


# MicroBuild<sup>®</sup> On Location Vineyard, UT

A Geospatial Data Study: High-Change Growth

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# Introduction

Using MicroBuild on Location, Gadberry Group's Geospatial Data Study identifies and spotlights high-change areas across the country. With over 500 cities that have experienced dramatic change since the 2010 Census, many are moving undetected through sales and proforma pipelines. MicroBuild On Location demonstrates how companies use MicroBuild to increase the usable value of their advanced geospatial applications.

The Geospatial Data Studies will demonstrate three distinct change aware scenarios:

High-Change Growth	Consumer household changes due to new development on repurposed industrial or commercial brownfield locations and greenfield development.
Shifting Demographics	Consumer household changes due to shifting household demographics in areas of stabilized household counts and living quarters.
New Construction	Consumer household changes due to urban renewal, urban revitalization and gentrification.

This High-Change Growth Geospatial Data Study details the significant impact micro-level geospatial and location intelligence datasets have for commercial and residential development applications in an area of High-Change Growth. The study location is Vineyard, UT.

# Location Background: Vineyard, UT

Vineyard, Utah, an area just outside of Provo, was once a sleepy little area made up of farmland and a shuttered steel mill. According to the U.S. Census, Vineyard has grown from 611 residents to almost 4,000 in 2016. But those estimates fall woefully short of what is happening on the ground in Vineyard.

In the Utah Valley, where the growing high-tech community is creating one of the highest job-growth areas in the nation, land for new development is scarce. With mountains all around and Utah Lake to the west, Geneva Steel Mill's industrial site's 1,600 acres has become the catalyst for commercial and residential development.

- Repurposed Geneva Steel Mill site is the catalyst for high-change growth
- Commissioned in 1941 on 1,600 acres west of Orem, UT
- Became one of the nation's largest steel production centers
- Operations ceased in 2002; sold and dismantled in 2005
- Multi-purpose Master Plan in 2014
- Initial growth began in nearby agrarian land before moving into repurposed industrial brownfield land



The area became central to a multi-purpose Master Plan in 2014, and is expected to help Vineyard grow to 40,000 residents in the coming years. When development is complete, Vineyard expects to have 3 million square feet of office space, 2 million square feet of retail space and 5.5 million square feet of industrial space.

Satellite imagery shows significant high-growth change since 2012:



Population increases in places like Vineyard drive the need for services and commercial storefronts. Services, such as housing, transportation, utilities, education and health care are needed for these new inhabitants. Banks, retail and restaurants are also needed for the growing community. Not only is Vineyard growing, but it is also bringing a younger and more diverse consumer to the area. The need for businesses to better assess, respond and serve these residents is a challenge.

