2012-2016 ACS Migration Flow Files Documentation

Introduction:

The U.S. Census Bureau has been releasing county-to-county and county/minor civil division (MCD)-to-county/MCD migration flow estimates based on the American Community Survey (ACS) since 2012. [1] The first table package used 5-year ACS data collected from 2005 through 2009, the first ACS 5-year period.[2] For sequential 5-year ACS datasets, tables were crossed by selected characteristics for the period of 2006-2010 to 2011-2015 datasets. The 2008-2012 release was the first time flows from Puerto Rico municipios to U.S. counties were included. Flows between metropolitan statistical areas (MSAs) were introduced with the 2009-2013 dataset.[3] In addition, the county-to-county flows going back to 2006-2010 dataset are available through the Census Flows Mapper.[4] As of 2016, all ACS migration flows data for counties, MCDs, and MSAs were made available in the Census application programming interface (API) through the Census Developers site.[5] This year's migration flows table package (based on 5-year 2012-2016 ACS) will deviate from previous years in that it will not include socio-economic characteristics, only basic flow counts.

Collection Years	Geographic Summary Levels	Characteristics
2005-2009	County, MCD*	None
2006-2010	County, MCD*	Age, sex, race, or Hispanic origin
2007-2011	County, MCD*	Educational attainment, household income, or individual income
2008-2012	County, MCD*	Employment status, work status, or occupation
2009-2013	MSA, county, MCD*	Ability to speak English, place of birth, or years in the United States (or Puerto Rico)
2010-2014	MSA, county, MCD*	Relationship to householder, household type, or housing tenure
2011-2015	MSA, county, MCD*	Age, sex, race, or Hispanic origin
2012-2016	**MSA, county, MCD***	**None**

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[1] For additional background information about historical migration flows, see <http://www.census.gov/library/working-papers/2012/demo/benetsky-02.html>. For information about the various characteristics, see <http://www2.census.gov/programs-surveys/acs/tech_docs/subject_definitions/2015_ACSSubjectDefinitions.pdf>.

[2] The ACS program combines consecutive yearly datasets to increase the sample size and provide reliable estimates for smaller areas. Even though estimates are produced for 1-year datasets, they are limited to geographic areas of at least 65,000 population. Only the 5-year datasets provide estimates for all counties and county equivalents in the United States.

[3] The MSA delineations are from February 2013. See <https://www.census.gov/population/metro/> for more information.

[4] The Census Flows Mapper <http://flowsmapper.geo.census.gov/> is an interactive, online mapping application.

[5] The Census Developers site is located at <http://www.census.gov/developers/>.

*Data at the MCD level are only available for the strong-MCD states of Connecticut, Maine, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and Wisconsin.

The 2012-2016 Release:

Unlike previous releases, the current migration flow release includes only basic counts and no characteristics.

Disclosure Avoidance:

Due to the amount of data released through standard 5-year ACS data products as well as the public use microdata samples (PUMS), and because sequential annual 5-year estimates contain overlapping samples; the Census Bureau must be vigilant in order to protect confidentiality of the respondents. Any data products that the Census Bureau releases must be reviewed and approved by the Disclosure Review Board based on disclosure avoidance rules to assure confidentiality of the respondents is protected according to Section 9 of Title 13 of the United States Code. It states "Neither the Secretary, nor any other officer or employee of the Department of Commerce or bureau or agency thereof, or local government census liaison may…make any publication whereby the data furnished by any particular establishment or individual under this title can be identified…"[6]

Record swapping, done to protect confidentiality, is applied to the ACS dataset used to create the flow files.[7] For previous migration flow releases, we applied the additional disclosure avoidance measure of suppressing flows with fewer than three cases for any flows with characteristics.[8] Flow counts and mover counts without characteristics, however, are not suppressed. The exact disclosure measures are determined by the Disclosure Review Board before each future product is released.[9]

For years that included characteristics (up to 2011-2015), complementary suppression was applied to the MSA flows by characteristics so that suppressed county flows cannot be derived. If one and only one county-to-county flow of all the flows that aggregate up to a MSA-to-MSA flow is suppressed, then

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[6] For more information on how Census data are protected see
<http://census.gov/about/policies/privacy/data_protection.html>.
[7] Data swapping was the main procedure used for protecting Census 2000 tabulations and is also used for ACS tabulations. In each case, a small percentage of household records are swapped. Pairs of households in different geographic regions are swapped. The selection process for deciding which households should be swapped is highly targeted to affect the records with the most disclosure risk. Pairs of households that are swapped match on a minimal set of demographic variables. All data products are created from the swapped data files (American Community Survey Design and Methodology, 2015).
[8] County and MCD characteristic flows containing only one or two people from different households, only one or two people in group quarters, or one person in group quarters and the rest from a single household are suppressed. People are only counted if they are in universe (e.g., population 1 year and over in households for relationship to householder).
[9] Prior to the 2010-2014 release, some suppressed county and MCD flows were summed up to the state of residence 1 year ago. Those estimates are no longer included in the tables.

the MSA flow is suppressed. This may include flows of all sizes. If an MSA-to-MSA flow is suppressed for a particular characteristic, some information about the flow can be obtained from the MSA-to-MSA flow table without characteristics along with the county-to-county flows by that characteristic within each MSA that are not suppressed. In addition to the MSA flows, complementary suppression is applied to county/MCD-to-county/MCD flows with characteristics.

Since some flows are suppressed, summary statistics for each county, MCD, or MSA (e.g., number of nonmovers, movers to a different state) are included in the flow files. Tables crossed by selected characteristics are published annually as part of the ACS standard data products available through American FactFinder (AFF) for both current residence and residence 1 year ago geography. The selected characteristics do not cover the same characteristics used in this release. [10] The Census Bureau applies separate disclosure avoidance rules to these tables containing residence 1 year ago estimates. The universe for each table must have at least 50 unweighted cases for the Census Bureau to publish the table. The same rules are applied to the county-to-county, county/MCD-to-county/MCD, and MSA-to-MSA files. If there is not a sufficient number of cases, the summary statistics for county, MCD, or MSA of residence 1 year ago by characteristics are not shown.

