Scan/US, Inc. Update Methodology

Scan/US, Inc. generates demographic updates for the current year and a five year projection for all US Census geographies, for Scan/US's proprietary 5-digit ZIP boundaries, for our trademark MicroGrids and for US Postal Service (USPS) Carrier Route centroids. Collecting input and control data is a continual process. Starting in 2010 Scan/US, Inc. is releasing Demographic Updates twice a year in order to provide the most accurate and timely data for your location-based decisions.

The following discussion of Scan/US, Inc's demographic updates and cartography updates will present the case as to why Scan/US, Inc. is the leader in providing decision makers actionable data for their location-based decisions.

Getting the Demographic Controls Right

Scan/US, Inc. uses a number of government data series released at the US, State and County level to guide the demographic estimates and projections for all US counties. The Census Bureau publishes the Current Population Survey (CPS) annually; the most current data point in the CPS is 12 to 18 months prior to the publication date of the CPS. These series include basic counts: population, housing units and group quarters population, as well as detailed cross-tabulations of population by age, sex, race and Hispanic origin. The Bureau of Labor Statistics (BLS) provides the annual county-level Labor Force Status series as well as current quarterly unemployment reports. The Bureau of Economic Analysis produces a county series on personal income.

In addition to these important traditional control series, the Census Bureau implemented the American Community Survey (ACS) program in 2005. The ACS program has replaced the Census Long Form, which was distributed to a 7% sample of US households as a part of every census until the 2010 Census. The ACS three-year pooled survey now provides a reliable detailed socioeconomic profile for counties with populations of 20,000 or more. The 2009 ACS 5 year pooled survey, to be published in late 2010, will cover all states, counties, county subdivisions, places and Census Tracts regardless of population size. Early in 2011, the 2005-2009 ACS Summary Files down to the block group will be released.

Scan/US, Inc. integrated the ACS single year annual release data into its update process starting in 2007 with the ACS 2005 survey results. We used the results of the ACS 2008 three-year survey in our 2010 update process, and we look forward to incorporating the 2009 five-year survey results along with the first-available 2010 Census data for reapportionment, in the 2011 demographic updates.

Using current USPS active residential delivery counts as county controls.

The US Postal Service releases monthly delivery counts for all postal carrier routes in the United States. These residential and business delivery counts provide a current measure of households and businesses receiving mail across all 242,000 carrier routes in the United States. Carrier Route delivery statistics, summarized to the county level, provide a household data point for the estimate year. Thus Scan/US can identify counties experiencing rapid change which are not reflected in the CPS series due to its 12 to 18 month lag behind its publication date.

Modeling household income change

The Census Bureau publishes an annual series of detailed household income tables for the United States from which Scan/US, Inc. generates an income category shift model for moving base year income distributions forward over time. The ACS county level income profiles by household type are used to correct the estimates for structural changes in local demographics.

Moving from the county view of the Unites States to the ground truth

Getting it right at the county level is only part of the battle. The real challenge is to map that change onto the landscape at a geographic resolution that supports location-based decisions down to local neighborhoods. This requires being able to track household change down to the level of a few city blocks—city blocks that were not even defined in Census 2000. Scan/US, Inc. over the last two decades has developed and refined a proprietary cartography called Scan/US MicroGrids that reflect change down to $1/16^{th}$ of a square mile. The MicroGrid cartography is a network of cells of three sizes: large ≈ 1 square mile, medium ≈ ¼ sq. mile, and small ≈ $1/16^{th}$ sq. mile. MicroGrids exist where there is either housing or business development on the landscape, and grid size is determined by the density of that development. The smaller the grid, the denser the development contained by the grid.

The MicroGrid cartography is updated annually. The key ingredients in this process are a current national mailing list of deliverable residential and business addresses summarized to ZIP+4s, and latitude/longitude coordinates for each ZIP+4. The 40 million or so ZIP+4s, with their current residential and business deliveries, are poured into the existing MicroGrid network, resulting in the addition of grids in new developing areas, or the subdivision of larger grids to better define the housing distribution in growing neighborhoods. The end results are a MicroGrid cartography that represents the current distribution of households and businesses throughout the United States down to $1/6^{th}$ of a square mile.

