COLORADO
Department of Education

August 27, 2025

Welcome to
Office Hours: Census Geocoder Deep Dive

Agenda

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  - Census Block Data
  - High Level Census Geocoder Tool Process
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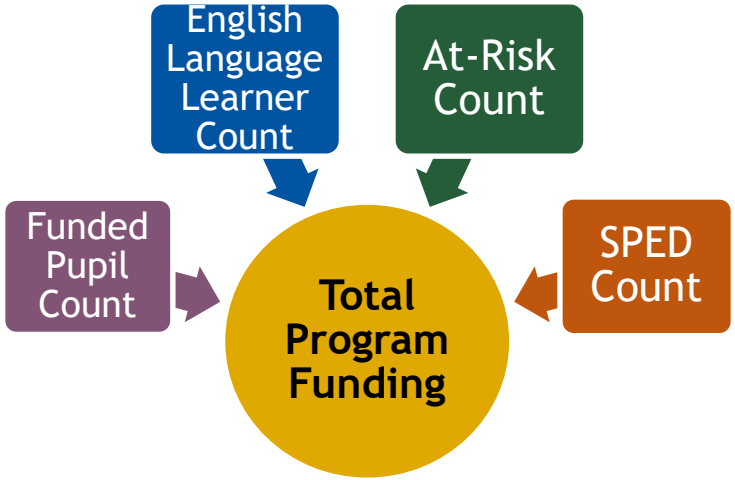
  - Step 2: Create Excel Spreadsheet for Batch Upload to Census Geocoder Tool
  - Step 3: Use the Census Geocoder Tool – Batch Processing
  - Step 4: Optional Address Validation
  - Step 5: Compile List of Census Block Data (At-Risk Interchange File)
- Tips/FAQ
  - Reasonable Expectations of Districts
- Resources

Introduction

At-Risk Count vs. At-Risk Interchange

- School districts in Colorado are funded by a variety of sources. The amount a district receives according to the School Finance Act is called Total Program Funding.
- Counts from the Student October Count data submission are used to calculate Total Program Funding through a funding formula.
- The At-Risk Count is part of the funding formula and includes data from the Student Demographic file.
    - Free/Reduced Lunch Eligible field (A.K.A. FRL eligibility or at-risk eligibility)
- **Data from the At-Risk Interchange is not currently included in the funding formula; however, the Interchange was created in anticipation for potential future inclusion.**



HB25-1320: School Finance Act
"Improved" At-Risk Measure

- Removes all references to the "new" At-Risk Measure.
- Mandates collection of student-level Census block data for the 25/26 SY.
    - Comply w/this mandate by geocoding and submitting the At-Risk Interchange file.
- Allows the State Board of Education to choose pausing/starting the collection of Census block data on a year-by-year basis.

Census Block Data:
4 Components

1. State Code
2. County Code
3. Tract Code
4. Block Code

Using all **4 components** gives each household a **specific, unique coding pattern:**

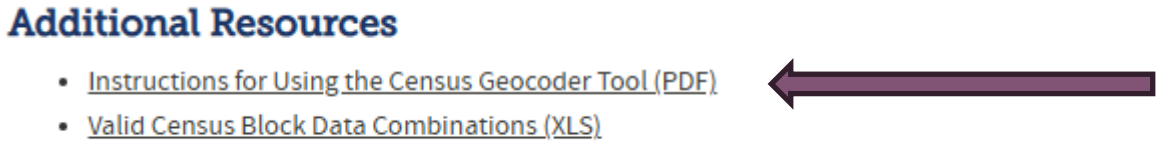
- Piecemealing components together most likely will result in an inaccurate Census block data
- It's possible to have many combinations with the same tract and block codes within the same county code

Geocoder Tool Process: High Level

1. Collect & Prep Student Residential Address Data
2. Create Excel Spreadsheet for Batch Upload to the Census Geocoder Tool
3. Use the Census Geocoder Tool – Batch Processing
4. Optional Address Validation
5. Compile List of Census Block Data (At-Risk Interchange File)

Instructions Document

All of the information from today's training can be found in the Instructions for Using the Census Geocoder Tool document located on the At-Risk Interchange website.



