

URBAN UPDATE/LEAVE AND UPDATE/ENUMERATE IN CENSUS 2000¹

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Abstract: Urban Update/Leave and Update/Enumerate were two special enumeration procedures in Census 2000. In Urban Update/Leave, enumerators delivered the census questionnaires and updated their address registers and census maps concurrently. Respondents returned their completed census questionnaires by mail. In Update/Enumerate, enumerators updated their address registers and census maps and enumerated the housing unit at the time of their visit. This paper gives a quantitative overview of these two operations and their ability to improve the address list.

The Decennial Master Address File (DMAF) and type-of-enumeration areas (TEAs)

The Master Address File (MAF) is the Census Bureau's permanent address list. It was originally created using the 1990 Address Control File (the 1990 census address list) and the November 1997 or earlier U.S. Postal Service Delivery Sequence Files (the postal address list). The Census Bureau extracts addresses from the MAF to conduct its censuses and surveys. For Census 2000, the Census Bureau specified a census universe from the MAF, called the DMAF. The DMAF consisted of residential addresses that were geocoded—that is, linked to address ranges in the Topologically Integrated Geographic Encoding and Referencing (TIGER) database.

The Census Bureau assigned TEAs at the block level. The TEAs reflect the enumeration methodology, including the method of compiling the DMAF. Of interest in this paper are three TEAs: Urban Update/Leave (UU/L), "Rural" Update/Enumerate (U/E), and "Urban"U/E. Together Rural U/E and Urban U/E are referred to as U/E.

Creation of the DMAF in Rural U/E began from scratch with Address Listing.

In UU/L and Urban U/E, we extracted the DMAF from the MAF. Before DMAF creation, we field-checked MAF addresses in areas with house number-street name addresses (referred to as city-style addresses) in the door-to-door Block Canvassing operation.

Introduction to the UU/L and U/E operations

The objective of the UU/L operation was to improve coverage in the following ways:

- improving the deliverability of the questionnaires, and
- updating address information and census maps

The UU/L blocks were originally Mailout/Mailback blocks. Mailout/Mailback was the enumeration methodology for most areas that had mail delivery to city-style addresses. In Mailout/Mailback, housing units received the census questionnaires by mail and were asked to return the completed questionnaires by mail. The UU/L operation targeted areas deemed unsuitable for Mailout/Mailback. Examples are multi-unit buildings where the U.S. Postal Service (USPS) delivers the mail to a drop point instead of individual unit designations and urban communities that had city-style addresses but many residents had mail delivered to post office boxes. The Urban Update/Leave operation relied on the local regions to identify areas based on their knowledge of whether the United States Postal Service could adequately deliver the census questionnaires. Ethnographic studies encourage local involvement, including tapping community-based organizations, in planning and conducting the census.

Eight of the twelve Regional Census Centers (RCCs) identified blocks for UU/L. The 8 participating RCCs were Atlanta, Boston, Chicago, Dallas, Denver, Detroit, Philadelphia, and Seattle. The 4 non-participating RCCs were Charlotte, Kansas City, Los Angeles, and New York.

Operationally in UU/L areas, enumerators delivered the census questionnaires and updated their address registers (i.e., the DMAF) and census maps. Residents were asked to complete and return by mail their census questionnaires. The operation took place from March 3 to March 31, 2000. Housing units that did not mail in their completed questionnaire as of April 18, 2000, were visited during Nonresponse Followup.

Update/Enumerate targeted communities with special enumeration needs and where most housing units may not have had city-style mailing addresses. These areas included resort areas with high concentrations of seasonally vacant housing units, selected American Indian reservations and colonias; the latter generally are Hispanic-occupied unincorporated communities near the Mexican border. Going directly to the field saves time and money in areas where we have concerns about responsiveness.

