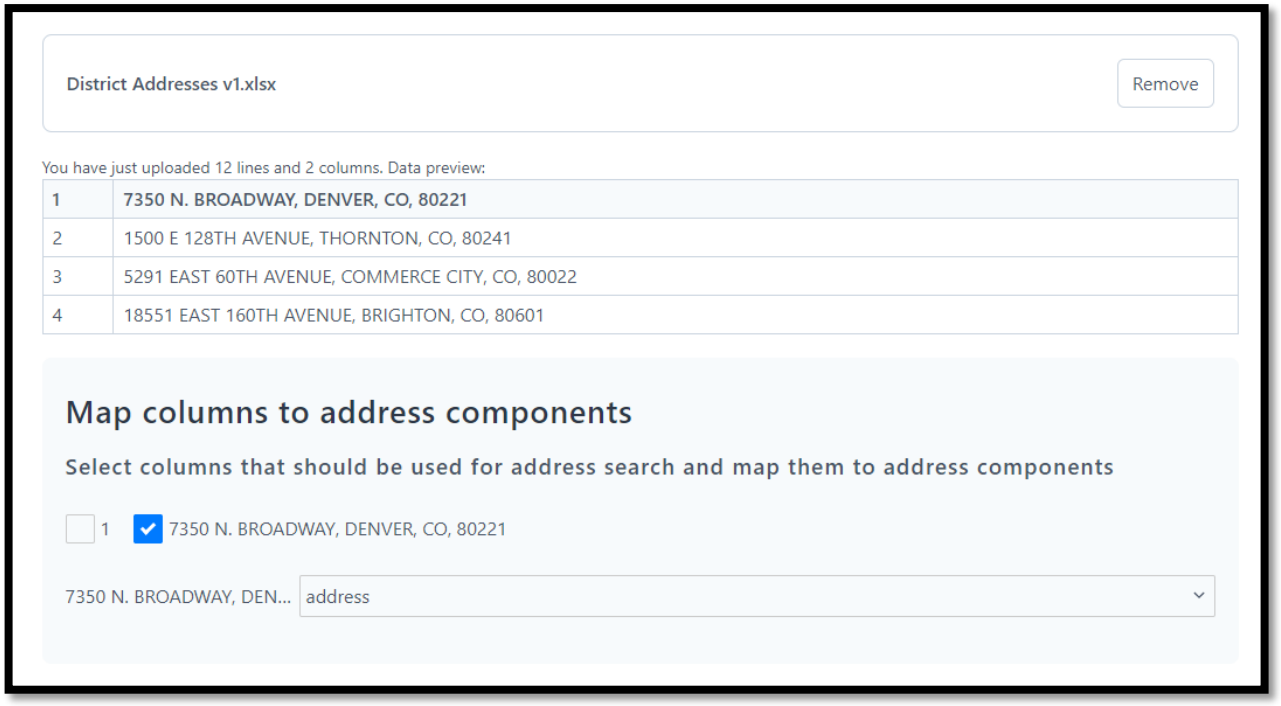
Drag and drop your Excel document or Browse in Geoapify's upload area.



Instructions for Using the Census Geocoder Tool

If submitting an Excel spreadsheet with 2 columns:

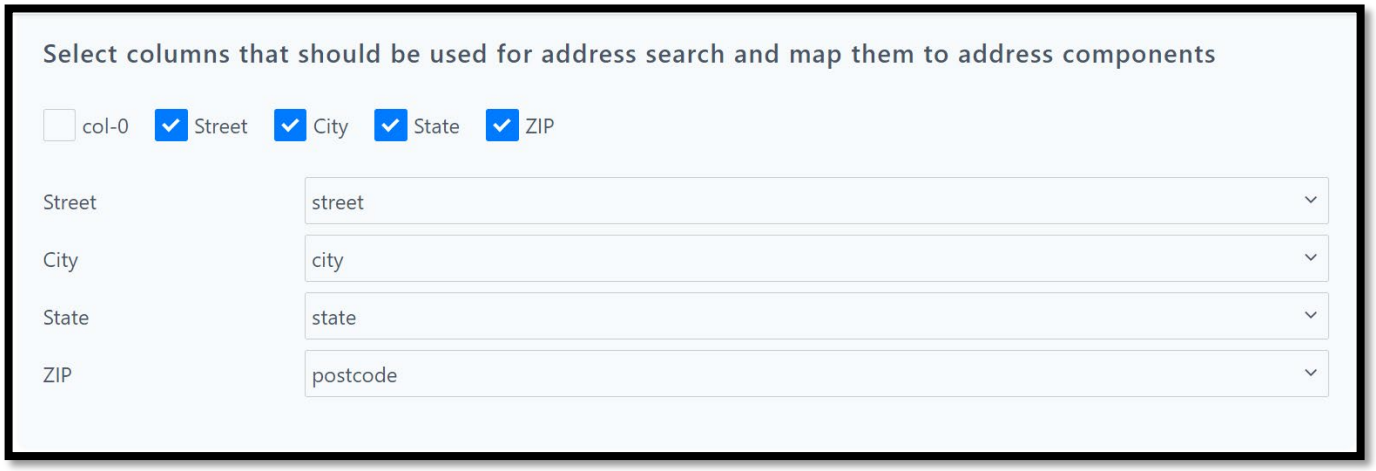
Check the box that corresponds to the address column, and select the dropdown that corresponds to the checked column.



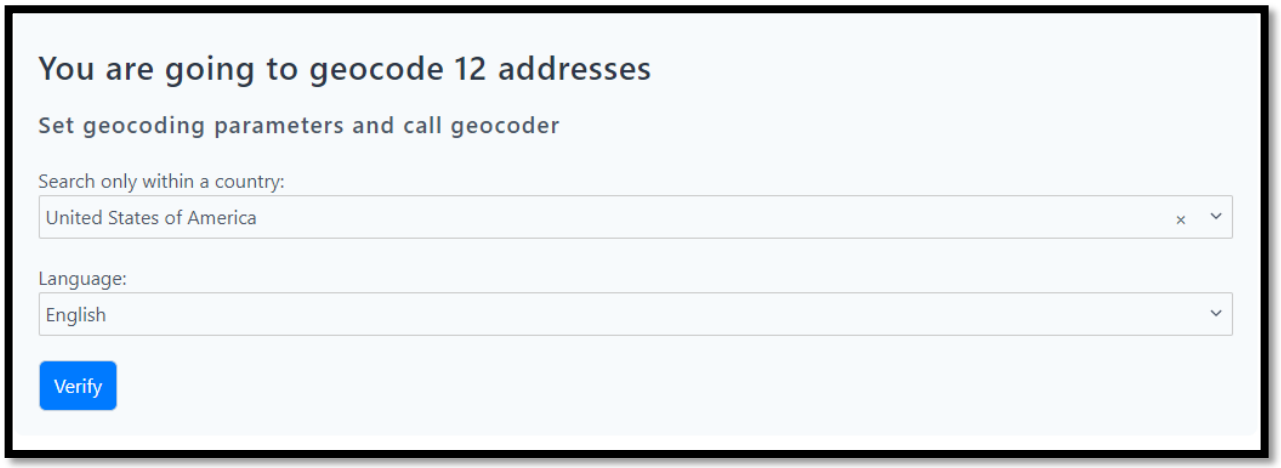
If submitting an Excel spreadsheet with 5 columns:

Check the box that corresponds to the address columns, and select the dropdown for each that corresponds to each column.

Instructions for Using the Census Geocoder Tool

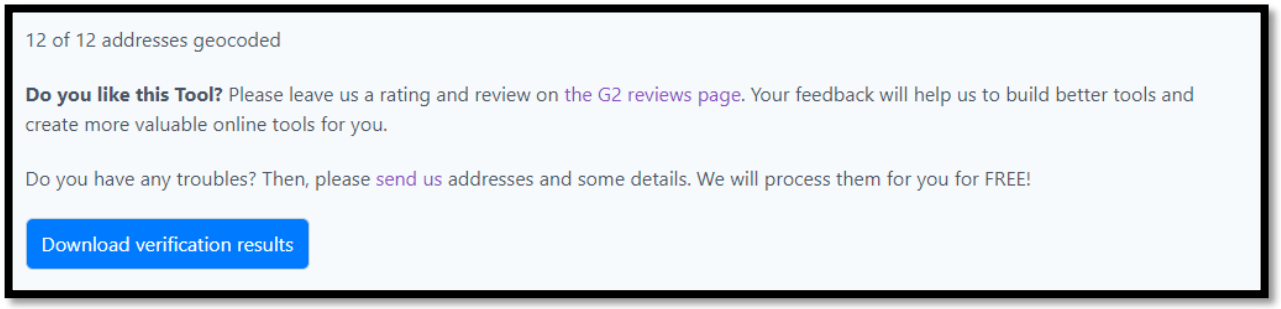


Select United States and English, then click Verify.