Updating the Demographic Profile at the Neighborhood Level

The current ZIP+4 residential counts are summarized to block groups within counties, and are used to calculate the participation rate of the block groups in the distribution of the county demographic estimates and projections. The base demographic profiles of the block groups are normalized to their new delivery count population and household estimates, and then the block groups within the county are balanced across all demographic dimensions to the county estimates. The block group's detailed demographic

profile then gets distributed to their blocks by normalizing the blocks' base demographics to their new household and population controls and balancing each demographic dimension to the block group controls. The resulting block estimates are then used to build the demographic profiles of the MicroGrids through a block-to-MicroGrid cross reference which has household weights based on the ZIP+4 assignments.

All of this works fine if you are dealing with a block group that has a solid base demographic profile to build on. However, when dealing with block groups which had few or no households in the base year, but which are estimated to have gained a significant number of households over the ensuing years, some creativity is required. Under these circumstances, we recruit the most likely demographic profile from an adjacent block group in order to imbue the new households with the demographic profile of the neighborhood.

The MicroGrid Advantage

The MicroGrid cartography has improved the resolution of its view of the United States over the last decade. When the 2000 Census sample data were released in 2002, only 210,000 block Groups covered the United States. The block group is the lowest level of Census geography at which the Census Bureau releases a Population and Housing detailed demographic profile. In 2002, the Scan/US MicroGrid cartography had 1.2 million grids covering the U.S. The Scan/US MicroGrids provided a view of small area Census demographics at 5 times the resolution of the block groups. This view, in addition to being finer grained, also provides greater clarity because the grids only exist where there is housing and business activity.

Now we await the release of the ACS 2009 5 year pooled survey that, for the first time in almost a decade, will provide a more current survey-based detailed demographic profile for the 2000 block group cartography. While the census block groups have remained static during the last 8 years, the Scan/US MicroGrid cartography has continued to improve its focus and now contains 2.55 million grids, a resolution that is 12 times that of the block group cartography.

# Appendix: Tracking Residential Growth With MicroGrids

Scan/US MicroGrids™ are better at showing population change than either Census Block Groups, or Census Blocks.

This three-section appendix shows you how MicroGrids are better. First we present an overview, and then, in a more detailed look, we compare the MicroGrid view of households on the ground , compared with the BG/Block depiction. Finally we discuss one grid in detail.

1. The Study Area

Our 'study area' is a four block-group area in Santa Clarita, CA. This area illustrates how Scan/US shows change with its proprietary MicroGrid geography.

As of 2000, US Census records 12 households in these four block groups. The Scan/US 2010 mid-year estimates show 2,835 households in residence, 90% of them new since 2005.
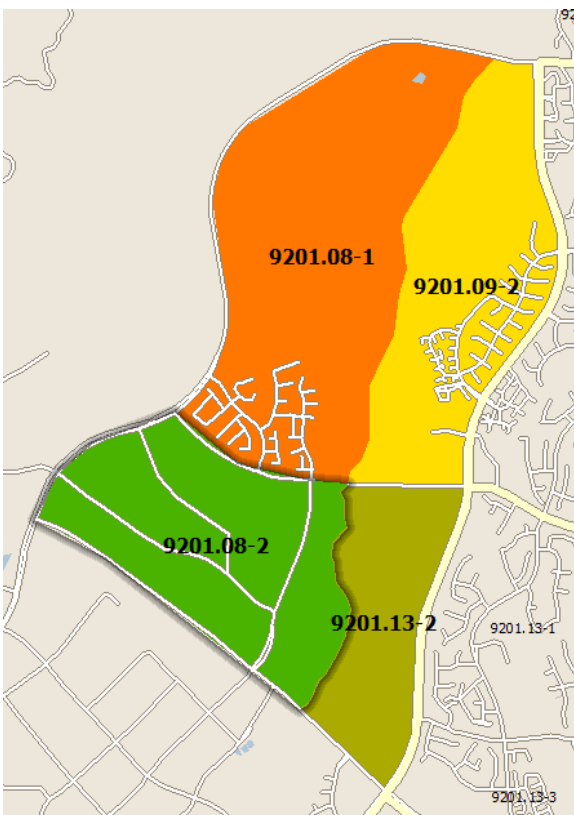
Four Census block-groups showing streets based on TIGER 2009 streets