Update/Enumerate was similar to UU/L, except that interviewers enumerated the housing unit at the time of their visit rather than leaving a questionnaire to be completed and mailed back. In both operations the

¹This paper reports the results of research and analysis undertaken by Census Bureau staff. It has undergone a Census Bureau review more limited in scope than that given to official Census Bureau publications. This report is released to inform interested parties of ongoing research and to encourage discussion of work in progress.

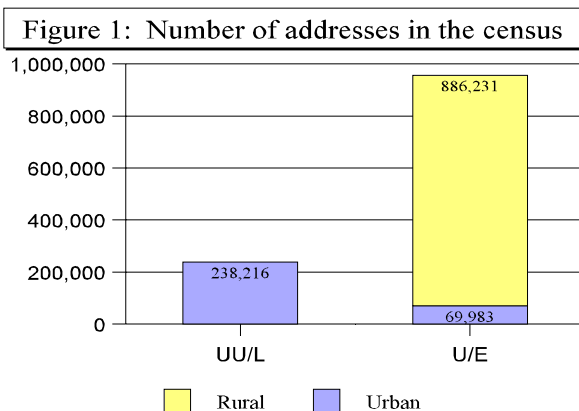
enumerator updated the address registers and census maps. The U/E operation took place from March 13 to June 5, 2000. Detroit was the only RCC that did not participate in U/E.

What were the relative sizes of UU/L and U/E?

On the MAF in UU/L blocks were 314,059 addresses. After removing known duplicates, there were 310,114 addresses. Of the 310,114 addresses, 280,086 addresses, or 90.3%, were delivered to the DMAF. Ultimately, 238,216 UU/L addresses, 85.1 percent of the DMAF addresses, were enumerated in the census as either occupied or vacant housing units. The 41,870 addresses on the DMAF and not in the census were deleted addresses; that is, they were determined not to be valid housing units. Addresses either excluded from or included in the census may have been categorized erroneously.

There were 1,191,835 addresses on the MAF in U/E blocks (1,091,848 in Rural U/E and 99,987 in Urban U/E). After removing known duplicates, there were 1,169,090 addresses on the MAF (1,072,744 in Rural U/E and 96,346 in Urban U/E). On the DMAF were 1,056,317 addresses (991,378 in Rural U/E and 64,939 in Urban U/E), 90.4% of the 1,169,090 MAF addresses. Ultimately, 956,214 U/E addresses, 90.5 percent of the DMAF addresses, were enumerated in the census as either occupied or vacant housing units (886,231 in Rural U/E and 69,983 in Urban U/E). The 100,103 addresses on the DMAF and not in the census were deleted addresses; that is, they were determined not to be valid housing units. Addresses either excluded from or included in the census may have been categorized erroneously.

Figure 1 shows pictorially the relative sizes of UU/L



and U/E. By comparison, Mailout/Mailback areas, the largest TEA, had 92,451,759 addresses in the census.

How much address updating was in UU/L and U/E?

Tables 1 and 2 (see end of paper for tables) show what happened to addresses that were printed in the address registers. (Our universe approximating the address registers is addresses on the DMAF less addresses added

during questionnaire delivery in UU/L and field enumeration in U/E.) For each address in an address register, an enumerator compared the address information in the register to what was on the ground. The enumerator either verified (i.e., accepted) the house number and street name address/location description or updated the address. Enumerators performed the following address updates: correction of street name and/or unit designation of an address and deletion of nonexistent or nonresidential addresses. A block move took place when an address was deleted in one block and added in another. The classification of block move occurred during processing and not during the operation. If an address was both corrected and moved, we classified the address as a block move. The address action taken in UU/L or U/E in conjunction with whether the address could be geocoded and the results from other census operations determined ultimately whether or not the housing unit was counted in the census.

For the UU/L universe, the verify code was not data captured. We assumed housing units with an undetermined action code were verified. Using this assumption, the number verified in UU/L is probably overstated. In the U/E universe, the verify code was data captured, and so Table 2 does not combine verified housing units and housing units with an undetermined action code.