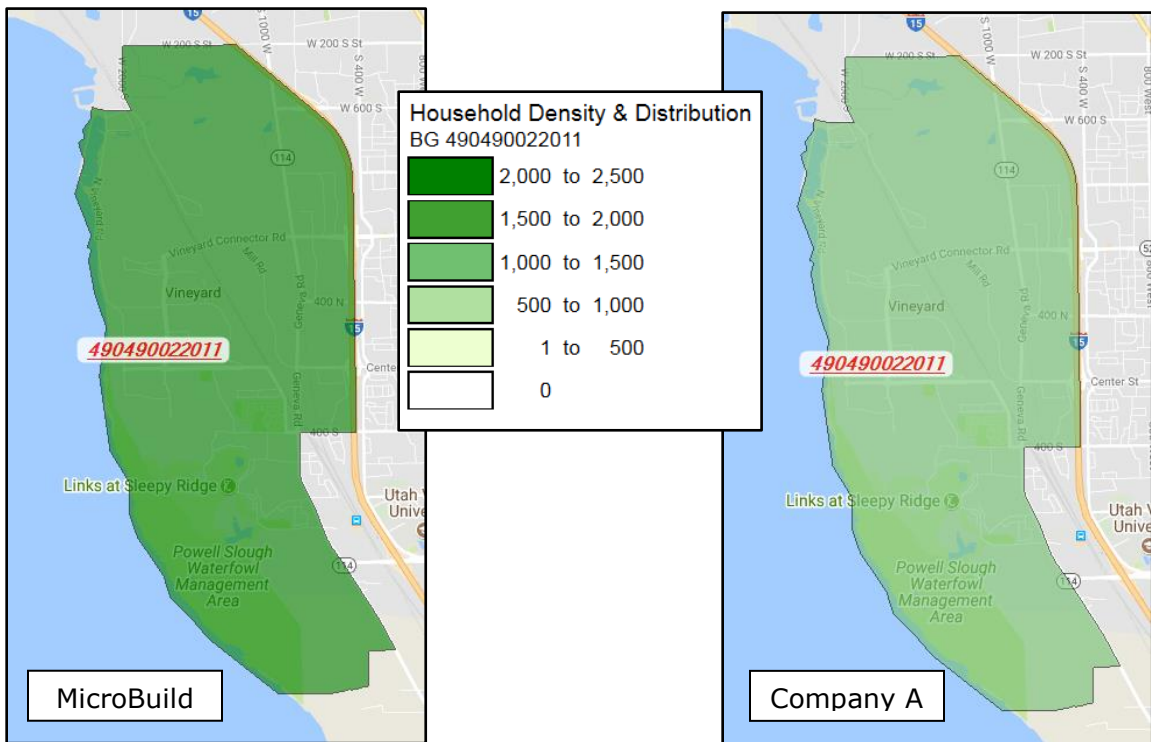
# Block Group Assessment

## Data Study

- Geography: Block Group 490490022011
- Study Attribute: Household Density and Distribution (Household Counts)
- Focus – Compare MicroBuild, a micro-level dataset that annually measures consumer households, with Company A, a major geospatial and location intelligence company that uses Census estimates and projections.
  - MicroBuild<sup>1</sup> (2016)
  - Company A<sup>2</sup> (2016)

## Findings

MicroBuild indicates that there are almost twice as many (1,040, 88.6%) households in Block Group 490490022011 than is indicated by Company A.



	MicroBuild	Company A	Difference
2016 Households	2,214	1,174	1,040/88.6%

<sup>1</sup> Gadberry Group MicroBuild Vintage 55

<sup>2</sup> Major geospatial and location intelligence data and application provider

## Assessment

MicroBuild is able to recognize and capture high-change household growth because it annually measures consumer households, aggregating first at Census Block and then at Block Group and higher geographies. MicroBuild household counts have increased significantly since 2015 for this Block Group because it measures consumer households each year.

	2010	2015	2016	2017 <sup>3</sup>
Households	479	1,317	2,214	2,992

Company A does not aggregate households based on the measurement of consumer households and is therefore not able to identify and report high-change household growth. Companies that use estimates and projections based on the 2010 Census and random/periodic ACS survey sampling are not designed to keep up with the significant changes that are occurring in Vineyard.

Identifying the correct numbers of households in each geography is crucial to the precision and accuracy of geospatial and location intelligence analysis. Total population numbers, average household size and attributes such as average/median income, age, ethnicity and segmentation are dependent on correctly identifying and aggregating households.

Geospatial data sets are only as accurate as the smallest geography that they interrogate. Those data sets that use household counts derived from higher geographies such as Census Block Group project that level of interrogation across the entire geography – projecting those higher-geography counts down to smaller geographies loses the ability to differentiate attributes at those smaller geographies.

Because MicroBuild measures the most fundamental geospatial attribute unit, the consumer household, and then aggregates the resulting counts to micro-level geographies of Census Block (and higher), MicroBuild's dataset delivers a level of precision and accuracy that is superior to any other methodology.

