# Supply and Demand of Apartment Complexes in San Marcos, Texas Progress Report
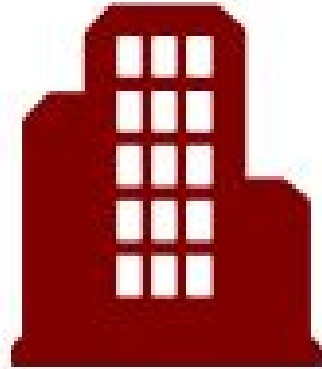


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**March 30, 2020**

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# 1. **Introduction**

## 1.1 Summary

After our presentation and proposal earlier this semester, our group finished the collection of data and are currently making preparations for implementation and visualization. The data collection process included contacting apartment complexes directly and gathering data regarding bedrooms, occupancy, rent, etc. Our implementation & visualization will include a Getis-Ord* hotspot analysis, significance testing and other GIS-related analysis tools. This progress report will highlight completed and present work, tasks we are currently working on, and problems we have encountered so far.

## 1.2 Purpose Statement

The objective of the study is to identify the demand and supply of student oriented apartments versus the population age group 18-24 in San Marcos Texas. With the help of Geographic Information Systems (GIS) analytical tools such as Getis-Ord* Analysis, the division tool and Areal Interpolation we hope to achieve this goal. Along with a brief overview of the cost of development from the East and West sides of Interstate highway 35. This study will help the City of San Marcos determine the need for further development of student oriented apartment complexes.

## 1.3 Scope

The study area of this project is strictly in the boundaries of the San Marcos City limits, to gage the needs of the city and determine if there is any further need for apartments in proximity to Texas State University students. The limitation is that we are only assessing the bedrooms available in apartment complexes not in single family homes, so this does not capture the entire rental market. Bobcat Community Consultants will be creating a visual analysis of apartment growth from the year 2000 through 2019 and a spatial analysis from 2010-2019. Figure A, located in the appendix section showing the area of study.

## 2. **Tasks**

## 2.1 Work Completed

Since the progress report presentation, the team has actively collected the remaining data for the 101 apartment complexes in San Marcos, downloaded the population data from the census blocks, and bordered the San Marcos city limits. The team has assigned three persons to focus on the population data while the other two made the shapefiles for the grouped apartment buildings. To make proper adjustments for the size of the census blocks one of our GIS analysts, Analie Armendariz, decided to implement a new analysis for census block data - Areal Interpolation. The U.S. Census Bureau only provides Block Group Data for the year 2010 and our analysis consists of the years 2010-2019. Using SimplyAnalytics, we downloaded Census Block Group Data from the year 2010 through 2019 ages 18-24. Areal Interpolation allowed us to reaggregate and downscale the SimplyAnalytics Block Group data to The Census Bureau Block data. The interpolation will create a more accurate representation of the demand in San Marcos, TX.

### 2.1.1 Data Collection
- Using simply Analytics census block data from 2010-2019 and

### 2.1.2 Data Preparation
- Shapefiles for Apartment buildings in San Marcos, TX.
- We imputed the data and used the processing tools in ArcMap.

### 2.1.3 Data Analysis
- Joined Market Survey excel spreadsheet created by Bobcat Community Consultants (BCC) to digitized apartment buildings in San Marcos.
- Areal Interpolation for Census Block Group data to Census Block data reaggregation years 2010-2019

## 2.2 Present Work

After the progress report, the team will finish the data analysis portion of the project and begin creating the maps to visualize the supply and demand of apartments in San Marcos.

### 2.2.1 Data Visualization -
- Esri Story Map, showing apartment growth through 2000-2019 and spatial analysis through 2010-2019 with significance testing.

2.2.2  Data Analysis -
-   Supply and Demand analysis through density map (Bedrooms/Students)
-   Using Getis-Ord* HotSpot Analysis for apartments clustering within the City of San Marcos.

2.2.3 Hypothesis Testing-
-   Significance testing with the amount of students to apartment bedrooms. We will be using .2 standard deviation from the mean for significance.

## 2.3 Work Scheduled

| Key:<br>Blue- Completed<br>Red  - Still in Progress | Weeks 1-5:<br>*Jan. 27 - Mar. 1* | Weeks 6-10:<br>*Mar. 2 - Apr. 5.* | Weeks 11-12:<br>*Apr. 6 - 19* | Weeks 13-14:<br>*Apr. 20 - May 3* | Week 15<br>*May 4* |
|---|---|---|---|---|---|
| Data Collection | **Collect Apartment Data** *Jan. 27* | | | | |
| Proposal Presentation | **Proposal Presentation** *Feb. 26* | | | | |
| Data Preparation | | **Prepare Data for GIS use** *Mar. 2* | | | |
| Progress Report | | **Progress Report** *Mar. 30 - Apr. 1* | | | |
| Data Analysis | | **Work on GIS** Getis-ORD* Analysis *Mar. 2 - Apr. 5* | **Work on GIS** Ariel Interpolation *Apr. 6 - 19* | | |
| Data Interpretation | | | **Interpret & Display data** *Apr. 13* | **Esri Story Map** *Apr. 20* | |
| Final Presentation | | | **Begin Final Presentation** *Apr. 13* | **Finish Presentation** *Apr. 29* | **Final Presentation** *May 4* |