Most addresses—81.9%—were verified; 18.1% of addresses had updates. The most frequent update was delete, 14.6% (deletion plus nonresidential). Of the original 267,005 addresses on the UU/L address registers, 227,761, or 85.3% were in the census.

There were 13,131 UU/L additions during questionnaire delivery, a 4.9% increase to the addresses printed in the address registers. Of these additions, 13,081 made it to the DMAF, and 10,455 were in the census.

Over half of the U/E addresses, 61.9%, were verified, and 37.2% were updated. The most frequent update was correction, 30.7% of all U/E addresses. Of the original 926,861 addresses in the address registers, 833,479, or 89.9% were in the census.

There were 129,692 U/E additions during field enumeration, a 12.5% increase to the addresses printed in the address registers. Of these additions, 129,456 made it to the DMAF, and 122,735 were in the census.

How well were UU/L and U/E targeted? (limited to addresses in the census, unless otherwise noted)

Not all UU/L blocks had housing units. There were 5,186 blocks, 40.4%, with no housing units in the census. The high percentage of blocks with no housing units indicates that many blocks did not have the high housing unit densities expected for UU/L areas. In U/E, there were 108,062 blocks, 58.8%, with no housing units in the census. Some of the blocks with no housing units could be blocks consisting of only commercial structures and may be included to create contiguous assignment areas.

Table 3 is a description of the addresses by type of address. We classify addresses into five categories based on the highest criterion met. The categories are complete city-style, complete rural route, complete post office box, incomplete address, and no address information.

- The complete city-style category includes all housing units that had a complete city-style address, which consists of a house number and street name.
- The complete rural route category includes housing units that did not have a complete city-style address, but did have a complete rural route (or highway contract route) address, such as Rural Route 2, Box 3.
- The complete post office box category includes housing units that did not have a complete city-style or complete rural route address, but did have a complete post office box address, such as P.O. Box 5.
- The incomplete category includes housing units that had some address information but did not have a complete address of any type.
- The no address information category includes housing units that are missing house number, street name, rural route, and post office box information.

Addresses are further delineated by whether or not the address had a physical/location description provided during a census field operation.

Most of the UU/L addresses, 99.1%, were complete city-style addresses. Though not surprising—because this operation occurred in urban areas of the country, which typically have complete city-style addresses—targeting areas where many residents picked up their mail at post office boxes was not successful. The majority of the remaining addresses had incomplete address information.

In U/E, 67.7% of addresses were complete city-style and 18.4% of addresses had incomplete or no address information. These high rates of incomplete or no address information indicate successful targeting of areas with mail delivery problems.

Table 4 crosses size of basic street address by USPS Delivery Sequence File (DSF) match status.

A multi-unit structure has multiple unit designations at the same basic street address; for example, an apartment building. We would expect it to be easier to deliver mail to the correct unit in blocks with lower multi-unit concentrations.

Single-unit UU/L housing units in the census were slightly more likely to match the DSF than multi-unit UU/L housing units, 87.2% versus 85.7%, respectively. Both percentages were close to the overall rate of 86.6% of UU/L addresses matching the DSF. There was a higher percent of multi-units in UU/L areas, 42.8% than in U/E areas, 13.3% (Table 4).

Overall, there were 2,065 drop delivery addresses (not shown in a table), or 0.9% of UU/L housing units in the census. Of the 2,065 drop delivery addresses, 613 addresses, or 29.7%, were single-unit housing units. The fact that we identified drop delivery addresses at single-

unit structures highlights the limitations of the drop delivery and size of basic street address variables. In areas where the USPS delivers to a drop delivery point, we have low confidence in the delivery of the right census questionnaire to the corresponding unit within a multi-unit structure. Very few areas had high concentrations of drop delivery addresses, and the measure itself was suspect.

Addresses in U/E include seasonal housing units and colonias, both of which may have irregular or incomplete addresses. Table 4 shows that multi-unit U/E housing units were more likely to match the DSF than single-unit U/E housing units, 36.3% vs. 26.5%, respectively. The DSF match rate, overall, was low, 27.8%.