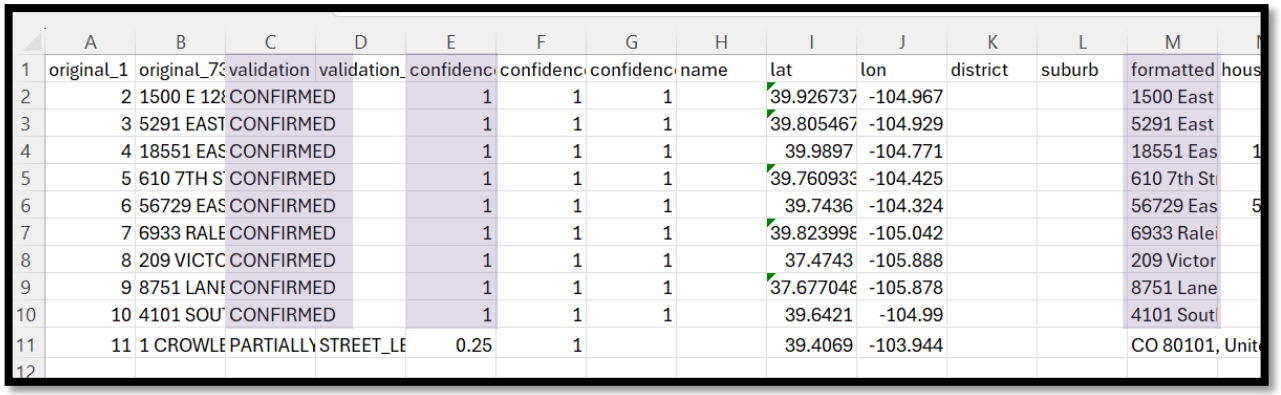


Click “Download verification results.”

Instructions for Using the Census Geocoder Tool



Go to the Downloads folder and open the generated report.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	original_1	original_73	validation	validation_	confidenc	confidenc	confidenc	name	lat	lon	district	suburb	formatted	hous
2	2	1500 E 12	CONFIRMED		1	1	1		39.926737	-104.967			1500 East	
3	3	5291 EAST	CONFIRMED		1	1	1		39.805467	-104.929			5291 East	
4	4	18551 EAS	CONFIRMED		1	1	1		39.9897	-104.771			18551 Eas	1
5	5	610 7TH S	CONFIRMED		1	1	1		39.760933	-104.425			610 7th St	
6	6	56729 EAS	CONFIRMED		1	1	1		39.7436	-104.324			56729 Eas	5
7	7	6933 RALE	CONFIRMED		1	1	1		39.823998	-105.042			6933 Ralei	
8	8	209 VICTC	CONFIRMED		1	1	1		37.4743	-105.888			209 Victor	
9	9	8751 LANE	CONFIRMED		1	1	1		37.677048	-105.878			8751 Lane	
10	10	4101 SOU	CONFIRMED		1	1	1		39.6421	-104.99			4101 Soutl	
11	11	1 CROWLE	PARTIALLY	STREET_LE	0.25	1			39.4069	-103.944			CO 80101, Unit	
12														

Δ The generated report will identify any validated address by showing “CONFIRMED” or “PARTIALLY CONFIRMED” in Column C **AND** a value of .9 or greater in Column E. These results will provide an alternate format in Column M that can be uploaded to the Census Geocode tool. To prepare the report for uploading to the Census Geocoder tool:

1) Delete rows for addresses that do not show as “CONFIRMED” or “PARTIALLTY CONFIRMED” in Column C **AND** a CONFIDENCE value of .9 or greater in Column E.
    - For addresses that were not able to be validated/formatted, refer to the “Missing Census Block Table” found on page 3 of the At-Risk Interchange File Layout.
2) Delete all columns except A (“original_1”) and M (formatted).
3) Delete first row/header row.