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<sup>3</sup> Release v59, Spring 2018

# Block Level Assessment

## Household Density and Distribution

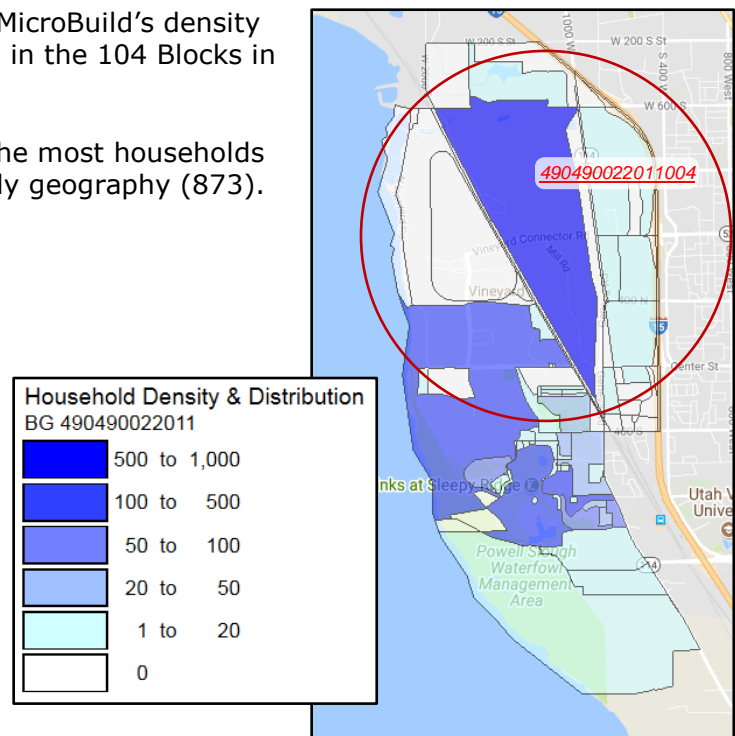
### Data Study

- Geography
  - Block Group 490490022011
  - Block 490490022011004
- Study Attribute: Household Density and Distribution (Household Counts)
- Focus: Compare the density and distribution of consumer households at Census Block-level for all 104 Census Blocks in Block Group 490490022011, using MicroBuild's consumer household measurement and aggregation methodology.

### Findings

The map image demonstrates MicroBuild's density and distribution for households in the 104 Blocks in the study area.

Block 490490022011004 has the most households of any of the Blocks in the study geography (873).



### Assessment

MicroBuild identifies 873 households in Block 1004 because it annually measures consumer households and aggregates the results to Census Blocks. Except for 2010 Census counts (PL-94: 7 households in Block 1004), comparing MicroBuild to other geospatial datasets is not relevant as they apportion Census Block Group household estimates and projections across the 104 Census Blocks, losing the ability to discriminate at the Block-level.