A 2009 satellite image shows the extent of development that is revealed in the Scan/US 2010 estimates. (Google Earth photo)

This table summarizes the residential development in this 1.64 square mile area between 2000 and 2010.

Block group	2000 Census		2010 estimates	
	Household population	Households	Household population	Households
9201.08-1	0	0	2585	834
9201.09-2	37	12	2204	701
9210.08-2	0	0	1508	486
9201.13-2	0	0	2522	814
Total	37	12	8819	2835

2. Zooming in to the Neighborhood: MicroGrids and Zip+4s and their relation to data

Using Zip+4 segment points, Scan/US tracks the placement of residential change more accurately than Census block groups or Census blocks.

Zip+4 segments are the basic units of the postal delivery system. Scan/US MicroGrid cartography, summarizing data from Zip+4 segments, brings residential change into focus at the resolution of 1/16th of a square mile.

The study area contains 4 block groups, 12 blocks, 25 MicroGrids and 274 Zip+4 segments. Residential saturation data ("drop counts") for Zip+4s provide the data points for distributing block group estimates of household counts. How is this done?

First the drop counts of the blocks within a block group are normalized and used as weights to distribute the block group's updated demographics to the blocks. The resulting detailed demographics for the blocks are then rebalanced to conform to the parent block group's demographic profile. The distribution of the balanced block updates to the MicroGrids is accomplished by using the current Zip+4 drop counts to calculate the proportion of block demographics that are to be assigned to the overlapping grids.