4) Save the Excel document.
5) Upload to Geocoder for additional matching information.
    - For remaining addresses that were not able to be validated/formatted, refer to the "Missing Census Block Table" found on page 3 of the At-Risk Interchange File Layout.

Step 6: Compile Complete List of Census Block Data

Once census block data is obtained for as many student addresses as possible following steps 1-5, the district will use this data to create the At-Risk Interchange file (https://www.cde.state.co.us/datapipeline/inter_atrisk) that will be uploaded through the Data Pipeline. When possible, districts are encouraged to store census block data for specific addresses for future use and reference.

For At-Risk Interchange reporting purposes, in the event a district is unable to obtain or verify census block data for a given address, districts should refer to the At-Risk Interchange File Layout located on the Interchange website for coding combination guidance on "Missing Census Block Data".

Instructions for Using the Census Geocoder Tool

Δ Appendix A: GIS System Information

Overview
This page is intended for districts who plan to use their own geographic information systems (GIS) to obtain state, county, tract, and block information using students' residential addresses.

Data Needed for the At-Risk Interchange File
Districts will need to obtain state, county, tract, and block code information associated with a student's primary physical residential address in their own GIS system. Some districts may have a few or all of these fields as part of their current systems. Refer to the At-Risk Interchange File Layout for more information.

Census Data Used in GIS Systems
Similar to districts that are using the Census Geocoder Tool, districts using their own GIS systems should use the most recent Census data available(2020 Decennial Census Geographies Data). Census geographies are only updated every 10 years, after each decennial census. Districts using their own GIS systems likely already maintain the necessary Census data, but in some cases, it may still be necessary to directly download the most recent Census data.

Note: The Census Geocoder Tool uses a current "Benchmark" and "Vintage." The Benchmark is the time period when the Census data snapshot was created (typically twice a year), and the Vintage is a set of data that each census or survey is linked to. Refer to the Census Geocoder User Guide for detailed information.

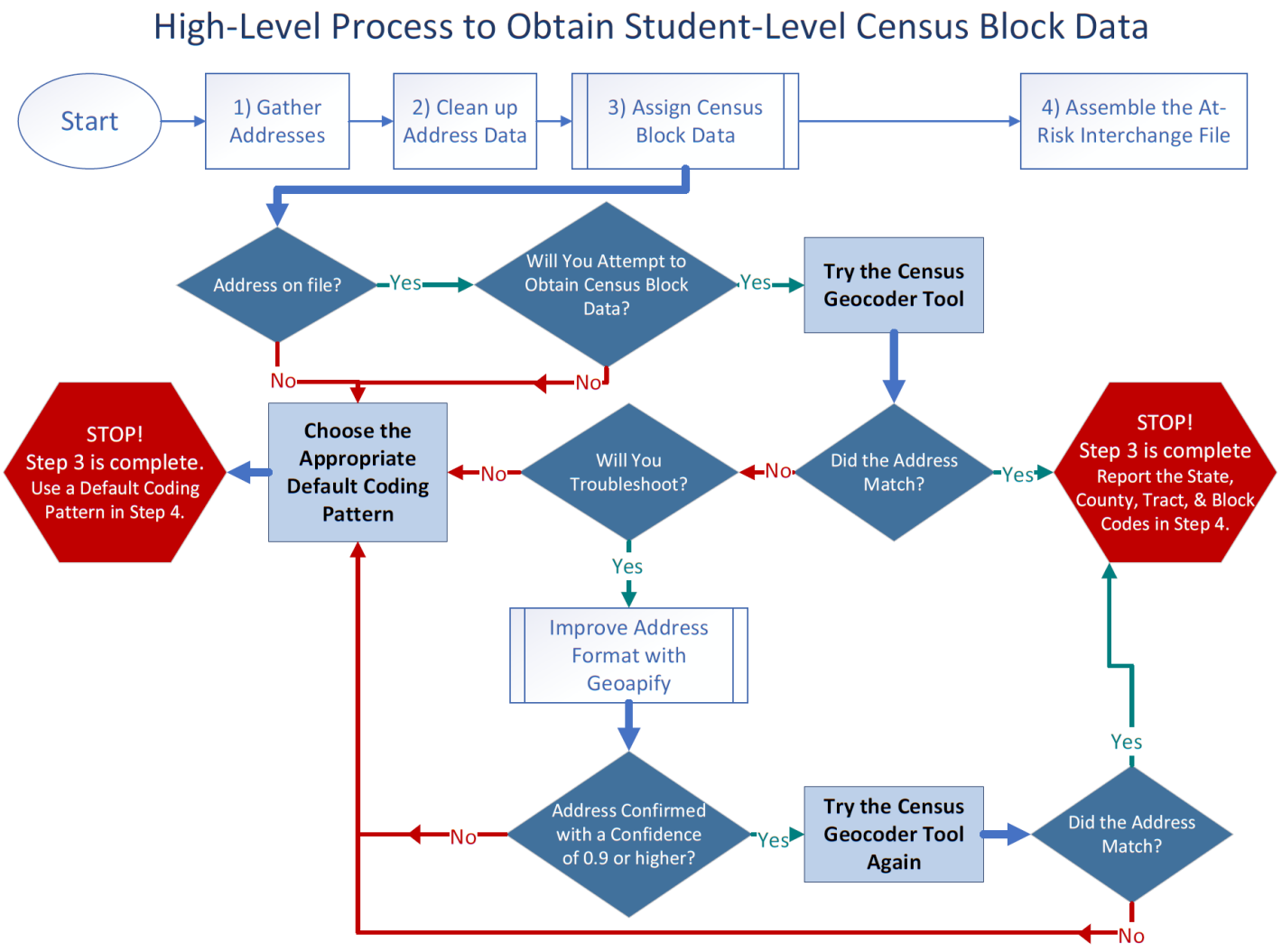
Δ Appendix B: Student Information System