## 2.4 Possible problems and concerns

The limitations include the census block data, since the city of San Marcos is not a major metroplex population breakdowns are in larger age groups. Other limitations that we encountered was the city of San Marcos did not have a full record of apartment complex development. Bobcat Consultants had to identify and collect data on the apartment complexes currently operating in San Marcos. Due to the limitation of time and data available the group may not be able to complete the affordability map. If time does not permit we will focus our efforts on the density and clustering of the apartment complexes in San Marcos.

## 3. **Conclusion**

In conclusion, the group has completed the data collection portion of the project and we are currently working on the final portions of analysis identifying which tools we'll be using to compute our final results. Bobcat Community Consultants (BCC) have remained on schedule and will start interpreting the data from our GIS Tools to a final presentation of maps on May 4th. We at BCC are excited to show you our results and feel this is a more appropriate time then ever to determine the needs of the San Marcos student community.

## 4. **Appendix**
*4.1 Figure A - Scope Map*

# San Marcos, TX City Limits



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Bobcat Community Consultants
March 03, 2020
Data Source: City of San Marcos GIS Data
Projection:
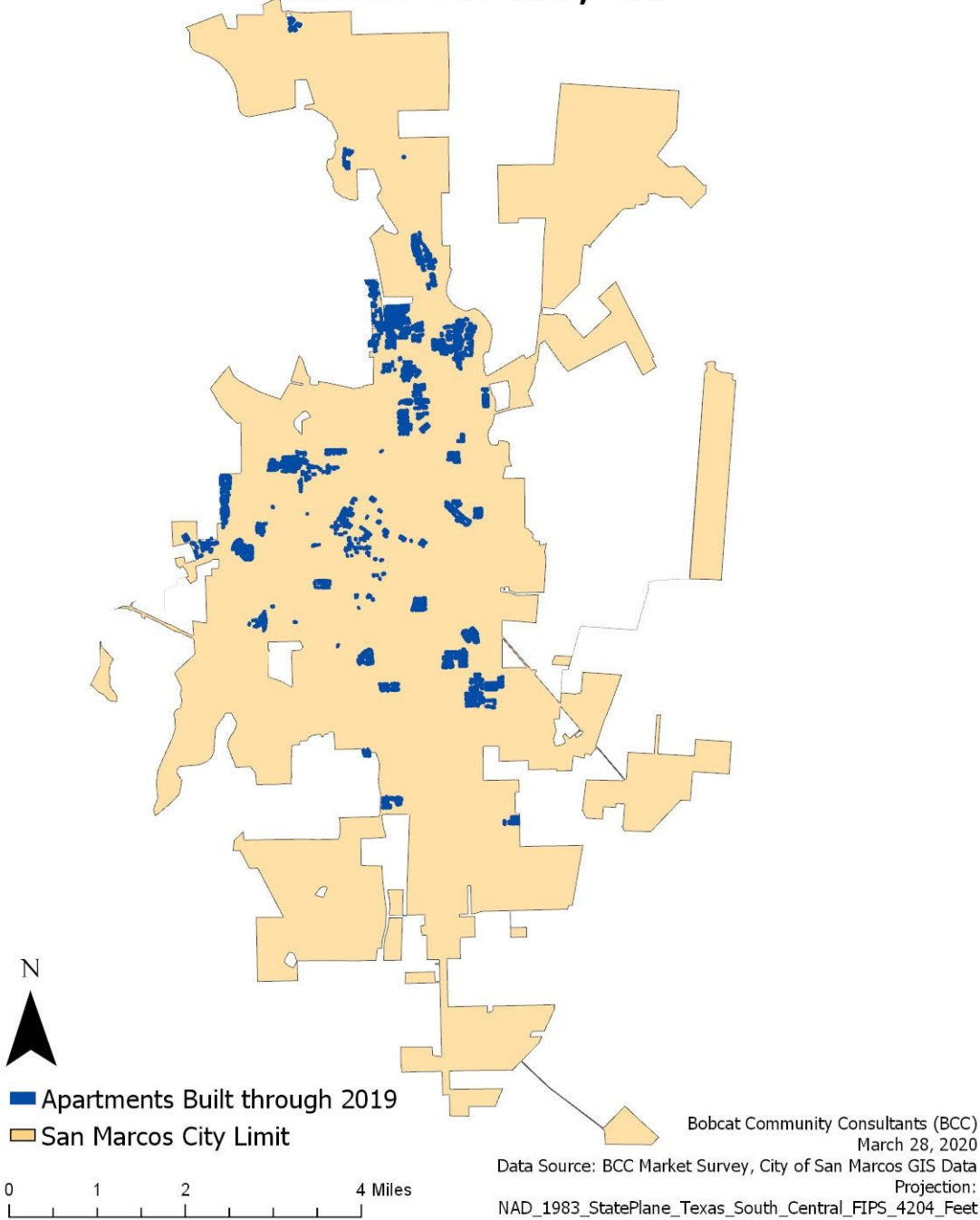lane_Texas_South_Central_FIPS_4204_Feet