# Average Household Income

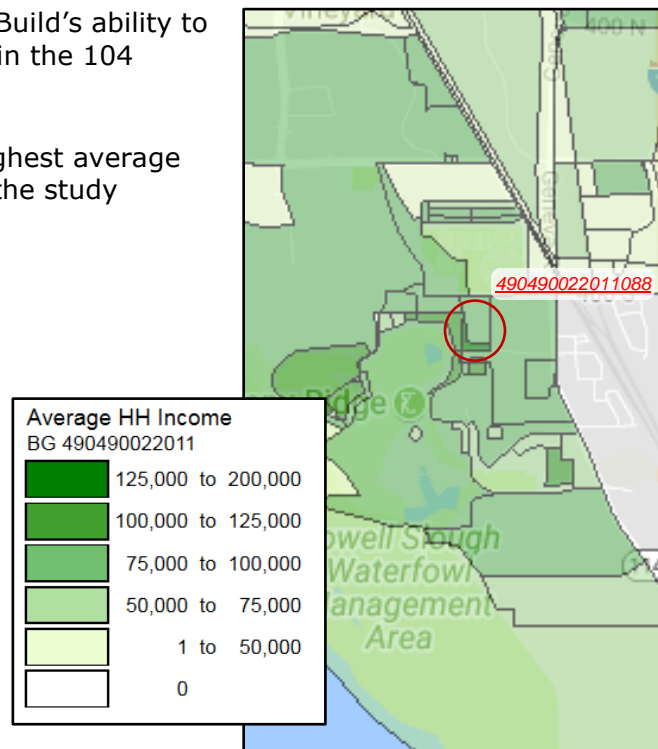
## Data Study

- Geography
  - Block Group 490490022011
  - Block 490490022011088
- Study Attribute: Average Household Income
- Focus: Compare the average household income at Census Block-level for all 104 Census Blocks in Block Group 490490022011, using MicroBuild's consumer household measurement and aggregation methodology.

## Findings

The map image demonstrates MicroBuild's ability to differentiate average house income in the 104 Blocks in the study area.

Block 490490022011088 has the highest average household income for the Blocks in the study geography (\$189,265).



## Assessment

MicroBuild is able to differentiate average household income at the Block-level, identifying Block 490490022011088 as having the highest average income for this study area. Other geospatial data providers do not differentiate household characteristics at the Block-level. Their household characteristics will not demonstrate the micro-level differentiation that MicroBuild shows.

# Average Head of Household Age

## Data Study

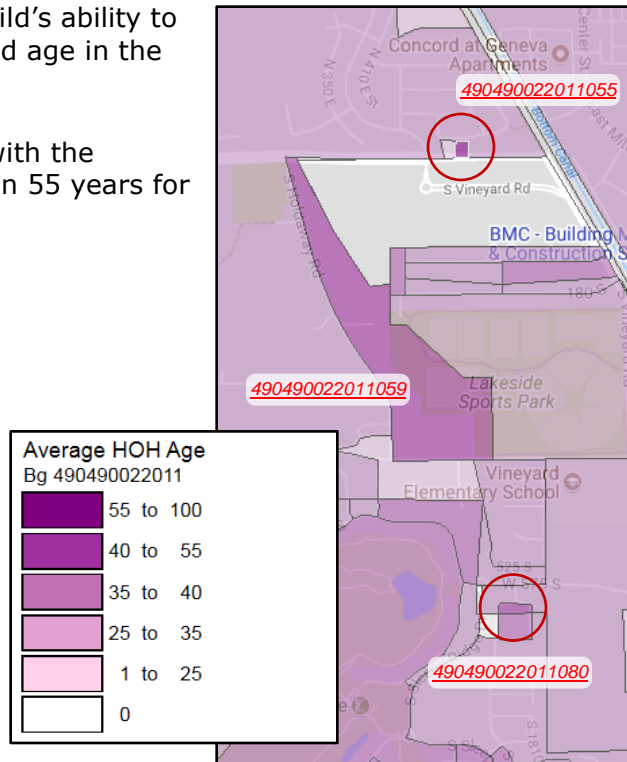
- Geography
  - Block Group 490490022011
  - Blocks 490490022011055, 1059, 1080
- Study Attribute: Average Head of Household Age
- Focus: Compare the average head of household age at Census Block-level for all 104 Census Blocks in Block Group 490490022011, using MicroBuild’s consumer household measurement and aggregation methodology.

## Findings

The map image demonstrates MicroBuild’s ability to differentiate average head of household age in the 104 Blocks in the study area.

MicroBuild identifies three (3) Blocks with the average household income greater than 55 years for the Blocks in the study geography.

- Block 1055 – 77 years
- Block 1059 – 56 years
- Block 1080 – 62 years



## Assessment

MicroBuild is able to differentiate average head of household age at the Block-level, identifying three blocks that have average head of household age greater than 55. Other geospatial data providers do not differentiate household characteristics at the Block-level. Their household characteristics will not demonstrate the micro-level differentiation that MicroBuild shows.

