

## The Development of the Address List in Update/Leave Areas for Census 2000

Megan Ruhnke, Karen Owens, Robin A. Pennington  
U. S. Census Bureau, Washington D.C., 20233

**Key words:** Master Address File; Address Listing; LUCA; Update/Leave; Census 2000

### I. INTRODUCTION

During Census 2000, the Census Bureau used a delivery method called Update/Leave in rural areas of the country where it believed that problems were likely with developing an accurate mailing list and delivering census questionnaires through the mail since many housing units (HUs) in these areas lacked mailing addresses that could identify their geographic location. The Census Bureau created the initial address list for these areas in an operation called Address Listing. In this operation, field staff listed all addresses in Update/Leave areas and simultaneously added them to census maps with a location designation known as a map spot.

The Census Bureau then delivered block counts of addresses on the address lists to participating governmental units (GUs) in the 1999 Local Update of Census Addresses (LUCA 99). GUs had the opportunity to challenge our block counts. Field staff then recanvassed the challenged blocks and made updates to the address list. Field staff updated the address list during the census in an operation called Update/Leave, in which they hand-delivered pre-addressed census questionnaires. Field staff made updates to the address list and the maps concurrently. In this paper, we summarize the combined contribution of these three operations that took place in Update/Leave areas of the country. The universe of addresses in the Update/Leave operation consists of units added during address listing, as well as units added by during LUCA 99 Recanvass. However, the Update/Leave universe also had addresses that came from other operations not intended for these areas of the country: 38,734 units were sent to Update/Leave and were not added by either the Address Listing or LUCA 99 operations. The LUCA 99 Recanvass universe also contained some addresses that came from other operations not intended for Update/Leave areas: 5,170 units in the LUCA 99 universe were not added in the Address Listing operation. More research needs to be done to find out where those addresses came from.

### II. ADDRESS LISTING

Field staff conducted the Address Listing operation from

July 1998 to May 1999, and the Census Bureau used its results to create the initial Master Address File (MAF) for Update/Leave areas of Census 2000. In the Address Listing operation, census enumerators canvassed door-to-door to identify the mailing address and physical location of addresses in these areas. The enumerators also located each housing unit on a map with a map spot on a block map. Enumerators also provided a concise physical description of structures where it was not possible to determine a locatable city-style address and enumerators attempted to obtain an occupant name and telephone number when possible.

In Update/Leave areas of the country, approximately 22.4 million housing units were listed in Address Listing, including Puerto Rico. Since the Address Listing operation targeted mostly rural areas of the country, the majority of the adds from the operation were in the southern and midwestern parts of the U.S. The South had close to half of all the address listing adds, as can be seen in Table 1 below.

**Table 1. Address Listing Adds by Census Region**

Census Region	Count	Percent
Northeast	2,828,115	12.64
Midwest	4,436,235	19.82
South	11,076,492	49.49
West	2,685,770	12.00
Puerto Rico	1,353,562	6.05
<b>Total</b>	<b>22,380,174</b>	<b>100.00</b>

Addresses added in the Address Listing operation were eligible for inclusion in the LUCA 99 and Update/Leave operations. Since these addresses would be later visited by field staff, each unit needed to have "locatable" address information so that field representatives could find the address on the ground. The type of address information collected during the Address Listing operation is shown below in Table 2.

**Table 2. Address Listing Adds by Type of Address**

Type of Address	Count	Percent
Complete City-style	15,473,658	69.14
Complete Non-City-Style	3,026,774	13.53
Incomplete address	233,391	1.04
No address	3,646,351	16.29
<b>Total</b>	<b>22,380,174</b>	<b>100.00</b>

The majority of Address Listing adds did have a “complete city-style” address type, which generally consists of a house number-street name type of address, like 101 Main Street. These types of addresses would presumably be easier for enumerators to find on the ground. Of the housing units listed, 69.14% had a complete city-style address and 13.53% had a complete non-city-style address (e.g. P.O. Box, Rural Route), while 16.29% had no address information, and only 1.04% had some sort of incomplete address information. Of the addresses with no or incomplete address information, enumerators recorded a physical location description over 96% of the time in order to help staff locate the unit during Update/Leave.

