

## Using Multifamily Housing Geocoded Data

There are two basic methods of mapping HUD Multifamily geocoded data: creating points from the latitude and longitude fields or aggregating the data to a Census statistical unit of geography, such as a Census tract.

### Mapping Latitude and Longitude Coordinates

The latitude and longitude fields in the geocoding output can be used to generate a point layer in most GIS desktop software. Before doing this, you must first consider the precision of geocode. Just because an address was assigned latitude and longitude coordinates, doesn't necessarily mean that it's fit to map. In the HUD's geocoding process, a Census 2000 LAT/LONG Geocoding Level Return Code is included in the results to help you determine how the coordinates were derived. This column is called LVL2K and these are the codes you will find in that column:

- R - Interpolated Rooftop (Household)
- 4 - ZIP+4 Centroid
- B - Block Group Centroid
- T - Census Tract Centroid Code
- 2 - ZIP+2 Centroid
- 5 - ZIP5 Centroid
- Z - ZIP5 Centroid (Same as 5 above)
- Null – Address did not code

For the purposes of showing the location of an address on a map or performing any point-in-polygon analysis, HUD recommends that you only use addresses where the LVL2K is coded 'R' or '4'. This will ensure that the address in question is at least displayed on the correct block. The remaining LVL2K codes will have latitude and longitude coordinates that may differ significantly, ranging from several hundred feet to several miles, from the actual location of the address. About 90% of the geocoded Multifamily properties meet this criteria.

### Aggregating Data using Census Geographic Codes

Specific geographic codes in the geocoding output have been combined to create unique geographic identifiers that will allow you to aggregate your geocoded data to the desired geographic level and then map them using various Census administrative boundary layers. The most commonly used Census geographies and the appropriate GSC output fields required for aggregating and mapping to these geographies are:

Mapping to Census Geographies		
Geography	GSC Output Field	Code Description
State	STATE2K	Census 2000 FIPS State Code (2-digit numeric with leading zeros significant)
County	COUNTY_LEV	Census 2000 FIPS State Code (2-digit numeric with leading zeros significant) & Census 2000 FIPS County Code (3-digit numeric with leading zeros significant)
Place	PLACE_LEVE	Census 2000 FIPS State Code (2-digit numeric with leading zeros significant) & FIPS Place Code (last updated May 2001)
Tract	TRACT_LEVE	Census 2000 FIPS State Code (2-digit numeric with leading zeros significant) & Census 2000 FIPS County Code (3-digit numeric with leading zeros significant) & Census 2000 Tract (contains leader zeros with the decimal point implied)

Mapping to Census Geographies		
Block Group	BLKGRP_LEV	Census 2000 FIPS State Code (2-digit numeric with leading zeros significant) & Census 2000 FIPS County Code (3-digit numeric with leading zeros significant) & Census 2000 Tract (contains leader zeros with the decimal point implied) & Census 2000 Block Group
**Metro Area (GDT_C00_HUD_CBSA & GDT_C00_HUD_CBDADIV)	CBSA	Contains the first of: Metropolitan Division; Micropolitan Area; Metropolitan Area; in this order

\*\* The statistical entity that used to be called the Metropolitan Statistical Area (MSA) has been revamped by the Office of Management and Budget and is now referred to as the Core Based Statistical Area.

The GSC returns a Census 2000 General Return code for each address that it attempts to geocode. This code can be used to determine the reliability of the Census geographic codes returned in the geocode process. These are the codes found in the RC2K column.

- S – Street Address Match
- 9 – 9-digit ZIP Match
- 5 – 5-digit ZIP Match
- Null – Address did not code

For aggregating data to the county, place, census tract or census block group level, only use records that have been coded 'S' or '9'. The geographic codes that are reported for a '5' match are not always reliable due to the fact that 5-digit ZIP codes rarely conform to Census administrative boundaries. However, if you are aggregating data to the metro or state level, there is no need to filter out any records based on the RC2K field. Even a 5-digit ZIP match is precise enough to determine the correct geographic code for these levels.