# Household Segmentation

## Data Study

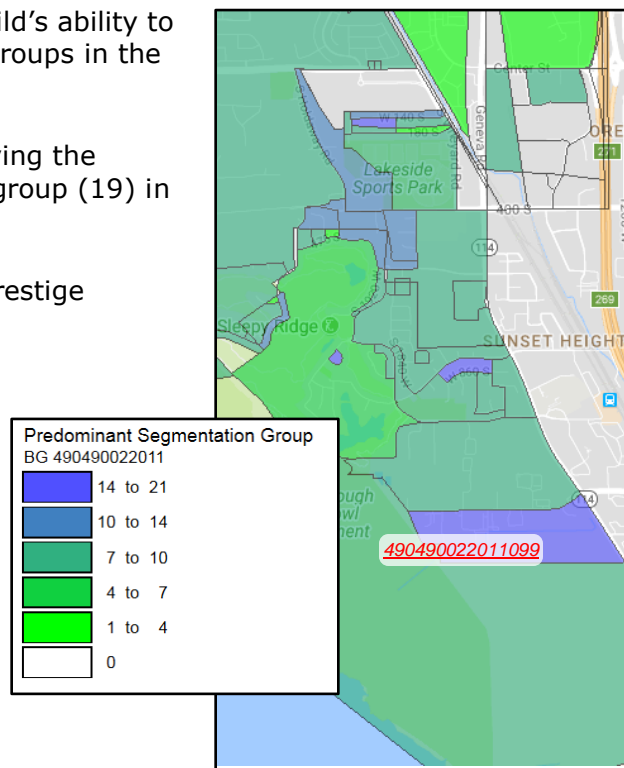
- Geography
  - Block Group 490490022011
  - Block 490490022011099
- Study Attribute: Consumer Segmentation Groups (Acxiom Personix®)
- Focus: Compare predominant consumer segmentation groups at Census Block-level for all 104 Census Blocks in Block Group 490490022011, using MicroBuild’s consumer household measurement and aggregation methodology.

## Findings

The map image demonstrates MicroBuild’s ability to differentiate consumer segmentation groups in the 104 Blocks in the study area.

MicroBuild identifies Block 1099 as having the predominant consumer segmentation group (19) in the study geography.

- Group 19 Cluster Code: Solid Prestige
  - Active & Involved
  - Solid Surroundings
  - Busy Schedules



## Assessment

Personix segmentation group clusters are lifestyle indicators for consumer households. Personix Group 19 represents Solid Prestige consumers and can be used by marketing organizations as an indicator of the lifestyle habits for households with this group cluster code. Other geospatial data providers do not differentiate household characteristics at the Block-level. Their household characteristics will not demonstrate the micro-level differentiation that MicroBuild shows.

# Appendix

## Data: The Foundation for Good Business Decisions

Back in the late 1990's when companies were just beginning to use advanced analytic and optimization tools, they discovered that even though they had the most advanced analytic and optimization tools available, they employed and trained best engineers, and deployed the best technology, it really came down to one thing that most impacted the usable value of the tool: DATA.

Data was, is and always will be the most fundamental element in any advanced tool or application – it underpins every decision today's executives make. It may not be the sexiest tool in the analytic toolbox, but it is there nonetheless, quietly driving site analytics and producing sales forecasts. Not knowing the purpose, nature, source or impact of the data interjects unknown risks into any project or business decision, significantly impacting the usable value of expensive advanced analytic solutions.

Advanced geospatial and location intelligence mapping applications have evolved significantly in recent years. It is now easier than ever for analysts to generate attractive maps and comprehensive reports. However, regardless of their aesthetics, ease of use or advanced features, the usable value of geospatial mapping applications is dependent on the quality of the data that underpins the application. It is the data that defines the intelligence in Location Intelligence. Only when geospatial applications use the most current, accurate and precise geospatial data will the results reflect what's really happening on the ground.