Matching the census tracts to the Planning Database, 189,045 addresses, 79.4% of UU/L addresses in the census, were in tracts that could be matched; and 566,399 addresses, 59.2% of U/E addresses, were in tracts that could be matched.

Table 5 shows the hard-to-count classes for addresses that match to a census tract on the Planning Database. Of the 424 tracts that had UU/L housing units in the census, 355 tracts, or 83.7% could be matched to a census tract on the Planning Database. Of the 1,051 tracts that had U/E housing units in the census, 572 tracts, or 54.4% could be matched to a census tract on the Planning Database.

The hard-to-count scores are a composite measure of characteristics correlated with success in counting people. The scores are from 0 to 132 and are grouped into ten classes, with one being the most difficult to count and ten being the easiest to count.

For UU/L, close to one-quarter of the addresses were in the hardest hard-to-count class. Nearly half of the addresses, 47.1%, were in the top three hard-to-count classes (classes 1, 2, and 3). Nearly one-quarter of the addresses were in the bottom three hard-to-count classes (classes 8, 9, and 10). So, while we identified addresses in the hardest-to-count classes, we also identified addresses in tracts not considered hard-to-count.

For U/E, we covered a wide range of hard-to-count classes. While about one quarter of the addresses were in the top three hard-to-count classes (classes 1, 2, and 3) and few addresses, 0.6%, were in the bottom two hard-to-count classes (classes 9 and 10), U/E was not limited to the most difficult hard-to-count classes. These results show that we followed the 1995 Census Test recommendation to not target U/E based on hard-to-enumerate criteria.

Table 6 shows how many UU/L census addresses were in Nonresponse Followup and Coverage Improvement Followup. The analysis includes all UU/L addresses delivered to the DMAF, 280,086 addresses.

A greater percentage of UU/L addresses on the DMAF required contact in Nonresponse Followup than in Coverage Improvement Followup, 45.2% versus 16.2%, respectively.

Table 7 shows the occupancy status for those housing units in the census. The UU/L vacancy rate, 14.9%, was

higher than the national rate, 9.0%.

Collectively, Tables 6 and 7 show that maybe some UU/L areas should have been designated as U/E areas to save the additional visit to the housing unit. In U/E areas, the housing unit is enumerated at the time of updating the address registers, instead of leaving the questionnaire and perhaps having to revisit the housing unit in Nonresponse Followup and/or Coverage Improvement Followup.

Table 7 also shows the occupancy status for U/E housing units in the census. The U/E vacancy rate, as expected, was higher than the national rate, 38.7% vs. 9.0%, respectively. Update/Enumerate targeted areas with high vacancy rates.

The results for Tables 8 and 9 are for housing units on the Decennial Response File–Stage 2 (DRF2). The variables of interest from this file were the number of proxy interviews and the number of interviews conducted in Spanish. We report the results in terms of the number of returns (census questionnaires) on the DRF2. There were 1,056,046 returns on the DRF2, and 110,559 housing units, 10.5%, had more than one return.

Overall, 41.6% of returns were proxies. The high proxy rate is probably due to the high vacancy rate for the seasonal housing in U/E areas.

We interviewed some respondents in Spanish. In U/E, we conducted 3.5% of interviews in Spanish. Part of the Rural U/E universe was colonias that may be linguistically isolated.

Conclusions

We were successful in UU/L and U/E in that we improved the address list and identified areas deemed unsuitable for mail delivery.

In UU/L, we verified 81.9% of the address list and updated 18.1%. We added 13,131 addresses, a 4.9% increase to the UU/L address registers. In U/E, we verified 61.9% of the address list and updated 37.2%. We added 129,692 addresses, a 12.5% increase to the U/E address registers.

Not all UU/L blocks had housing units. There were 5,186 UU/L blocks, 40.4%, with no housing units in the census. The high percentage of blocks with no housing units indicates that many blocks did not have the high housing unit densities expected for UU/L areas. In U/E, there were 108,062 blocks, 58.8%, with no housing units in the census.