Addresses provided in the Address Listing operation also required a block code and a map spot, which allows an enumerator to locate and enumerate the address during the Update/Leave and subsequent followup operations. Of the approximately 22.4 million addresses listed in the operation, 99.81% have mapspots and 99.92% had a block code from the operation. Those addresses that did not have mapspots or block codes, and also many of the units with no address information or location description, were not likely to be sent to the Update/Leave operation for enumeration in the census.

### III. LUCA 1999

The Census 2000 LUCA operation invited local and tribal governmental units to review address lists and housing unit counts by block prior to Census day and provide any updates to the Census Bureau. There were two types of LUCA programs. One was for governmental units in the United States and Puerto Rico that had at least some area in which the Census Bureau planned to use Update/Leave enumeration methods (LUCA 99) and one was for governmental units with Mailout/Mailback enumeration areas (LUCA 98). The Census Bureau conducted LUCA 99 from June of 1999 to March of 2000. Governments that participated were to review the counts of housing units in blocks and challenge block counts they believed to be incorrect. The Census Bureau sent challenged blocks to a special LUCA 99 Recanvass operation. Participating

governments received results from LUCA 99 Recanvass and then had the opportunity to appeal further discrepancies.

A total of 30,375 governments were eligible to participate in the Census 2000 LUCA 99 program. Of those eligible, about 40 percent, or 10,925 GUs, participated in the program. These governments signed a confidentiality agreement with the Census Bureau, and did not dropout or become disincorporated at any time during the program. Approximately 48 percent of the participating governments challenged a total of 117,073 blocks.

There were 2,150,874 addresses in these 117,073 blocks sent to the LUCA 99 Recanvass operation in Update/Leave areas. Field representatives canvassed those blocks and verified, corrected or deleted units on their lists. The results of the Recanvass operation for addresses sent out are provided below in Table 3.

**Table 3. Results of LUCA 99 Recanvass**

Action	Count	Percent
Verifications	1,639,309	76.22
Deletes and Nonresidentials	138,959	6.46
Corrections	372,606	17.32
<b>Total sent to Recanvass</b>	<b>2,150,874</b>	<b>100.00</b>

In addition to the verifications, deletes and corrections listed above, field representatives added 319,916 new addresses to the MAF.

Since governmental units across the country participated in the program and challenged blocks, the Census Bureau conducted LUCA 99 Recanvass in all regions of the U.S. and Puerto Rico. The majority of the adds from the operation were in the southern and western parts of the U.S.

**Table 4. LUCA 99 Recanvass Adds by Census Region**

Region	Count	Percent
West	84,168	26.31
Midwest	46,392	14.50
Northeast	28,726	8.98
South	150,756	47.12
Puerto Rico	9,874	3.09
<b>Total</b>	<b>319,916</b>	<b>100.00</b>

The South, which has the largest proportion of Update/Leave type areas, had the largest percentage of LUCA 99 Recanvass adds (47.1%). The northeastern part of the U.S. had the fewest, however this is not surprising since this region also had a small number of eligible and participating governmental units.

Addresses added in the LUCA 99 operation were eligible for inclusion in the Update/Leave operation. Added addresses needed to be locatable so that Update/Leave field representatives could find the address on the ground. The majority of LUCA adds had a “complete city-style” address type which would make location easier.

**Table 5. LUCA 99 Recanvass Adds by Type of Address**

Type of Address	Count	Percent
Complete City-style	249,168	77.89
Complete Non-city-style	14,902	4.59
Incomplete address	3,820	1.19
No address	52,026	16.26
<b>Total</b>	<b>319,916</b>	<b>100.00</b>

About 77.9 percent of the adds had city-style address information provided. Most of the remaining adds did not have any address information at all. These were not likely to be eligible for the Update/Leave operation unless LUCA provided some type of location description, which it did for over 98 percent of the units without any address information.

#### IV. UPDATE/LEAVE

The enumeration in Update/Leave consisted of a dependent listing of the addresses in Update/Leave areas of the country in conjunction with the distribution of a questionnaire at each housing unit. The operation started in late March of 2000 and continued through the middle of April.

This 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.

Update/Leave enumerators were to correct, delete, verify or add housing units on the lists and maps during the operation. Results of the operation are presented below in Table 6.

**Table 6. Results of Update/Leave**

Action	Count	Percent
Verifications	11,932,216	51.65
Deletes and Nonresidentials	1,351,802	5.85
Corrections and Moves	9,821,235	42.50
<b>Total</b>	<b>23,105,253</b>	<b>100.00</b>

Update/Leave enumerators verified over 11.9 million housing units. In addition to the verifications, deletes and corrections, they added over 1.7 million housing units to the address list.