MicroBuild, a patented geospatial and location intelligence data product, is built with change in mind. Using premier consumer household data and state-of-the-art geocoding. Gadberry Group's MicroBuild product is built upon a proven multi-layer, multi-sourced consumer address-based methodology and readily identifies high growth, high decline and shifting demographics long before Census estimates. MicroBuild is the only geospatial and location intelligence data product built from the ground up using consumer household and address data that is aggregated at micro-level geographies (Census Block and Postal ZIP+4).

The geospatial data source that most geospatial platforms employ is U.S. Census data – last completed in 2010. Although the U.S. Census Bureau developed the American Community Survey (ACS) to try and keep up with the changes that occur in the population during the ten-year period between Census surveys, the ACS surveys only 3.54 million U.S. addresses each year, about 2.5% of the addresses across the country. It is therefore impossible for Census-based datasets to reflect the impact of change and the opportunities afforded in high-change locations: re-purposing of industrial brownfield sites, greenfield development, gentrification and urban renewal and revitalization programs.

## MicroBuild Methodology: A Brief Overview

MicroBuild methodology is rooted in a background of consumer data collection, compilation, analysis, mapping and an understanding of how dynamic consumer data can be. It is based on a capability to interpret data that describes change in consumer households as the key to understanding population changes.

MicroBuild Methodology leverages a multi-layer, multi-source approach to define population change, housing characteristics or other types of consumer data for a target area. Beginning with the target area, the data analysis is performed on a micro-to-macro basis to produce a precise, household-level view of population density and change patterns. Using GIS mapping applications, this data is then analyzed and used to create thematic maps that show relationships between the data and geography. Instead of developing processes to eliminate the “noise” in the data, this technique provides a framework to identify and interpret these changing indicators.

### Phase 1 - Creating the Household Baseline

Phase I begins with the creation of the household baseline, utilizing multiple proprietary national address files. These data sets are updated frequently by the data providers from multiple data feeds and is integrated into the MicroBuild product build process semi-annually. Once acquired, the data is geo-coded using a multi-source geo-coding method. All addresses are lat/long encoded and associated with the most precise level of geography possible. On average this process resolves 95% of all address points to the street or parcel. The remaining address points resolve to ZIP+4, ZIP+2, or 5-digit ZIP Code centroid levels. Addresses that do not encode to the parcel are allocated to their respective block group using an iterative population density allocation model based on our most current distribution of rooftop address.

### Phase 2 - Building Household Counts

Unlike the U.S. Census, that attempts to identify and describe every person in the U.S, regardless of whether they have a “commercial” identity – phone, mail, etc., commercially available compiled household files naturally understate the total household population for the nation. This understatement can occur as a result of several factors including consumer mobility, institutionalized populations, and consumer privacy choices. Therefore, any commercial household file must be adjusted in order to account for these populations prior to any meaningful comparison to Census data. A key component of The Gadberry Group’s MicroBuild methodology includes high and low series comparisons to other trusted national data sources. One of those sources is USPS delivery statistics. USPS data provides an excellent contrast to our national address file.

USPS data has several advantages:

- Available nationally
- Presented at low granularity
- Compiled using consistent rules
- Compiled frequently

The disadvantage of USPS data for population analysis lies in the very nature of mail delivery, which can overstate because not every receptacle that actively receives mail represents an occupied household.

Using the combined national address files and USPS delivery statistics, The Gadberry Group's build logic calculates a mid-point between the counts of both sources. The determination of the midpoint is done at the block group level using several variables including urbanicity, housing stock, and geo-precision of the baseline address file. The result is an extremely accurate representation of occupied, commercially viable, households.