We examined targeting of areas deemed unsuitable for mail delivery by looking at the DSF match rate, number of multi-units, and for UU/L the number of drop delivery addresses. We found a DSF match rate of 86.6% and 27.8% for the UU/L and U/E housing units in the census,

respectively. There was a higher percent of multi-units in UU/L areas, 42.8%, than in U/E areas, 13.3%. Less than 1% of UU/L addresses were drop delivery. While these addresses should be included in UU/L, they do not make up a large part of the UU/L housing units in the census. Furthermore, the variable used to identify drop delivery status is not robust.

In terms of hard-to-count classes, we identified about one-quarter of the UU/L addresses, 24.3%, in the hardest class and nearly half of the addresses, 47.1%, in the top three classes. Additionally, about one-quarter of the addresses, 24.6%, were in the three easiest classes. We should use the Planning Database in the future to help target hard-to-count areas deemed suitable for UU/L. We did not target U/E by trying to identify hard-to-enumerate areas. So we are not surprised that U/E addresses were in a wide range of hard-to-count classes.

In UU/L, 45.2% of housing units required contact in Nonresponse Follow-up and 16.2% in Coverage Improvement Followup. The UU/L vacancy rate, 14.9%, was higher than the national rate, 9.0%. Maybe some UU/L areas should have been designated as U/E areas to save additional visits to the housing unit.

The U/E vacancy rate, as expected, was higher than the national rate, 38.7% vs. 9.0%, respectively. U/E targeted areas with high vacancy rates. Overall, 41.6% of returns were proxies. The high proxy rate is probably due to the high vacancy rate in U/E areas.

The ability to successfully target the areas designated for UU/L and U/E was mixed. While the UU/L operation did include some areas that the operation was intended for, it included many areas where the operation was not intended – blocks without housing units; areas with higher than average vacancy rates, high DSF match rates, and few post office box or drop delivery housing units. In U/E, we targeted areas where we had concerns about mail delivery: selected American Indian reservations, colonias, and seasonal vacant housing units. One indicator of successful targeting for U/E was the high rate of incomplete or no address information for the U/E addresses, 18.4%. The low DSF match rate—27.8%, interviews conducted in Spanish, and the higher than average vacancy rate also indicated successful targeting.

For both UU/L and U/E there could have been places where the special enumeration methods should have been used and was not. In the future, we recommend areas be designated for special enumeration based on headquarters' objective requirements supplemented by regional input instead of the current practice of the regions designating areas subjectively.

Table 1. Address verification and updates during questionnaire delivery for addresses printed in the UU/L address registers

Action code during UU/L	#	%
Total housing units	267,005	100.0
Verification (acceptable)	218,772	81.9
Update	48,233	18.1
Correction	7,371	2.8
Block move	1,851	0.7
Nonexistent	35,376	13.2
Nonresidential	3,635	1.4

Data sources: March 2001 MAF extract and DMAF;

Table 2. Address verification and updates during field enumeration for addresses printed in the U/E address registers

Action code during U/E	#	%
Total housing units	926,861	100.0
Undetermined	8,074	0.9
Verification (acceptable)	573,699	61.9
Update	345,088	37.2
Correction	284,127	30.7
Block move	25	0.0
Nonexistent	49,294	5.3
Nonresidential	11,642	1.3

Data source: March 2001 MAF extract

Table 3. Type of address for UU/L and U/E housing units in the census

Address type	UU/L		U/E	
	#	%	#	%
Total housing units	238,216	100.0	956,214	100.0
Complete city-style	236,090	99.1	647,164	67.7
With location	871	0.4	124,336	13.0
Without location	235,219	98.7	522,828	54.7
Complete rural route	6	0.0	54,657	5.7
With location	6	0.0	53,464	5.6
Without location	0	0.0	1,193	0.1
Complete post office box	23	0.0	78,602	8.2
With location	23	0.0	75,088	7.9
Without location	0	0.0	3,514	0.4
Incomplete address	1,960	0.8	30,496	3.2
With location	1,352	0.6	19,816	2.1
Without location	608	0.3	10,680	1.1
No address	137	0.1	145,295	15.2
With location	120	0.1	142,168	14.9
Without location	17	0.0	3,127	0.3