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[10] The tables in AFF are crossed by age (B07001 and B07401), median age (B07002 and B07402), sex (B07003 and B07403), race and Hispanic origin (B07004A-I and B07404A-I), citizenship status (B07007 and B07407), marital status (B07008 and B07408), educational attainment (B07009 and B07409), individual income (B07010 and B07410), median individual income (B07011 and B07411), poverty status (B07012 and B07412), and housing tenure (B07013 and B07413). The stubs for the characteristic tables in AFF refer to movement between states and counties and not MCDs or MSAs.

Blank Values:

There are blank cells within the tables. An estimate may be blank for the following reasons.

1. The estimate is out of scope for the ACS sample – such as supplemental statistics for world regions.
2. The estimate does not exist – such as movers to a different county in the same state for the District of Columbia.
3. The supplemental statistics for county of residence 1 year ago or MCD of residence 1 year ago were suppressed due to disclosure avoidance (characteristic files only).

In addition to blank estimates, flows with no records in the database and suppressed flows crossed by characteristics are not included in the files. The flows with no records are considered zero count estimates. The margins of error (MOE) for these zero count estimates cannot be calculated using the standard replicate variance formula.[11] For published ACS data products, the MOE for a zero count estimate is calculated using a different method. The standard errors for the zero count estimates are calculated by taking the square root of the product of the 90th percentile k-value and the average weight for the state of residence. Estimates for previous residence use the U.S. average weight. The standard error is then multiplied by 1.645 in order to get the 90 percent MOE.[12] Before the 2012 ACS, only a single k-value was used. The methodology was changed to account for more nuanced k-values. This resulted in 6 different k-values for 5-year ACS. They are assigned based upon the total population of an area. For certain geographies, the total population is the official population estimate. If there is no official population estimate available, then the total population may be found in table B01003 through American FactFinder.

Population Thresholds	k-value	Margin of Error	
		Using Minimum Average Weight (7)	Using Maximum Average Weight (16)
Less than 5,000	4	9	13
5,000 to less than 10,000	8	12	19
10,000 to less than 20,000	10	14	21
20,000 to less than 30,000	14	16	25
30,000 to less than 50,000	18	18	28
Greater than or equal to 50,000	22	20	31

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[11] For more information concerning the calculation of margins of error, see chapter 12 of *Design and Methodology: American Community Survey*. <http://www2.census.gov/programs-surveys/acs/methodology/design_and_methodology/acs_design_methodology_report_2014.pdf>

[12] More on the model to compute ACS margins of error for zero-estimate counts can be found at <http://www2.census.gov/programs-surveys/acs/tech_docs/user_notes/KValueUserNote.pdf>.

The average weights are calculated for each state of current residence and the k-value for the county of current residence is used. All estimates for residence 1 year ago and current residence estimates for metro areas that cross state lines should use the average weight for the United States.

State of Current Residence	Average Weight	State of Current Residence	Average Weight	State of Current Residence	Average Weight
Alabama	12	Maryland	13	South Carolina	14
Alaska	7	Massachusetts	13	South Dakota	8
Arizona	14	Michigan	9	Tennessee	13
Arkansas	12	Minnesota	7	Texas	15
California	13	Mississippi	14	Utah	11
Colorado	12	Missouri	11	Vermont	7
Connecticut	13	Montana	9	Virginia	13
Delaware	12	Nebraska	8	Washington	13
Dist. of Columbia	13	Nevada	14	West Virginia	11
Florida	16	New Hampshire	11	Wisconsin	7
Georgia	15	New Jersey	13	Wyoming	12
Hawaii	11	New Mexico	12	Puerto Rico	16
Idaho	12	New York	12		
Illinois	11	North Carolina	13	United States	12
Indiana	12	North Dakota	7		
Iowa	8	Ohio	11		
Kansas	9	Oklahoma	8		
Kentucky	12	Oregon	13		
Louisiana	13	Pennsylvania	9		
Maine	8	Rhode Island	14		

Coverage and Group Quarters Population:

The American Community Survey covers the entire population residing in the United States and Puerto Rico, both in housing units and group quarters facilities. Each year, independent housing unit address samples are selected for each county equivalent in the United States and Puerto Rico. Samples of group quarters facilities and persons in group quarters are done at the state level, including Puerto Rico and the District of Columbia. In order to provide a better representation of group quarters estimates over smaller areas, whole person imputation into not-in-sample group quarters facility was started with the 2011 ACS, including the 2007-2011 ACS 5-year estimates.[13] To better preserve the relationship between current and previous residence for these imputed cases, a recipient's county of residence 1 year ago is changed to the current county of residence if the donor moved within the same county; otherwise, the donor's county of residence 1 year ago is used for the imputation.

The group quarters population includes people living in correctional institutions, juvenile detention facilities, nursing homes, other long-term care facilities, college dormitories, military facilities, and other noninstitutionalized facilities. An occasional anomaly in the number of movers between a county pair can occur due to whole person group quarters imputation and higher rates of inter-county migration for people in group quarters compared to the general public. The 2011-2015 ACS inter-county mover rates for group quarters are shown in the table below. The estimated group quarters population for a county can be found in detailed table B26001 on American FactFinder.

	Population 1 year and over		Percent movers between counties within the United States		Percent movers from abroad	
	Estimate	MOE	Percent	MOE	Percent	MOE
Total:	312,784,059	+/-14,581	5.5	+/-0.1	0.6	+/-0.1
Group Quarters:	8,052,552	+/- 349	29.9	+/-0.1	1.8	+/-0.1
Adult correctional facilities	2,239,400	+/- 538	32.3	+/-0.3	1.0	+/-0.1
Nursing facilities/skilled facilities	1,498,277	+/- 27	8.3	+/-0.1	0.0	+/-0.1
College/university housing	2,620,428	+/- 27	41.5	+/-0.2	3.2	+/-0.1

Source: U.S. Census Bureau, 2011-2015 American Community Survey, Subject Table S2601B

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[13] For more information on ACS group quarters small area estimation, see <http://www2.census.gov/programs-surveys/acs/tech_docs/user_notes/GQSAE_User_Note.pdf>.