The MicroGrid highlighted on the map derives all of its characteristics from one block but the MicroGrid overlay of the study area shows that, in many cases, multiple blocks and block groups contribute to a particular grid's demographic profile.
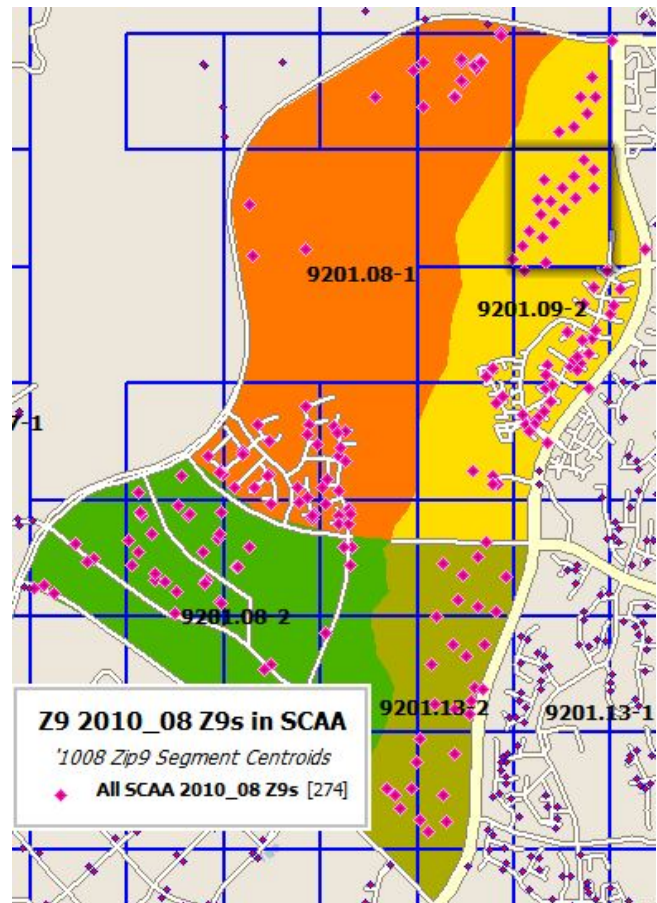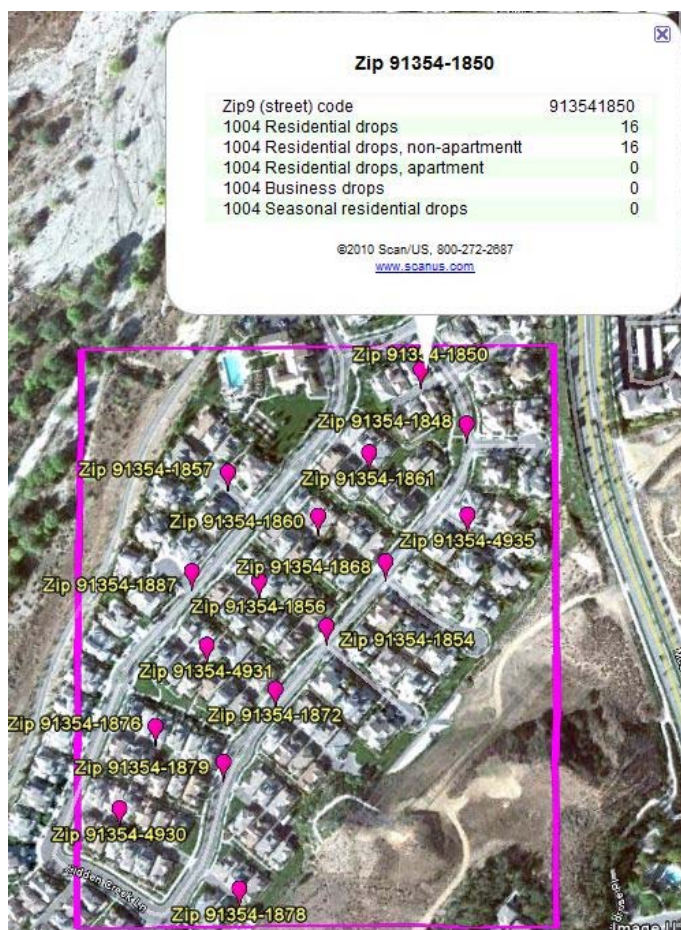

Scan/US MicroGrids (blue grid) and Zip+4 segments (purple diamonds) superimposed on Census 2000 block groups

3. Focus on MicroGrid 34118/2734.34
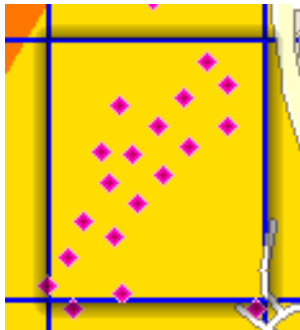
MicroGrid 34118/2734.34 from map on previous page, showing 16 Zip+4 segment locations

This grid contains the 16 Zip+4s listed below, along with their April 2010 "Drop Counts".

The Zip+4 drop counts indicate where, how much and what type of development exists right down to a specific address range on a street.

The table below shows the four separate counts that are available for each Zip+4: single family (Napt), multi-family (Apt), business (Bus) and seasonal (Seas). These drop counts tell us that this MicroGrid neighborhood is made up of exclusively single family dwellings.

The satellite photo below shows the 16 Zip+4s overlaid by the grid. (The image was created using Scan/US "Locate in Google Earth," a standard feature of the Scan/US software).