Census Geocoder Tool Step-by-Step

1. Collect & Prep Student Residential Address Data

- Districts must have physical residential addresses for each student included in their Student October Snapshots.
- Most districts already store physical residential address data w/in Student Information System (SIS) and will need to export the data out of their SIS.
- Tips/Common errors:
  - Use physical addresses – not P.O. Boxes.
  - Use a student's primary physical residential address as of October 1, 2025.
  - Addresses can be all capitalized, all lower case, or title case.
  - Include zip codes.
  - Avoid misspellings (i.e. 201 East Calfax instead of 201 East Colfax).
  - Avoid abbreviations.

Step 2: Create Excel Spreadsheet for Batch Upload to the Census Geocoder Tool

The spreadsheet you upload to the Census Geocoder Tool will have 2 columns or 5 columns as shown here:

Option 1: 2 Columns

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

Option 2: 5 Columns

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

2. Create Excel Spreadsheet for Batch Upload to the Census Geocoder Tool, cont.

Remove the header row (row 1).

2 Columns

	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

5 Columns

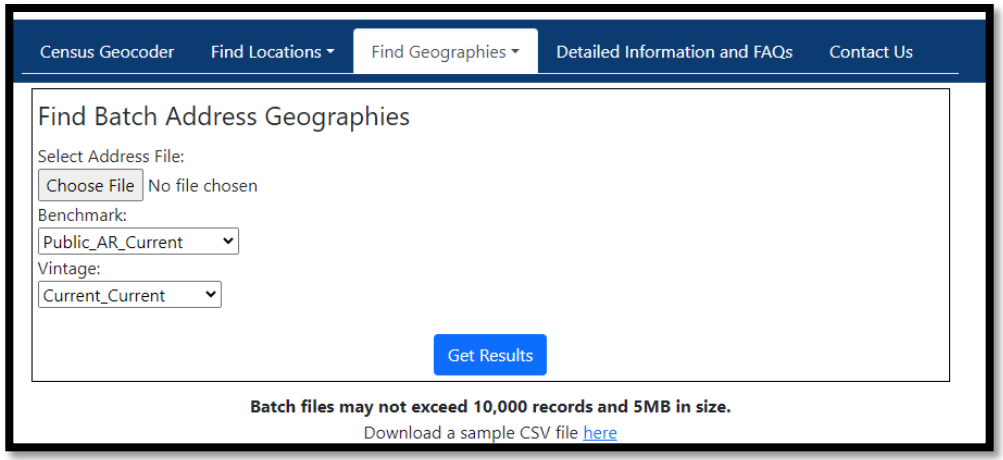
	A	B	C	D	E
1	1	7350 N. BROADWAY	DENVER	CO	80221
2	2	1500 E 128TH AVENUE	THORNTON	CO	80241
3	3	5291 EAST 60TH AVENUE	COMMERCE CITY	CO	80022
4	4	18551 EAST 160TH AVENUE	BRIGHTON	CO	80601
5	5	610 7TH STREET	BENNETT	CO	80102
6	6	56729 EAST COLORADO AVENUE	STRASBURG	CO	80136
7	7	6933 RALEIGH STREET	WESTMINSTER	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

2. Create Excel Spreadsheet for Batch Upload to the Census Geocoder Tool, cont. 2

- Remove any blank cells.
- Remove any rows containing information for students in confidentiality programs.
  - See the “Missing Census Block Data” section of the At-Risk Interchange File Layout for more info.
- Use more than one spreadsheet if your district has at least 9,000 enrolled students on 10/1.
  - Ex: For 20,000 students, create three Excel spreadsheets: two w/9,000 students and one w/2,000 students.
  - Save Excel spreadsheets separately. The Geocoder Tool cannot recognize workbook sheets/tabs.