Application Programming Interface (API):

In 2016, all ACS migration flows data for counties, MCDs, and MSAs were made available in the Census API through the Census Developers site.[14] The API files contain the same estimates that were previously released in table form and Census Flows Mapper, but the data are provided in a different layout to allow developers to design web and mobile apps that include Census Bureau statistics. See the API website for more information.

Format of the Files:

There are separate text and Excel files for flows between counties, flows between metropolitan statistical areas (MSAs), and flows between minor civil divisions (MCDs) in some selected states. In several states, minor civil divisions are county subdivisions that are the primary governmental or administrative divisions of a county. In 12 states, the MCD governments serve as general-purpose local governments similar to incorporated municipalities.[15] In some of these states, county governments are limited or non-existent; therefore, MCDs are used as the main substate aggregate unit rather than counties. These 12 states are assigned MCD codes for residence 1 year ago during the geocoding process for ACS.

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[14] The Census Developers site is located at <http://www.census.gov/developers/>.
[15] For more information on geographic terms and concepts, see <http://census.gov/geo/www/reference.html>.

County-to-County Flow Files with No Characteristics

The county-to-county flow files are provided in two formats. There is one fixed field length national text file sorted by current residence geography. There is also an Excel file (.xlsx) containing a worksheet for each state of current residence, including Puerto Rico and the District of Columbia, and another Excel file containing a worksheet for each state of residence 1 year ago.

Besides the county of current residence, county of residence 1 year ago, and the number of movers between the two, the files also contain additional geographical mobility estimates for each county, along with the margin of error (MOE) at the 90 percent confidence level. (For further information about the geographies used for the files see Appendix A.)

The layout of the text file is as follows:

Field Description	Field Position
Current Residence FIPS State Code	1-3
Current Residence FIPS County Code	4-6
Residence 1 Year Ago FIPS State Code/U.S. Island Areas Code/Foreign Region Code	7-9
Residence 1 Year Ago FIPS County Code	10-12
Current Residence State Name	14-43
Current Residence County Name	44-78
Population 1 Year and Over Current County – Estimate	80-87
Population 1 Year and Over Current County – MOE	89-96
Nonmovers Current County – Estimate	98-104
Nonmovers Current County – MOE	106-112
Movers within the United States for Current County or within Puerto Rico for Current Municipio – Estimate	114-120
Movers within the United States for Current County or within Puerto Rico for Current Municipio – MOE	122-128
Movers within the Same County for Current County – Estimates	130-136
Movers within the Same County for Current County – MOE	138-144
Movers from a Different County in the Same State for Current County – Estimate	146-152
Movers from a Different County in the Same State for Current County – MOE	154-160
Movers from a Different State for Current County – Estimate	162-168
Movers from a Different State for Current County – MOE	170-176
Movers from Abroad – Estimate	178-184

Movers from Abroad – MOE	186-192
Residence 1 Year Ago State Name/U.S. Island Areas/Foreign Region	194-223
Residence 1 Year Ago County Name	224-258
Population That Lived in County 1 Year Ago – Estimate	260-267
Population That Lived in County 1 Year Ago – MOE	269-276
Nonmovers County of Residence 1 Year Ago – Estimate	278-284
Nonmovers County of Residence 1 Year Ago– MOE	286-292
Movers within the United States for County of Residence 1 Year Ago or within Puerto Rico for Municipio of Residence 1 Year Ago – Estimate	294-300
Movers within the United States for County of Residence 1 Year Ago or within Puerto Rico for Municipio of Residence 1 Year Ago – MOE	302-308
Movers within the Same County for County of Residence 1 Year Ago – Estimates	310-316
Movers within the Same County for County of Residence 1 Year Ago – MOE	318-324
Movers to a Different County in the Same State for County of Residence 1 Year Ago – Estimate	326-332
Movers to a Different County in the Same State for County of Residence 1 Year Ago – MOE	334-340
Movers to a Different State for County of Residence 1 Year Ago – Estimate	342-348
Movers to a Different State for County of Residence 1 Year Ago – MOE	350-356
Movers to Puerto Rico – Estimate	358-364
Movers to Puerto Rico – MOE	366-372
Movers within Flow – Estimate	374-380
Movers within Flow – MOE	382-388

County-to-County Net and Gross Migration Files (No Characteristics)

There are two files, text and Excel, that contains flow, counterflow, net migration, and gross migration for all county pairs (Geography A and Geography B). The Excel file has a worksheet for each state. Both files are sorted by Geography A. The flow shows the inmigration from Geography B to Geography A. The counterflow shows the outmigration from Geography A to Geography B. The net migration is the flow minus the counterflow, and the gross migration is the flow plus the counterflow.

The layout for the text file is as follows:

Field Description	Field Position
State/U.S. Island Area/Foreign Region Code of Geography A (state code based on FIPS code)	1-3
FIPS County Code of Geography A	4-6
State/U.S. Island Area/Foreign Region of Geography B (state code based on FIPS code)	7-9
FIPS County Code of Geography B	10-12
State/U.S. Island Area/Foreign Region Name of Geography A	14-43
County Name of Geography A	44-78
State/U.S. Island Area/Foreign Region Name of Geography B	80-109
County Name of Geography B	110-144
Flow from Geography B to Geography A – Estimate	146-153
Flow from Geography B to Geography A – MOE	155-162
Counterflow from Geography A to Geography B – Estimate	164-171
Counterflow from Geography A to Geography B – MOE	173-180
Net Migration from Geography B to Geography A – Estimate	182-189
Net Migration from Geography B to Geography A – MOE	191-198
Gross Migration between Geography A and Geography B – Estimate	200-207
Gross Migration between Geography A and Geography B – MOE	209-216

County-to-County Flow Files by Characteristics (includes 5-year periods up to 2011-2015)

There is a set of county-to-county files, text and Excel, for each characteristic. The county-to-county characteristic flow files have the same fields as the county-to-county flow files with the additional field for characteristic code in positions 14-15. The field contains relationship to householder code, household type code, or housing tenure code depending upon the file.