### **Phase 3 - Calculating Population**

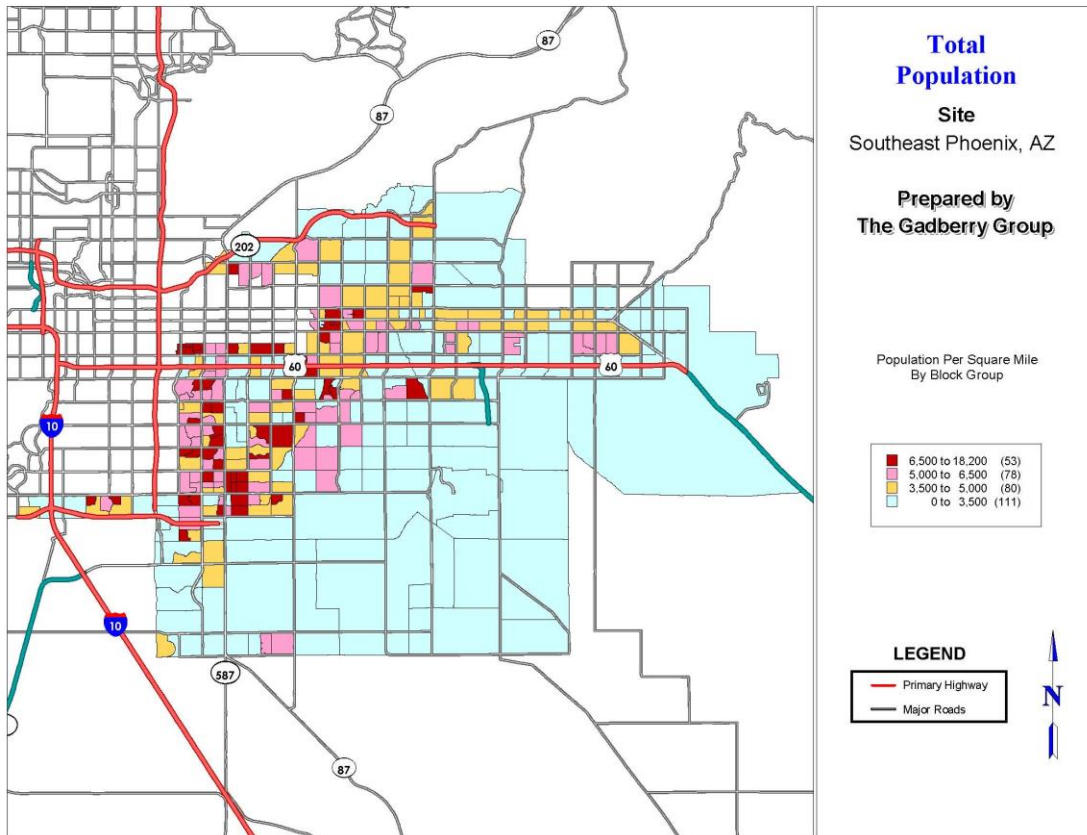
Using the resulting household counts from phase two, population is calculated using Census 2010 average household size, as well as considerations for Group Quarters population.

Gadberry Group's MicroBuild product is the most accurate and precise representation of U.S. households available. It is designed and constructed to specifically identify occupied, commercially viable U.S. households.

## Displaying Population Densities

The map in **Figure 1** depicts a typical study area using both block and block-group boundary data. It displays population at the "rooftop" level as defined by latitude and longitude. In this example it is easy to see where population exists in the study area.

This analysis depicts population by square mile in order to provide meaningful thematic representations since the same population count can produce significantly different views if contained within a block-group with a large land area versus a block-group with a small land area.