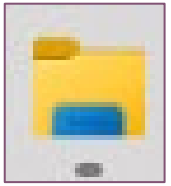
3. Use the Census Geocoder Tool – Batch Processing

- Navigate to the Census Geocoder Tool website.
- Click “Find Geographies.”
- Click “Batch Address Processing.”
  - Benchmark and Vintage fields will auto-populate.
- Upload the file from Steps 1 & 2
- Click “Get Results.”



3. Use the Census Geocoder Tool – Batch Processing, cont.

- Navigate to your “Downloads” folder in File Explorer.
- Find the Excel file named “GeocodedResults” and open it to see something similar to the screenshot below:



	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

3. Use the Census Geocoder Tool – Batch Processing, cont. 2

For each student, look at Column C ("Tiger Address Range Match Indicator"):

- "Match": Address has been successfully geocoded.
  - Column D ("Tiger Match Type") indicates "Exact" or "Non_Exact" (unit number/zip code); both are acceptable.
  - Use the "State Code," "County Code," "Tract Code," and "Block Code" fields in your At-Risk Interchange file.
- "Tie": A tie occurs when two/more Census address ranges indicate possible results for that address.
- "No_Match": An address has failed to geocode.

3. Use the Census Geocoder Tool – Batch Processing, cont. 3

No Matches usually occur because one/more of the following:

- 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 database isn't updated yet.
- Address range information is missing.
- Housing unit may have been destroyed/demolished.

For districts with "Tie" and "No_Match" results, districts can either:

- Refer to the "Missing Census Block Data" section of the At-Risk Interchange file layout to identify the most appropriate coding pattern for use in the Interchange file, or
- Proceed to optional Step 4 to try to troubleshoot and validate addresses.
- NOTE: County road addresses may not geocode. Check if the address is correct, then consider proceeding to Step 4 (longitude/latitude) or using a default coding pattern in your Interchange file.

Check Your Understanding 1

1. Which of the following geocode results should be investigated further?

A) Match

B) No_Match

C) Tie

D) All of the above

Step 4: Optional Data Validation

To better understand how many “Match,” “Tie,” and “No_Match” match types you have, sort the results based on Column C (“Tiger Address Range Match Indicator”):

1. Highlight the whole spreadsheet.
2. Select Column Sort, then Sort & Filter.
3. Sort the Selection by Column C to order “Z to A”.

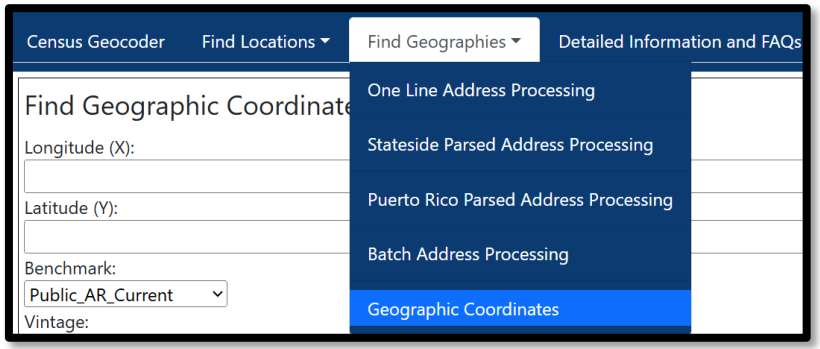
4. Optional Address Validation

For students with “Tie” or “No_Match,” a district should take additional steps to confirm student addresses are valid. These additional steps include:

- Googling an address to verify its validity and/or obtain longitude and latitude coordinates.
- Processing the longitude and latitude coordinates of an individual address through the Census Geocoder Tool.
  - This is the recommended option for a short list of addresses and addresses within new development communities.
  - Note: Longitude and latitude coordinates will always return a geocode; however, currently there is not an option to run a batch of coordinates through the Census Geocoder Tool.
- Using an external tool (e.g., Geoapify) to “clean” addresses and then re-upload them to the Census Geocoder Tool.
  - This is the recommended option for longer lists of addresses to validate.