**Table 7. Update/Leave Adds by Census Region**

Region	Count	Percent
West	275,865	15.71
Midwest	266,544	15.18
Northeast	171,769	9.78
South	929,996	52.96
Puerto Rico	111,787	6.37
<b>Total</b>	<b>1,755,961</b>	<b>100.00</b>

Over half of the housing units added in Update/Leave are in the southern region of the country, where most of the operation took place. The west and midwest areas of the country each had more than a quarter million adds.

In Table 8 below, we look at the types of address information collected on these adds.

**Table 8. Update/Leave Adds by Type of Address**

Type of Address	Count	Percent
Complete City-style	1,066,050	60.71
Complete Non-city-style	133,698	7.61
Incomplete address	56,410	3.21
No address	499,803	28.46
<b>Total</b>	<b>1,755,961</b>	<b>100.00</b>

While addresses added during the Update/Leave operation still had mostly complete city-style address information, they have the highest percentage of no address information of the three operations. However,

of the added units with no address information, about 98 percent of them had location descriptions, which is comparable to both Address Listing and LUCA 99.

## V. COMBINED RESULTS

Field staff added about 24.4 million unique addresses<sup>1</sup> in Update/Leave areas of the country during these three operations. The Address Listing operation added about 22.4 million of those addresses, and LUCA 99 Recanvass or Update/Leave picked up an additional 2 million units. Although these operations added units in other areas of the country, such as Rural Update/Enumerate areas, we are only reporting those addresses that fall within the defined Update/Leave areas.

**Table 9. Initial Adds per Operation for Update/Leave Areas**

Operation	Count	Percent
Address Listing	22,380,174	91.74
LUCA 1999	319,587	1.31
Update/Leave	1,694,131	6.95
<b>Total</b>	<b>24,393,892</b>	<b>100.00</b>

Of the 22,380,174 Address Listing adds, 2,149,304 (9.6%) were in LUCA 99 challenged blocks.

<sup>1</sup> The count of LUCA 1999 adds does not include the 399 adds that were previously added by Address Listing or the 526 adds that were in the LUCA 99 universe, not added by Address Listing, and "added again" in LUCA 99 Recanvass. Additionally, the count of Update/Leave adds does not include the 51,565 that were also added by Address Listing, the 950 that were also added by LUCA 99, or the one address that was added by previously by both Address Listing and LUCA 99. It also does not include the 6,275 units in the U/L universe, not added by a previous operation, and "added again" in Update/Leave.

**Table 10. The status of Address Listing Adds in the LUCA 99 and Update/Leave Universes**

Operation	In LUCA 99 universe		NOT in LUCA 99 universe	
	Count	%	Count	%
In U/L universe	2,015,514	93.78	20,171,239	99.71
NOT in U/L universe	133,790	6.22	59,631	0.29
<b>Totals</b>	<b>2,149,304</b>	<b>100.00</b>	<b>20,230,870</b>	<b>100.00</b>

By looking at the table above, we can find that the total number of Address Listing adds that did not go to Update/Leave is 193,421 addresses. These addresses were therefore not delivered census questionnaires during the Update/Leave operation. One reason for this could be that they were lacking the information needed for enumerators to locate the address on the ground. The types of missing information could have included mapspots, block codes, or some type of address or physical location description.

As can be seen, there is a considerably higher rate of Address Listing adds that did not go into the Update/Leave universe in areas where local governments challenged blocks in LUCA 1999.

Over 99 percent of the Address Listing adds that were in LUCA 99 challenged blocks but that did not go to Update/Leave (113,336 units) were deleted in LUCA 99 Recanvass. However, not all units deleted in LUCA 99 were left out of the Update/Leave operation. More research needs to be done to determine the criteria for units being left out of the Update/Leave operation.