The layout of the text file is as follows:

Field Description	Field Position
Current Residence FIPS State Code	1-3
Current Residence FIPS County Code	4-6
Residence 1 Year Ago FIPS State Code/U.S. Island Areas Code/Foreign Region Code	7-9
Residence 1 Year Ago FIPS County Code	10-12

Characteristic Code
 	
Age Code:
    01 = 1 to 4 years
    02 = 5 to 17 years
    03 = 18 to 19 years
    04 = 20 to 24 years
    05 = 25 to 29 years
    06 = 30 to 34 years
    07 = 35 to 39 years
    08 = 40 to 44 years
    09 = 45 to 49 years
    10 = 50 to 54 years
    11 = 55 to 59 years
    12 = 60 to 64 years
    13 = 65 to 69 years
    14 = 70 to 74 years
    15 = 75 years and over
 	
Sex Code:
    01 = Male
    02 = Female
	14-15

Race Code:
 	
    01 = White alone
    02 = Black or African American alone
    03 = Asian alone
    04 = Other race alone or Two or more races
 	
Hispanic or Latino Origin:
 	
    01 = White alone, not Hispanic or Latino
    02 = Not white alone, not Hispanic or Latino
    03 = Hispanic or Latino	

Current Residence State Name	16-45
Current Residence County Name	46-80
Population Current County – Estimate	82-89
Population Current County – MOE	91-98
Nonmovers Current County – Estimate	100-106
Nonmovers Current County – MOE	108-114
Movers within the United States for Current County or within Puerto Rico for Current Municipio – Estimate	116-122
Movers within the United States for Current County or within Puerto Rico for Current Municipio – MOE	124-130
Movers within the Same County for Current County – Estimates	132-138
Movers within the Same County for Current County – MOE	140-146
Movers from a Different County in the Same State for Current County – Estimate	148-154
Movers from a Different County in the Same State for Current County – MOE	156-162
Movers from a Different State for Current County – Estimate	164-170
Movers from a Different State for Current County – MOE	172-178
Movers from Abroad – Estimate	180-186
Movers from Abroad – MOE	188-194
Residence 1 Year Ago State Name/U.S. Island Areas/Foreign Region	196-225
Residence 1 Year Ago County Name	226-260
Population That Lived in County 1 Year Ago – Estimate	262-269
Population That Lived in County 1 Year Ago – MOE	271-278
Nonmovers County of Residence 1 Year Ago – Estimate	280-286
Nonmovers County of Residence 1 Year Ago– MOE	288-294
Movers within the United States. for County of Residence 1 Year Ago or within Puerto Rico for Municipio of Residence 1 Year Ago – Estimate	296-302

Movers within the United States for County of Residence 1 Year Ago or within Puerto Rico for Municipio of Residence 1 Year Ago – MOE	304-310
Movers within the Same County for County of Residence 1 Year Ago – Estimates	312-318
Movers within the Same County for County of Residence 1 Year Ago – MOE	320-326
Movers to a Different County in the Same State for County of Residence 1 Year Ago – Estimate	328-334
Movers to a Different County in the Same State for County of Residence 1 Year Ago – MOE	336-342
Movers to a Different State for County of Residence 1 Year Ago – Estimate	344-350
Movers to a Different State for County of Residence 1 Year Ago – MOE	352-358
Movers to Puerto Rico – Estimate	360-366
Movers to Puerto Rico – MOE	368-374
Movers within Flow – Estimate	376-382
Movers within Flow – MOE	384-390

County/MCD-to-County/MCD Flow Files

The County/MCD-to-County/MCD files are similar to the county-to-county files except that MCDs are used instead of counties for Connecticut, Maine, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and Wisconsin.

There is one fixed field length national text file sorted by current residence geography. There is also an Excel file (.xlsx) containing a worksheet for each state of current residence, including Puerto Rico and the District of Columbia, and an another Excel file containing a worksheet for each state of residence 1 year ago.

In addition to the county or MCD of current residence, county or MCD of residence 1 year ago, and the number of movers between the two, the files also contain additional geographical mobility estimates for each county or MCD, along with the margin of error (MOE) at the 90 percent confidence level. (For further information about the geographies used for the files see Appendix A.)

The layout of the text file is as follows:

Field Description	Field Position
Current Residence FIPS State Code	1-3
Current Residence FIPS County Code	4-6
Current Residence FIPS MCD Code (CT, ME, MA, MN, MI, NH, NJ, NY, PA, RI, VT, WI only)	7-11
Residence 1 Year Ago FIPS State Code/U.S. Island Areas Code/Foreign Region Code	12-14
Residence 1 Year Ago FIPS County Code	15-17
Residence 1 Year Ago FIPS MCD Code (CT, ME, MA, MN, MI, NH, NJ, NY, PA, RI, VT, WI only)	18-22
Current Residence State Name	24-53
Current Residence County Name	54-88
Current Residence MCD Name (CT, ME, MA, MN, MI, NH, NJ, NY, PA, RI, VT, WI only)	89-133
Population 1 Year and Over Current County/MCD – Estimate	135-142
Population 1 Year and Over Current County/MCD – MOE	144-151
Nonmovers Current County/MCD – Estimate	153-159
Nonmovers Current County/MCD – MOE	161-167
Movers within the United States for Current County/MCD or within Puerto Rico for Current Municipio – Estimate	169-175