☐ San Marcos City Limit

0    1    2    4 Miles

*4.2 Figure B  Apartment growth visualization 2000*

# Apartments Built Until the Year 2000 in San Marcos, TX

N

- Apartments Built Until 2000
- San Marcos City Limit

0    1    2         4 Miles
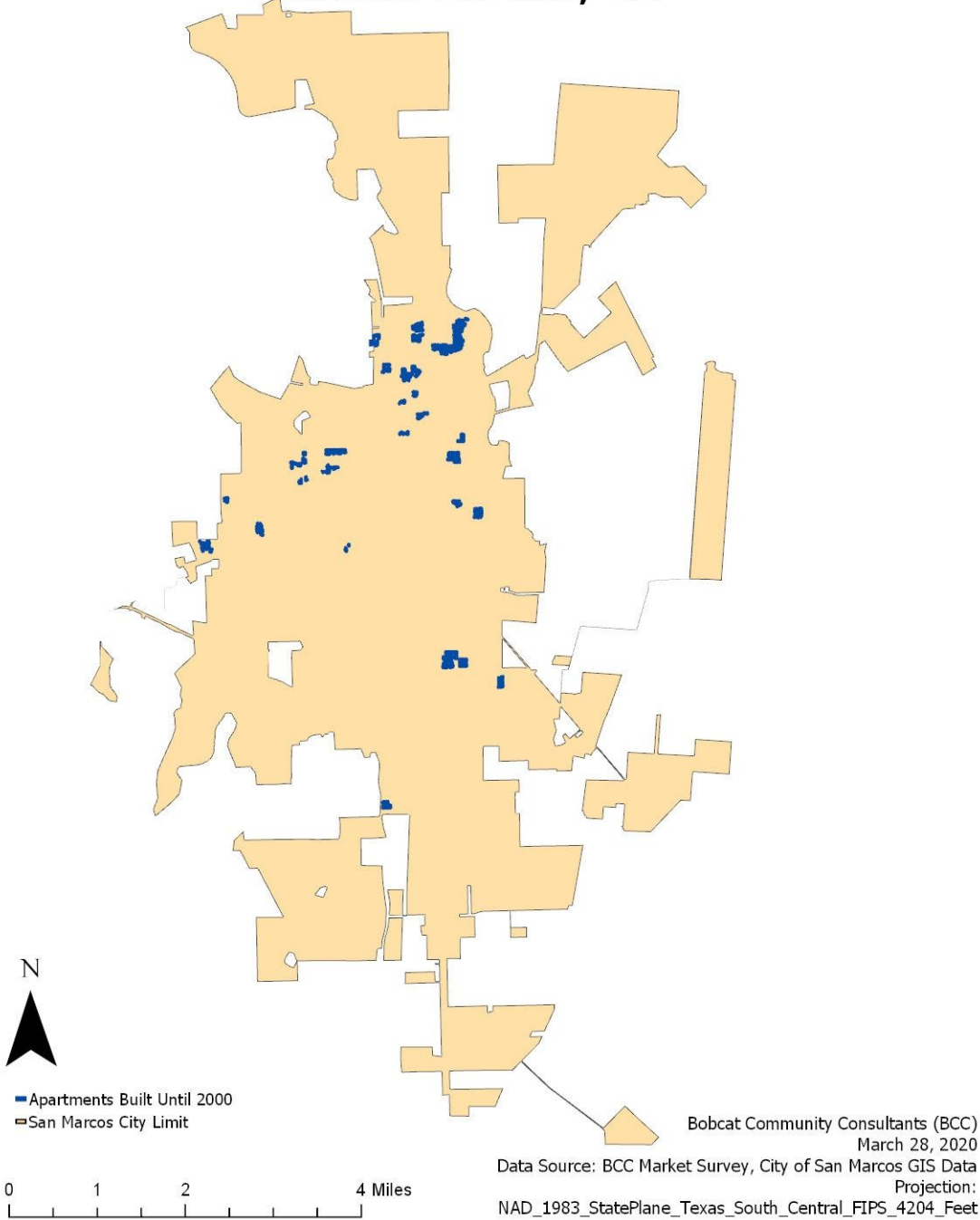
4.3 *Figure C - Apartment growth visualization 2019 (Recently)*

# Apartments Built Until the Year 2019
## in San Marcos, TX



N

■ Apartments Built through 2019
☐ San Marcos City Limit

0    1    2              4 Miles

Bobcat Community Consultants (BCC)
March 28, 2020
Data Source: BCC Market Survey, City of San Marcos GIS Data
Projection:
NAD_1983_StatePlane_Texas_South_Central_FIPS_4204_Feet

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