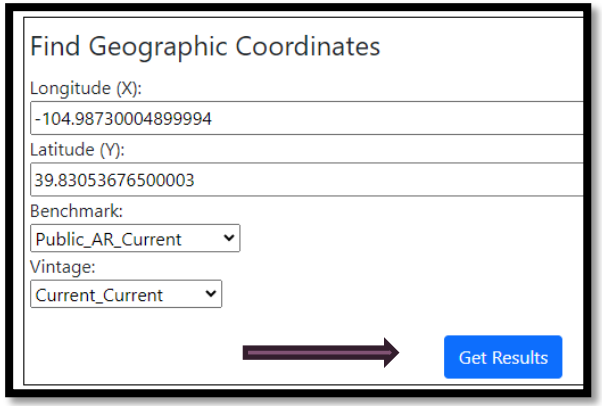
Step 4: Optional Address Validation
Longitude & Latitude Coordinates

- Navigate to the Census Geocoder Tool website.
- Click “Find Geographies.”
- Click “Geographic Coordinates.”



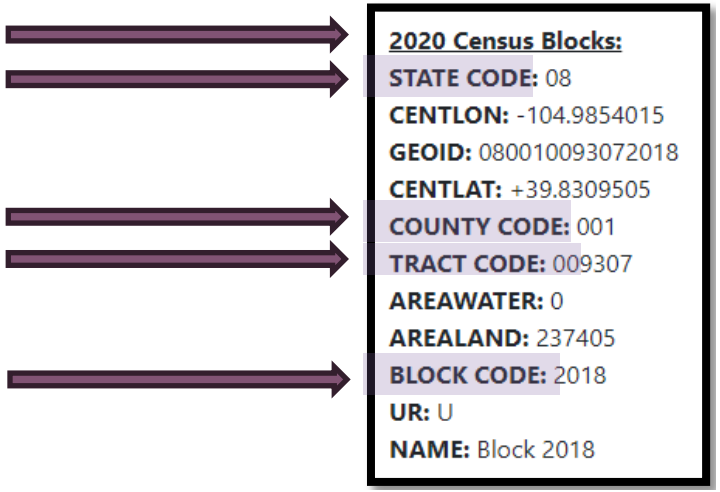
Step 4: Optional Address Validation
Longitude & Latitude Coordinates, cont.

- Input longitude and latitude.
  - Retrieve coordinates using Google Maps by right clicking on the target icon.
- Click “Get Results.”



Step 4: Optional Address Validation
Longitude & Latitude Coordinates, cont. 2

- Navigate to Census Block data under “2020 Census Results.”
- Use the 4 components of Census block data in your Interchange file.



Check Your Understanding 2

1. For a **short** list of addresses to validate, which strategy would you use?

A) A validation tool like Geoapify

B) Geocoding based on longitude and latitude coordinates

C) What are you talking about?

2. For a **long** list of addresses to validate, which strategy would you use?

A) A validation tool like Geoapify

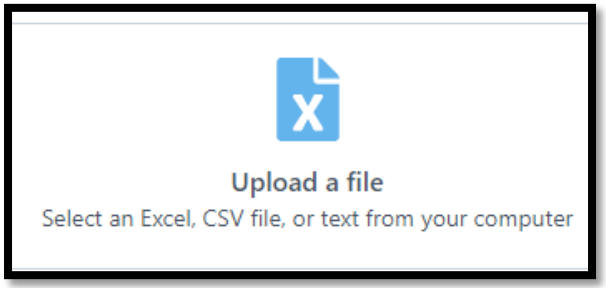
B) Geocoding based on longitude and latitude would you use?

C) What are you talking about?