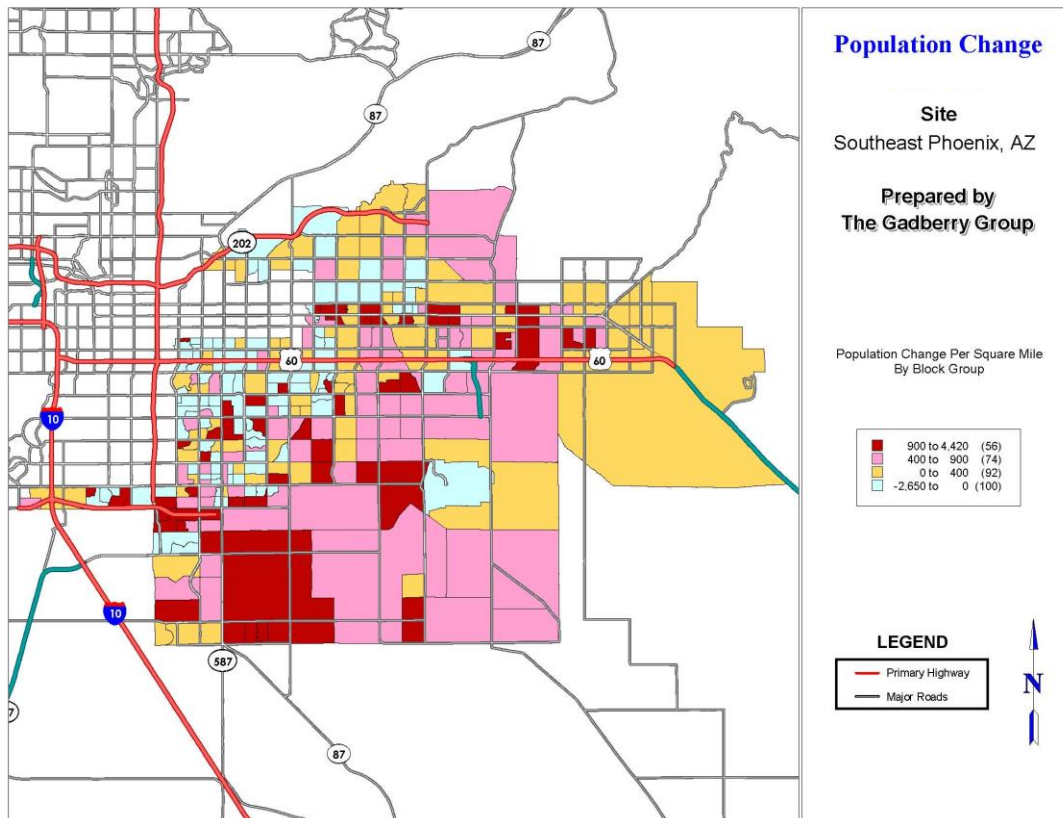


**Fig. 1**

## Displaying Population Change

One of the key value propositions provided by this technique is the ability to identify population change using actual versus estimated or inferred data. The MicroBuild approach provides both accuracy and precision regardless of the level of geography selected, and cannot be replicated using only Census estimations.

Using the technique described in the preceding paragraphs, change in population is calculated and applied at the specified level of geography. **Figure 2** demonstrates how the population change is depicted in a typical study area using block-group boundaries. The red block-groups indicate areas with the highest population growth for this study area. On-site analysis and aerial imagery of this area revealed many new homes under construction and recently occupied.



**Fig. 2**



## Understanding High-Change: Being “Change Aware”

Change creates tremendous business opportunities for companies. For those that have the right geospatial and location intelligence dataset, they will see these changes, see where they are and be ready to *act* on them sooner than their competition.

MicroBuild is “change-aware” – it reports changes in households and shifts in populations that other datasets are not designed to capture. MicroBuild is compiled annually from address-level consumer household sources and therefore isn’t subject to the lag of slow-updating data compilers or the guesswork of projected population changes. MicroBuild measures consumer households (built from the “ground up”) and then aggregates the data to Census Block and higher geographies. MicroBuild is not subject to the skewed guessing which plagues other geospatial data providers.

### About Gadberry Group

Gadberry Group combines over 25 years of geospatial data science expertise to provide geospatial and location intelligence (GLI) data products and services for clients who demand the most current, accurate, precise and actionable GLI solutions for their market and location analysis and research. Headquartered in Little Rock, Arkansas, Gadberry Group is recognized for industry-leading expertise for combining sophisticated data development, software development and professional services to help clients solve their complex GLI business problems. Gadberry Group’s geospatial location intelligence dataset, MicroBuild®, is protected under U.S. Patents No. 8,341,010 and 8,428,999.

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