Overview
This resource is intended to provide districts with an update (as of 9/10/2024) on how Infinite Campus and PowerSchool are addressing At-Risk Interchange File reporting requirements.

Infinite Campus:
As of this update, it is CDE's understanding that Infinite Campus is working individually with districts as they submit cases related to the At-Risk interchange reporting. They will provide guidance as needed to navigate their systems when geolocating students' physical addresses and obtaining census block group information. Districts will submit cases related to the At-Risk interchange reporting to their IC administrators and **are encouraged to reach out to their IC administrators for direct assistance.**

PowerSchool:
As of this update, it is CDE's understanding that PowerSchool will introduce a new Census Block Data section that will be added to the CO Demographics page. This will include a Confidentiality Program Participant checkbox and read-only fields for State Code, County Code, Tract Code, and Block Code (which will be populated later through a Geocode API). Additionally, a Foster Child checkbox will be added under the Student Demographics Information section. Users can start entering data for the Foster Child and Confidentiality Program Participant fields, while the Census Block Data fields will be updated in a future release. Districts are **encouraged to reach out to their PowerSchool administrators for information on future updates and other assistance.**

Δ Appendix C: High-Level Process Flow



Instructions for Using the Census Geocoder Tool

This is a text rendering of the flowchart above describing the high-level process to obtain student-level census block data. Step III is expanded to help districts determine when it is appropriate to choose a default coding pattern and when to report the state, county, tract and block codes.
At a high level, the process has four steps:

I. Gather addresses
II. Clean up address data
III. Assign Census Block Data
IV. Assemble the At-Risk Interchange File

To complete Step III:

1. Is there an address on file for the student?
   a. If yes, go to **2**
   b. If no, go to **8**
2. Will you attempt to obtain census block data?
   a. If yes, go to **3**
   b. If no, go to **8**
3. Try the Geocoder Tool. Did the address match?
   a. If yes, go to **7**
   b. If no, go to 4
4. Will you troubleshoot?
   a. If yes, go to **5**
   b. If not, go to **8**
5. Try to improve the address format with Geoapify. Was the address confirmed with a confidence of 0.9 or higher?
   a. If yes, go to **6**
   b. If not, go to **8**
6. Try the census geocoder tool again. Did the address match?
   a. If yes, go to **7**
   b. If not, go to **8**
7. **STOP! Step III is complete**. Report the state, county, tract, and block codes in Step IV.
8. **STOP! Step III is complete**. Choose the appropriate default coding pattern to report in Step IV.