Movers within the United States for Current County/MCD or within Puerto Rico for Current Municipio – MOE	177-183
Movers within the Same County/MCD for Current County/MCD – Estimates	185-191
Movers within the Same County/MCD for Current County/MCD – MOE	193-199
Movers from a Different County/MCD in the Same State for Current County/MCD – Estimate	201-207
Movers from a Different County/MCD in the Same State for Current County/MCD – MOE	209-215
Movers from a Different State for Current County/MCD – Estimate	217-223
Movers from a Different State for Current County/MCD – MOE	225-231
Movers from Abroad – Estimate	233-239
Movers from Abroad – MOE	241-247
Residence 1 Year Ago State Name/U.S. Island Area/Foreign Region	249-278
Residence 1 Year Ago County Name	279-313
Residence 1 Year Ago MCD Name (CT, ME, MA, MN, MI, NH, NJ, NY, PA, RI, VT, WI only)	314-358
Population That Lived in County/MCD 1 Year Ago – Estimate	360-367
Population That Lived in County/MCD 1 Year Ago – MOE	369-376
Nonmovers County/MCD of Residence 1 Year Ago – Estimate	378-384
Nonmovers County/MCD of Residence 1 Year Ago– MOE	386-392
Movers within the United States for County/MCD of Residence 1 Year Ago or within Puerto Rico for Municipio of Residence 1 Year Ago – Estimate	394-400
Movers within the United States for County/MCD of Residence 1 Year Ago or within Puerto Rico for Municipio of Residence 1 Year Ago – MOE	402-408
Movers within the Same County/MCD for County/MCD of Residence 1 Year Ago – Estimates	410-416
Movers within the Same County/MCD for County/MCD of Residence 1 Year Ago – MOE	418-424
Movers to a Different County/MCD in the Same State for County/MCD of Residence 1 Year Ago – Estimate	426-432
Movers to a Different County/MCD in the Same State for County/MCD of Residence 1 Year Ago – MOE	434-440
Movers to a Different State for County/MCD of Residence 1 Year Ago – Estimate	442-448
Movers to a Different State for County/MCD of Residence 1 Year Ago – MOE	450-456
Movers to Puerto Rico – Estimate	458-464
Movers to Puerto Rico – MOE	466-472

Movers within Flow – Estimate	474-480
Movers within Flow – MOE	482-488

County/MCD-to-County/MCD Net and Gross Migration Files (No Characteristics)

There are two files, text and Excel, that contains flow, counterflow, net migration, and gross migration for all county/MCD pairs (Geography A and Geography B). The Excel file has a worksheet for each state. Both files are sorted by Geography A. The flow shows the inmigration from Geography B to Geography A. The counterflow shows the outmigration from Geography A to Geography B. The net migration is the flow minus the counterflow, and the gross migration is the flow plus the counterflow.

The layout for the text file is as follows:

Field Description	Field Position
State/U.S. Island Area/Foreign Region Code of Geography A (state code based on FIPS code)	1-3
FIPS County Code of Geography A	4-6
FIPS MCD Code of Geography A (CT, ME, MA, MN, MI, NH, NJ, NY, PA, RI, VT, WI only)	7-11
State/U.S. Island Area/Foreign Region Code of Geography B (state code based on FIPS code)	12-14
FIPS County Code of Geography B	15-17
FIPS MCD Code of Geography B (CT, ME, MA, MN, MI, NH, NJ, NY, PA, RI, VT, WI only)	18-22
State/U.S. Island Area/Foreign Region Name of Geography A	24-53
County Name of Geography A	54-88
MCD Name of Geography A (CT, ME, MA, MN, MI, NH, NJ, NY, PA, RI, VT, WI only)	89-133
State/U.S. Island Area/Foreign Region Name of Geography B	134-163
County Name of Geography B	164-198
MCD Name of Geography B (CT, ME, MA, MN, MI, NH, NJ, NY, PA, RI, VT, WI only)	199-243
Flow from Geography B to Geography A – Estimate	245-252
Flow from Geography B to Geography A – MOE	254-261
Counterflow from Geography A to Geography B – Estimate	263-270
Counterflow from Geography A to Geography B – MOE	272-279
Net Migration from Geography B to Geography A – Estimate	281-288
Net Migration from Geography B to Geography A – MOE	290-297
Gross Migration between Geography A and Geography B – Estimate	299-306
Gross Migration between Geography A and Geography B – MOE	308-315

County/MCD-to-County/MCD Flow Files by Characteristics

There is a set of county/MCD-to-county/MCD files, text and Excel, for each of the three characteristics. The county/MCD-to-county/MCD characteristic flow files have the same fields as the county/MCD-to-county/MCD flow files with the additional field for characteristic code in positions 24-25. The field contains relationship to householder code, household type code, or housing tenure code depending upon the file.

The layout of the text file is as follows:

Field Description	Field Position
Current Residence FIPS State Code	1-3
Current Residence FIPS County Code	4-6
Current Residence FIPS MCD Code (CT, ME, MA, MN, MI, NH, NJ, NY, PA, RI, VT, WI only)	7-11
Residence 1 Year Ago FIPS State Code/U.S. Island Areas Code/Foreign Region Code	12-14
Residence 1 Year Ago FIPS County Code	15-17
Residence 1 Year Ago FIPS MCD Code (CT, ME, MA, MN, MI, NH, NJ, NY, PA, RI, VT, WI only)	18-22

Characteristic Code
 	
Age Code:
    01 = 1 to 4 years
    02 = 5 to 17 years
    03 = 18 to 19 years
    04 = 20 to 24 years
    05 = 25 to 29 years
    06 = 30 to 34 years
    07 = 35 to 39 years
    08 = 40 to 44 years
    09 = 45 to 49 years
    10 = 50 to 54 years
    11 = 55 to 59 years
    12 = 60 to 64 years
    13 = 65 to 69 years
	24-25

14 = 70 to 74 years
15 = 75 years and over
 	
Sex Code:
    01 = Male
    02 = Female
 	
Race Code:
    01 = White alone
    02 = Black or African American alone
    03 = Asian alone
    04 = Other race alone or Two or more races
 	
Hispanic or Latino Origin:
    01 = White alone, not Hispanic or Latino
    02 = Not white alone, not Hispanic or Latino
    03 = Hispanic or Latino	