Step 4: Optional Address Validation
Geoapify Batches of Addresses

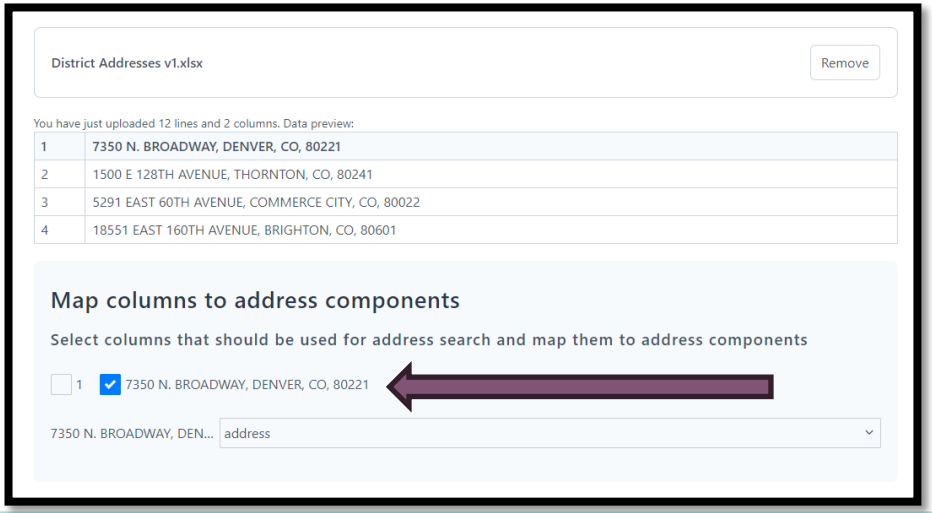
Invalid or improperly formatted addresses will return “Tie” and/or “No_Match” results from the Census Geocoder Tool. To verify the formatting of addresses, use the free Geoapify tool.

- Save a separate Excel spreadsheet with up to 500 “Tie” and/or “No_Match” addresses using the formatting from Step 1.
- Navigate to the Geoapify website and click “Upload a file.” Drag and drop your Excel spreadsheet OR “Browse” to find the file using File Explorer.



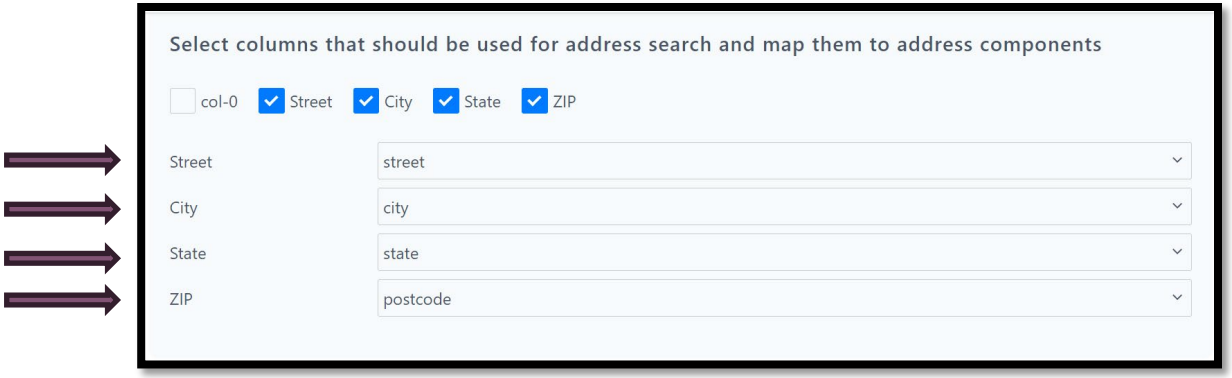
Step 4: Optional Address Validation
Geoapify Batches of Addresses, cont.

If your spreadsheet has 2 columns, select the dropdown that corresponds to the checked column.