ZIP+4 code	TotRes	Napt	Apt	Bus	Seas
91354-1848	8	8	0	0	0
91354-1850	16	16	0	0	0
91354-1854	18	18	0	0	0
91354-1856	6	6	0	0	0
91354-1857	11	11	0	0	0
91354-1860	6	6	0	0	0
91354=1861	6	6	0	0	0
91354-1868	18	18	0	0	0
91354-1872	14	14	0	0	0
91354-1876	6	6	0	0	0
91354-1878	11	11	0	0	0
91354-1879	13	13	0	0	0
91354-1887	8	8	0	0	0
91354-4930	6	6	0	0	0
91354-4931	6	6	0	0	0
91354-4935	17	17	0	0	0
Grid totals	170	170	0	0	0

The 16 Zip+4 markers on the image pinpoint the housing associated with the drop counts. The "TotRes" drop count approximates "total housing units" not "occupied housing units" or households. A cursory rooftop count of the housing seen in this satellite image of the grid comes to 120 housing units (as of the date of the image) compared to the "TotRes" counts of grid total of 170. The Scan/US 2010 balanced estimate of total housing units in the grid is 108 units.
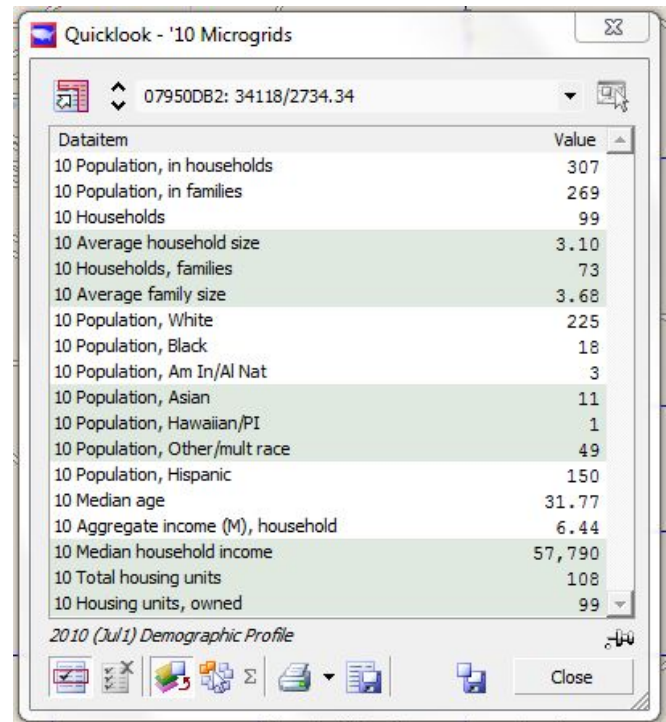
In conclusion: Scan/US Update Data

The Scan/US QuickLook for this MicroGrid displays about eighteen 2010 demographic variables selected from approximately 1000 values that are estimated and projected for every object on each geographic layer.

This grid is roughly 1/16th of a square mile in size and is estimated to contain 99 households with an average size of 3.10 persons; median household income is $57,790, and an annual aggregate household income of $6,440,000.

These numbers make this micro-neighborhood one that retailers would be glad to know is in their trade area. The neighborhood size of the MicroGrid and the demographic information it contains make it the ideal unit of geography for supporting small area location based decisions.

Scan/US updates the MicroGrid geography annually, adding new grids where Zip+4s have appeared for the first time. 196,117 grids were added this year to the 2010 MicroGrid cartography for a total of 2,552,006 MicroGrids covering the United States.

Quicklook - '10 Microgrids

07950DB2: 34118/2734.34

Dataitem	Value
10 Population, in households	307
10 Population, in families	269
10 Households	99
10 Average household size	3.10
10 Households, families	73
10 Average family size	3.68
10 Population, White	225
10 Population, Black	18
10 Population, Am In/Al Nat	3
10 Population, Asian	11
10 Population, Hawaiian/PI	1
10 Population, Other/mult race	49
10 Population, Hispanic	150
10 Median age	31.77
10 Aggregate income (M), household	6.44
10 Median household income	57,790
10 Total housing units	108
10 Housing units, owned	99

2010 (Jul1) Demographic Profile

Close