Current Residence State Name	26-55
Current Residence County Name	56-90
Current Residence MCD Name (CT, ME, MA, MN, MI, NH, NJ, NY, PA, RI, VT, WI only)	91-135
Population Current County/MCD – Estimate	137-144
Population Current County/MCD – MOE	146-153
Nonmovers Current County/MCD – Estimate	155-161
Nonmovers Current County/MCD – MOE	163-169
Movers within the U.S. for Current County/MCD or within Puerto Rico for Current Municipio – Estimate	171-177
Movers within the U.S. for Current County/MCD or within Puerto Rico for Current Municipio – MOE	179-185
Movers within the Same County/MCD for Current County/MCD – Estimates	187-193
Movers within the Same County/MCD for Current County/MCD – MOE	195-201
Movers from a Different County/MCD in the Same State for Current County/MCD – Estimate	203-209
Movers from a Different County/MCD in the Same State for Current County/MCD – MOE	211-217
Movers from a Different State for Current County/MCD – Estimate	219-225
Movers from a Different State for Current County/MCD – MOE	227-233
Movers from Abroad – Estimate	235-241

Movers from Abroad – MOE	243-249
Residence 1 Year Ago State Name/U.S. Island Area/Foreign Region	251-280
Residence 1 Year Ago County Name	281-315
Residence 1 Year Ago MCD Name (CT, ME, MA, MN, MI, NH, NJ, NY, PA, RI, VT, WI only)	316-360
Population That Lived in County/MCD 1 Year Ago – Estimate	362-369
Population That Lived in County/MCD 1 Year Ago – MOE	371-378
Nonmovers County/MCD of Residence 1 Year Ago – Estimate	380-386
Nonmovers County/MCD of Residence 1 Year Ago– MOE	388-394
Movers within the U.S. for County/MCD of Residence 1 Year Ago or within Puerto Rico for Municipio of Residence 1 Year Ago – Estimate	396-402
Movers within the U.S. for County/MCD of Residence 1 Year Ago or within Puerto Rico for Municipio of Residence 1 Year Ago – MOE	404-410
Movers within the Same County/MCD for County/MCD of Residence 1 Year Ago – Estimates	412-418
Movers within the Same County/MCD for County/MCD of Residence 1 Year Ago – MOE	420-426
Movers to a Different County/MCD in the Same State for County/MCD of Residence 1 Year Ago – Estimate	428-434
Movers to a Different County/MCD in the Same State for County/MCD of Residence 1 Year Ago – MOE	436-442
Movers to a Different State for County/MCD of Residence 1 Year Ago – Estimate	444-450
Movers to a Different State for County/MCD of Residence 1 Year Ago – MOE	452-458
Movers to Puerto Rico – Estimate	460-466
Movers to Puerto Rico – MOE	468-474
Movers within Flow – Estimate	476-482
Movers within Flow – MOE	484-490

MSA-to-MSA Flow Files with No Characteristics

The MSA-to-MSA flow files are provided in two formats. There is one fixed field length national text file sorted by current residence geography. There is also an Excel file (.xlsx) containing flows between all the MSAs in the United States and Puerto Rico and the District of Columbia.

In addition to the MSA of current residence, MSA of residence 1 year ago, and the number of movers between the two, the files also contain additional geographical mobility estimates for each MSA along with the margin of error (MOE) at the 90 percent confidence level. (For further information about the geographies used for the files see Appendix A.)

The layout of the text file is as follows:

Field Description	Field Position
Current Residence MSA Code (February 2013 delineations)	1-5
Residence 1 Year Ago MSA Code (February 2013 delineations)	6-10
Current Residence MSA Name	12-71
Population 1 Year and Over Current MSA – Estimate	73-80
Population 1 Year and Over Current MSA – MOE	82-89
Nonmovers Current MSA – Estimate	91-97
Nonmovers Current MSA – MOE	99-105
Movers within the Same MSA – Estimate	107-113
Movers within the Same MSA – MOE	115-121
Movers from a Different MSA for Current MSA – Estimate	123-129
Movers from a Different MSA for Current MSA – MOE	131-137
Movers from Elsewhere in the United States or Puerto Rico for Current MSA – Estimate	139-145
Movers from Elsewhere in the United States or Puerto Rico for Current MSA – MOE	147-153
Movers from Abroad (not including Puerto Rico) – Estimate	155-161
Movers from Abroad (not including Puerto Rico) – MOE	163-169
Residence 1 Year Ago MSA Name	171-230
Population That Lived in MSA 1 Year Ago – Estimate	232-239
Population That Lived in MSA 1 Year Ago – MOE	241-248
Nonmovers MSA of Residence 1 Year Ago – Estimate	250-256
Nonmovers MSA of Residence 1 Year Ago– MOE	258-264
Movers within the Same MSA – Estimate	266-272

Movers within the Same MSA – MOE	274-280
Movers to a Different MSA for MSA of Residence 1 Year Ago – Estimate	282-288
Movers to a Different MSA for MSA of Residence 1 Year Ago – MOE	290-296
Movers to Elsewhere in the United States or Puerto Rico for MSA of Residence 1 Year Ago – Estimate	298-304
Movers to Elsewhere in the United States or Puerto Rico for MSA of Residence 1 Year Ago – MOE	306-312
Movers within Flow – Estimate	314-320
Movers within Flow – MOE	322-328

MSA-to-MSA Net and Gross Migration Files (No Characteristics)

There are two files, text and Excel, that contains flow, counterflow, net migration, and gross migration for all msa pairs (Geography A and Geography B). The Excel file has a single worksheet for all flows. Both files are sorted by Geography A. The flow shows the inmigration from Geography B to Geography A. The counterflow shows the outmigration from Geography A to Geography B. The net migration is the flow minus the counterflow, and the gross migration is the flow plus the counterflow.