**Table 11. LUCA 99 Recanvass Actions on Units Added in the Address Listing Operation**

Action	Count	Percent
Verifications	1,638,065	76.22
Deletes and Nonresidentials	138,700	6.45
Corrections	372,469	17.33
Adds	70	<0.01
<b>Total</b>	<b>2,149,304</b>	<b>100.00</b>

Field staff verified about 76 percent of the Address Listing adds that were in LUCA 99 challenged blocks were verified during the LUCA 99 Recanvass operation, and they corrected about 17 percent. Field staff deleted or determined to be non-residential about 7 percent of the addresses. There were 70 units that were added in Address Listing, were in the LUCA 99 Recanvass

universe, and were added again in the LUCA 99 Recanvass operation. A total of 319,587 units were added to the MAF as a result of LUCA 99 Recanvass. More than 99 percent of those adds went into the Update/Leave universe. Table 12 below presents the results of what was done with those LUCA 99 Recanvass adds in Update/Leave.

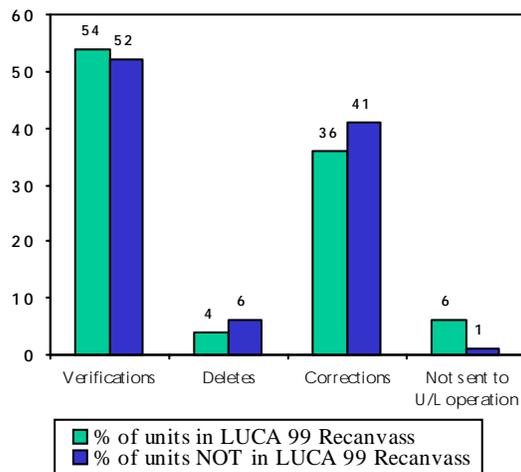
**Table 12. Update/Leave Actions on Units Added in the LUCA 1999 Recanvass Operation**

Action	Count	Percent
Verifications	147,078	46.02
Deletes and Nonresidential	48,628	15.22
Corrections and Moves	120,302	37.64
Adds	941	0.29
LUCA Adds NOT in Update/Leave universe	2,638	0.83
<b>Total</b>	<b>319,587</b>	<b>100.00</b>

The majority of the housing units added in LUCA 99 Recanvass were in the universe for Update/Leave. Update/Leave field representatives verified the existence of 46 percent of LUCA adds. However, field staff deleted, corrected, or moved the majority of those adds (52.9 %) in the Update/Leave operation, indicating LUCA added a significant number of units that were nonresidential or that did not exist in the block that they were determined to be in during the LUCA 99 Recanvass operation.

Since the purpose of the LUCA 99 Recanvass operation was to help fix and update blocks before the Update/Leave operation happened in the field, it is interesting to compare what ultimately happened to Address Listing adds in areas where LUCA 99 Recanvass did occur versus those areas where it did not. The table below presents the results of Update/Leave actions for Address Listing adds.

**Table 13. Update/Leave Actions for Units Added in the Address Listing Operation**



This table shows that there were higher rates of deletes, corrections and moves in areas where LUCA 99 Recanvass was not done. There is also a considerably higher rate of Address Listing adds left out of the Update/Leave universe in areas where LUCA was done. These two things suggest that LUCA was somewhat successful in cleaning up some of the things that did not belong in the challenged blocks. Of the 133,790 Address Listing adds in LUCA 99 areas that did not go to Update/Leave, LUCA 99 deleted 99.66 percent of them.

Of the 193,421 Address Listing adds not sent to Update/Leave, 317 of them were actually added again in the Update/Leave operation. This means that those units were most likely erroneously left out of the universe. A total of 51,249 units added in Address Listing and in the Update/Leave universe also got added again during the Update/Leave operation. It is likely that these units were added in a different block and then later merged on the MAF. It could also suggest a problem with enumerators adding addresses already on their lists.

## VI. CONCLUSIONS

The Address Listing, LUCA 99 Recanvass, and Update/Leave operations were the three operations that occurred to build the address list for Update/Leave areas during Census 2000. Combined, these three operations were successful in adding **24,393,892** unique addresses, where over 90 percent of those units came from the Address Listing operation. About half of those units added in these three operations were in the southern

parts of the United States. About 65 percent of the units had locatable city-style address information, despite being in mostly rural areas. That type of address information is helpful for census enumerators trying to locate the units in the field.

About 10 percent of the units listed in the Address Listing operation existed in the LUCA 99 Recanvass blocks. During LUCA 99 Recanvass, field staff verified over 76 percent of the Address Listing units in the challenged blocks during LUCA 99 Recanvass. During the Update/Leave operation, field verified a little more than half of the units, and made corrections to about 40 percent of the units. Most units added during the Address Listing operation had questionnaires delivered to them during the Update/Leave operation. Less than one percent of them did not.