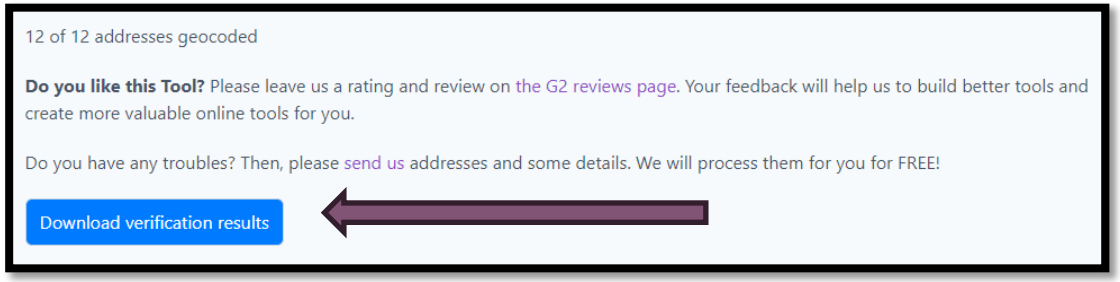
Step 4: Optional Address Validation
Geoapify Batches of Addresses, cont. 2

If your spreadsheet has 5 columns, check the boxes that correspond with columns on your spreadsheet, and select the dropdown that corresponds to each column.



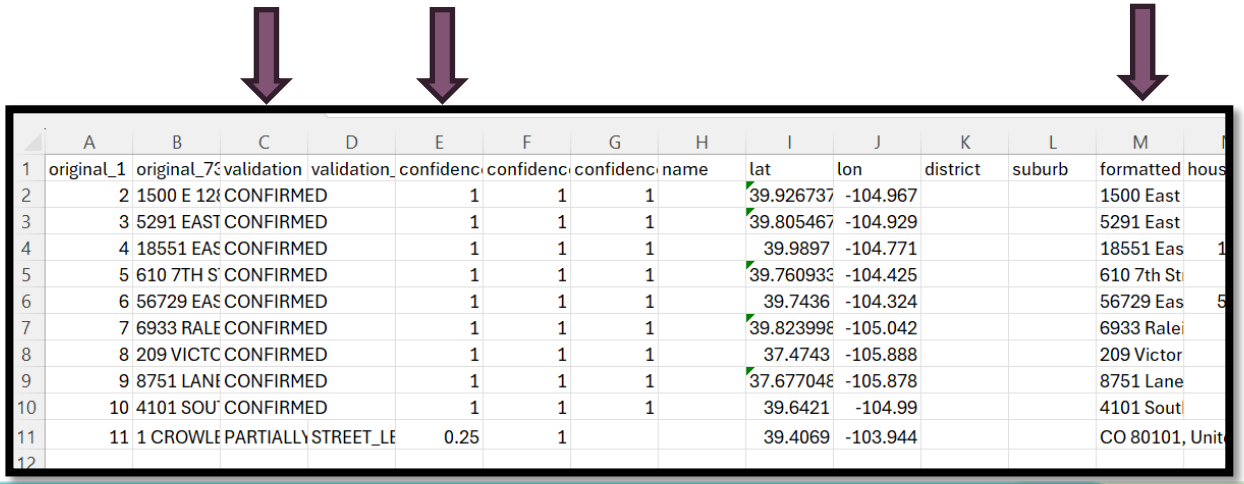
Step 4: Optional Address Validation
Geoapify Batches of Addresses, cont. 3

- Next, select “United States” and “English.” Then click “Verify.”
- Click the “Download verification results” button. The results will download directly into your “Downloads” folder in File Explorer as an Excel file.



Step 4: Optional Address Validation
Geoapify Batches of Addresses, cont. 4

The generated report will identify any validated address by showing "CONFIRMED" or "PARTIALLY CONFIRMED" in Column C AND a value of 0.9 or greater in Column E. These results provide an alternate format in Column M that can be uploaded to the Census Geocode tool.