The layout for the text file is as follows:

Field Description	Field Position
MSA Code (February 2013 delineations) of Geography A	1-5
MSA Code (February 2013 delineations) of Geography A	6-10
MSA Name of Geography A	12-71
MSA Name of Geography A	72-131
Flow from Geography B to Geography A – Estimate	133-140
Flow from Geography B to Geography A – MOE	142-149
Counterflow from Geography A to Geography B – Estimate	151-158
Counterflow from Geography A to Geography B – MOE	160-167
Net Migration from Geography B to Geography A – Estimate	169-176
Net Migration from Geography B to Geography A – MOE	178-185
Gross Migration between Geography A and Geography B – Estimate	187-194
Gross Migration between Geography A and Geography B – MOE	196-203

MSA-to-MSA Flow Files by Characteristics (includes 5-year periods up to 2011-2015)

There is a set of MSA-to-MSA files, text and Excel, for each of the three characteristics. The MSA-to-MSA characteristic flow files have the same fields as the MSA-to-MSA flow files with the additional field for characteristic code in positions 12-13. The field contains relationship to householder code, household type code, or housing tenure code depending upon the file.

The layout of the text file is as follows:

Field Description	Field Position
Current Residence MSA Code (February 2013 delineations)	1-5
Residence 1 Year Ago MSA Code (February 2013 delineations)	6-10

Characteristic Code
 	
Age Code:
        01 = 1 to 4 years
        02 = 5 to 17 years
        03 = 18 to 19 years
        04 = 20 to 24 years
        05 = 25 to 29 years
        06 = 30 to 34 years
        07 = 35 to 39 years
        08 = 40 to 44 years
        09 = 45 to 49 years
        10 = 50 to 54 years
        11 = 55 to 59 years
        12 = 60 to 64 years
        13 = 65 to 69 years
        14 = 70 to 74 years
        15 = 75 years and over
 	
Sex Code:
        01 = Male
        02 = Female
 	
Race Code:
        01 = White alone
        02 = Black or African American alone
	12-13

03 = Asian alone
04 = Other race alone or Two or more races
 	
Hispanic or Latino Origin:
    01 = White alone, not Hispanic or Latino
    02 = Not white alone, not Hispanic or Latino
    03 = Hispanic or Latino	

Current Residence MSA Name	14-73
Population 1 Year and Over Current MSA – Estimate	75-82
Population 1 Year and Over Current MSA – MOE	84-91
Nonmovers Current MSA – Estimate	93-99
Nonmovers Current MSA – MOE	101-107
Movers within the Same MSA – Estimate	109-115
Movers within the Same MSA – MOE	117-123
Movers from a Different MSA for Current MSA – Estimate	125-131
Movers from a Different MSA for Current MSA – MOE	133-139
Movers from Elsewhere in the U.S. or Puerto Rico for Current MSA – Estimate	141-147
Movers from Elsewhere in the U.S. or Puerto Rico for Current MSA – MOE	149-155
Movers from Abroad (not including Puerto Rico) – Estimate	157-163
Movers from Abroad (not including Puerto Rico) – MOE	165-171
Residence 1 Year Ago MSA Name	173-232
Population That Lived in MSA 1 Year Ago – Estimate	234-241
Population That Lived in MSA 1 Year Ago – MOE	243-250
Nonmovers MSA of Residence 1 Year Ago – Estimate	252-258
Nonmovers MSA of Residence 1 Year Ago– MOE	260-266
Movers within the Same MSA – Estimate	268-274
Movers within the Same MSA – MOE	276-282
Movers to a Different MSA for MSA of Residence 1 Year Ago – Estimate	284-290
Movers to a Different MSA for MSA of Residence 1 Year Ago – MOE	292-298
Movers to Elsewhere in the U.S. or Puerto Rico for MSA of Residence 1 Year Ago – Estimate	300-306
Movers to Elsewhere in the U.S. or Puerto Rico for MSA of Residence 1 Year Ago – MOE	308-314
Movers within Flow – Estimate	316-322
Movers within Flow – MOE	324-330

Appendix A: Geography

<u>County Equivalents</u>

Counties are the primary legal division in most states, but a few states have equivalent divisions known by different names. In order to get a complete partition of the United States and Puerto Rico, the following divisions are treated as county equivalents in the files.

Borough (Alaska)
Census Area (Alaska)
City and Borough (Alaska)
County (All except Alaska, the District of Columbia, Louisiana, and Puerto Rico)
The District of Columbia
Independent City (Maryland, Missouri, Nevada, Virginia)[16]
Municipality (Alaska)
Municipio (Puerto Rico)
Parish (Louisiana)

<u>Minor Civil Divisions</u>

The county/MCD-to-county/MCD files include minor civil division estimates for the 12 states in which they also serve as general-purpose local governments. The 12 states have various names for their minor civil divisions.

Connecticut (City, Town)
Maine (City, Gore, Indian Reservation, Plantation, Town, Unorganized Territory)
Massachusetts (City, Town)
Michigan (Charter Township, City, Township)
Minnesota (City, Township, Unorganized Territory)
New Hampshire (City, Grant, Location, Town, Township)
New Jersey (Borough, City, Purchase, Town, Township, Village)
New York (Borough, City, Indian Reservation, Town)
Pennsylvania (Borough, City, Town, Township)
Rhode Island (City, Town)
Vermont (City, Gore, Grant, Town)
Wisconsin (City, Town, Village)

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[16] In previous county-to-county flows products, some counties and independent cities were collapsed into single entities due to cognitive and geographic coding problems with migration data for places. (For the Census 2000 list of combined Virginia counties and independent cities see Appendix B in Migration DVD documentation at <http://census.gov/population/www/cen2000/migration/mig_dvd.html>).

Puerto Rico

Prior to the 2008 ACS, the stateside questionnaire only requested respondents to answer "Puerto Rico" if they lived in Puerto Rico 1 year ago. The Puerto Rico questionnaire asked for a municipio or a U.S. county for movers, along with other geographic information; therefore, municipio level migration flow data from Puerto Rico to the United States are not available prior to 2008 but are available for flow from the United States to each Puerto Rico municipio.