Data source: March 2001 MAF extract

Table 4. Size of basic street address for UU/L and U/E housing units in the census by DSF match

Number of housing units at the basic street address	UU/L total	% of UU/L total	% of subcategory	U/E total	% of U/E total	% of subcategory
Total housing units	238,216	100.0	NA	956,214	100.0	NA
DSF match	206,228	86.6	NA	265,816	27.8	NA
Not DSF match	31,988	13.4	NA	690,398	72.2	NA
Single unit	136,333	57.2	100.0	828,848	86.7	100.0
DSF match	118,947	49.9	87.2	219,535	23.0	26.5
Not DSF match	17,386	7.3	12.8	609,313	63.7	73.5
Multi unit	101,883	42.8	100.0	127,366	13.3	100.0
DSF match	87,281	36.6	85.7	46,281	4.8	36.3
Not DSF match	14,602	6.1	14.3	81,085	8.5	63.7

Data source: March 2001 MAF extract; NA-not applicable

Table 5. Hard-to-count classes for UU/L and U/E housing units in the census

Hard-to-count class		# UU/L	% UU/L	UU/L Cumulative %	# U/E	% U/E	U/E Cumulative %
Total housing units		189,045	100.0		566,399	100.0	
hardest-to-count	1	45,877	24.3	24.3	42,398	7.5	7.5
	2	28,237	14.9	39.2	55,632	9.8	17.3
	3	14,913	7.9	47.1	40,727	7.2	24.5
	4	14,991	7.9	55.0	55,552	9.8	34.3
	5	12,874	6.8	61.8	82,327	14.5	48.8
	6	7,627	4.0	65.9	143,528	25.3	74.2
	7	17,952	9.5	75.4	117,947	20.8	95.0
	8	20,816	11.0	86.4	24,826	4.4	99.4
	9	17,203	9.1	95.5	1,411	0.2	99.6
easiest-to-count	10	8,555	4.5	100.0	2,051	0.4	100.0

Data sources: March 2001 MAF extract and Planning Database

Data source: HCEF_D'

Table 6. Nonresponse Followup and Coverage Improvement Followup status in UU/L areas

Status	Nonresponse Followup		Coverage Improvement Followup	
	#	%	#	%
Total housing units	280,086	100.0	280,086	100.0
In operation	249,954	89.2	274,171	97.9
Required contact	126,677	45.2	45,391	16.2
In census	106,015	37.9	22,505	8.0
Not in census	20,662	7.4	22,886	8.2
Did not require contact	123,277	44.0	228,780	81.7
In census	122,095	43.6	212,967	76.0
Not in census	1,182	0.4	15,813	5.6
Not in operation	30,132	10.8	5,915	2.1

Data source: Hundred Percent Census Edited File with reinstated cases (HCEF_D')

Table 7. Occupancy status for UU/L and U/E

Occupancy status	UU/L		U/E	
	#	%	#	%
Total housing units	238,216	100.0	956,214	100.0
Vacant	35,467	14.9	370,221	38.7
Occupied	202,749	85.1	585,993	61.3

Table 8. Proxy interviews

	U/E returns	
	#	%
Total returns	1,056,046	100.0
Household member	531,374	50.3
Proxy	439,572	41.6
In mover	5,088	0.5
Neighbor	434,484	41.1
Information not collected	85,100	8.1

Data source: DRF2

Table 9. Interviews conducted in Spanish

	U/E returns	
	#	%
Total returns	1,056,046	100.0
Spanish interview	36,934	3.5
Not Spanish interview	1,019,112	96.5

Data source: DRF2