	A	B	C	D	E	F	G	H	I	J	K	L	M	
1	original_1	original_7	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 LANI	CONFIRMED		1	1	1		37.677048	-105.878			8751 Lane	
10	10	4101 SOU	CONFIRMED		1	1	1		39.6421	-104.99			4101 Sout	
11	11	1 CROWLE	PARTIALLY	STREET_LE	0.25	1			39.4069	-103.944			CO 80101, Unit	
12														

Step 4: Optional Address Validation
Geoapify Batches of Addresses, cont. 5

To prepare the report for uploading to the Census Geocoder Tool:

- 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.
- Delete all columns except A (“original_1”) and M (formatted).
- Delete first row/header row.
- Save the Excel document.
- Upload to the Census Geocoder Tool.
- Add additionally matched geocodes to your At-Risk Interchange file.

Default Coding Patterns

Districts unable to get Census block data may use one of the following coding patterns (see pages 3 and 4 of the At-Risk Interchange File Layout):

Description	State Code	County Code	Track Code	Block Code
Address on File- Did Not Attempt to Obtain Census Block Data: The district has a primary physical address on file but did NOT attempt to obtain census block data using the geocode tool.	08	000	000001	0001
Address on File- No Census Block Data Returned: The district confirmed that the primary physical address is valid using USPS but the geocode tool did not return census block data.	08	000	000002	0002
Confidentiality Program: No census block data was provided because the district has confirmed the student is participating in a confidentiality program.	08	000	000003	0003
No Physical Primary Address on File- Identified Group: The district does not have a **valid** primary physical address on file and the student is confirmed homeless, migrant, foster child, or attending a detention center	08	000	000004	0004
No Physical Primary Address on File- No Identified Group: The district does not have a **valid** primary physical address on file and the student is not confirmed homeless, migrant, foster child, or attending a detention center.	08	000	000005	0005
Out of State codes: The district has a primary physical address on file that is not in Colorado	08	000	000006	0006

5. Compile List of Census Block Data (At-Risk Interchange File)

- After the district obtains Census block data for all students' physical primary addresses, the district then uses this data to create the At-Risk Interchange file which will be uploaded through Data Pipeline.
- For more information, review the Overview of the At-Risk Interchange File training slide deck.
- When possible, districts are encouraged to store Census block data for specific addresses for future use.

Tips/FAQ

Reasonable Expectations of Districts

1. Obtain “clean” household addresses
2. Geocode “clean” household addresses
3. Correct errors based on Match Type
4. Geocode again
5. Use coding patterns
6. Create the At-Risk Interchange file

Tips/FAQ

- The address data in the Census Geocoder Tool is updated annually. New home addresses may not match.
- County road addresses may not geocode using the batch method. Use the longitude/latitude method described in Step 4 of the Census Geocoder Instructions.
- Can't I just use a County codes list and address information from my SIS to piecemeal a geocode together?
    - No. Because each geocode is specific and unique to each address, you must use a geocoding tool to obtain the 4-component Census block information. Piecemealing increases the likelihood of inaccurate reporting.

Tips/FAQ, cont.

- I have tons of “No Matches.” What should I do?
  - Validate addresses and try again
  - Last resort: Use the default coding pattern
- This is a lot of work. Why should I do this again?
  - In addition to being mandated, collecting Census block data may potentially inform statewide funding formula factors in the future.
- I’ve successfully geocoded. Now what?
  - Create the At-Risk Interchange file. Instructions are linked here and training is on 8/21/25 at 10am.

Resources

Resources: CDE & Others

CDE Resources

- Training
  - At-Risk Interchange webpage
    - **Overview of Data Pipeline At-Risk Interchange File**
    - **Office Hours: Tools to Validate Addresses for Census Block Data Collection** 9/09 at 1pm
    - **Office Hours: Questions from the Field: Live Q & A** 10/09 at 1pm
  - School Auditing Office Training webpage
- Census Geocoder Instructions
- School Auditing Office At-Risk Count webpage
- Contact: ARMeasure@cde.state.co.us

Other Resources

- Census Geocoder User Guide, FAQ, etc.
- Geoapify

Questions?