The question was revised in 2008 to ask for the same geographic information on the Puerto Rico and stateside questionnaire allowing estimates to be calculated for both flow directions. Because of this limitation, prior ACS county-to-county migration flow files aggregated flows from Puerto Rico to the United States to "Puerto Rico" rather than individual municipios. The 2008-2012 files are the first to include flows from Puerto Rico municipios to U.S. counties. Puerto Rico municipios are treated as equivalent to U.S. counties.

U.S. Island Areas and Foreign Countries

Outmigration from the United States and Puerto Rico to U.S. Island Areas or foreign countries is not available from the American Community Survey since only housing units and group quarters (e.g., college dormitories, military barracks, prisons) within the United States and Puerto Rico are sent questionnaires. The American Community Survey does collect data for U.S. Island Area or Foreign Country of residence 1 year ago. The files include inmigration from outside the United States and Puerto Rico aggregated to U.S. Island Areas and foreign region. A three letter code is used to identify these areas.

U.S. Island Areas (ISL):
American Samoa, Baker Island, Guam, Howland Island, Jarvis Island, Johnston Atoll, Kingman Reef, Northern Marianas Islands, Midway Islands, Navassa Island, Palmyra Atoll, U.S. Virgin Islands, Wake Island, U.S. Island Areas not specified.

Europe (EUR):
Albania, Andorra, Austria, Azores Islands, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czechoslovakia, Czech Republic, Denmark, England, Estonia, Faroe Islands, Finland, France, Germany, Gibraltar, Greece, Guernsey, Hungary, Iceland, Ireland, Isle of Man, Italy, Jan Mayen, Jersey, Kosovo, Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Malta, Madeira Islands, Moldova, Monaco, Montenegro, Netherlands, Northern Ireland, Norway, Poland, Portugal, Romania, Russia, San Marino, Scotland, Serbia, Slovakia, Slovenia, Spain, Svalbard, Sweden, Switzerland, Ukraine, United Kingdom, USSR, Vatican City, Wales, Yugoslavia, Europe not specified.

Asia (ASI):

Afghanistan, Armenia, Azerbaijan, Bahrain, Bangladesh, Bhutan, Brunei, Cambodia, China, Cyprus, East Timor, Georgia, Hong Kong, India, Indonesia, Iran, Iraq, Israel, Japan, Jordan, Korea, Kazakhstan, Kyrgystan, Kuwait, Laos, Lebanon, Macau, Malaysia, Maldives, Mongolia, Myanmar (Burma), Nepal, North Korea, Oman, Pakistan, Paracel Islands, Philippines, Qatar, Saudi Arabia, Singapore, South Korea, Spratley Islands, Sri Lanka, Syria, Taiwan, Tajikistan, Thailand, Turkey, Turkmenistan, United Arab Emirates, Uzbekistan, Vietnam, Yemen, Asia not specified.

Northern America (NAM):
Bermuda, Canada, Greenland, St. Pierre & Miquelon, North American not specified

Central America (CAM):
Belize, Costa Rico, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Central America not specified

Caribbean (CAR):
Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados, Bonaire, British Virgin Islands, Cayman Islands, Cuba, Curaçao, Dominica, Dominican Republic, Grenada, Guadeloupe, Haiti, Jamaica, Martinique, Montserrat, Netherland Antilles, Saba, St. Barthelemy, St. Kitts-Nevis, St. Lucia, St. Vincent and the Grenadines, Sint Eustatius, Sint Maarten, Trinidad and Tobago, Turks and Caicos Islands, West Indies not specified

South America (SAM):
Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Falkland Islands, French Guiana, Guyana, Paraguay, Peru, Suriname, Uruguay, Venezuela, South American not specified

Africa (AFR):
Algeria, Angola, Benin, Botswana, British Indian Ocean Territory, Burkina Faso, Burundi, Cameroon, Cabo Verde, Central African Republic, Chad, Comoros, Congo, Democratic Republic of Congo, Djibouti, Egypt, Equatorial Guinea, Ethiopia, Eritrea, Europa Island, Gabon, Gambia, Ghana, Glorioso Islands, Guinea, Guinea-Bissau, Ivory Coast, Juan de Nova Island, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mayotte, Morocco, Mozambique, Namibia, Niger, Nigeria, Reunion, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, St Helena, Sudan, Swaziland, Tanzania, Togo, Tromelin Island, Tunisia, Uganda, Western Sahara, Zambia, Zimbabwe, Africa not specified

Oceania and At Sea (OCE):
Australia, Christmas Island, Cook Islands, Coral Sea Islands, Heard and McDonald Islands, Fiji, French Polynesia, Kiribati, Marshall Islands, Micronesia, Nauru, New Caledonia, New Zealand, Niue, Norfolk

Island, Palau, Papua New Guinea, Pitcairn Islands, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, Wallis and Futuna Islands, Samoa, Oceania not specified, At sea

References:

Benetsky, Megan and Kin Koerber. *2005-2009 American Community Survey County-to-County Migration Files.*
<http://www.census.gov/library/working-papers/2012/demo/benetsky-02.html>

Bortlein, Celia G. and Alan K. Peterson. *Evaluation Report Covering Residence 1 Year Ago*, 2007.
<http://www.census.gov/library/working-papers/2007/acs/2007_Boertlein_01.html>

U.S. Census Bureau. *American Community Survey Design and Methodology (January 2014)*. Washington, D.C.: U.S Government Printing Office, 2014.
<http://census.gov/programs-surveys/acs/methodology/design-and-methodology.html>

U.S. Census Bureau. *Puerto Rico Community Survey Multiyear Accuracy of the Data (5-year 2011-2015).*
<https://www2.census.gov/programs-surveys/acs/tech_docs/accuracy/MultiyearACSAccuracyofData2015.pdf>

Zayatz, Laura. "Disclosure Avoidance Practices and Research at the U.S. Census Bureau: An Update." *Research Report Series 2005-06.* Statistical Research Division, U.S. Census Bureau, Washington, D.C., August 31, 2005.
<http://census.gov/srd/papers/pdf/rrs2005-06.pdf>