

# Locational Analysis and Church Planting

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Using GIS for Strategic Church Expansion

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## /Introduction

According to the Pew Forum on Religion and Public Life's 2009 report titled *Religious Commitment Analysis*, the state of Washington is ranked 34<sup>th</sup> out of 46 (some states are aggregated in this analysis such as North and South Dakota) for religious service attendance. The state is also ranked 36<sup>th</sup> for the importance of religion in people's lives (The Pew Forum, 2009). But the purpose of a church is not simply to get people to attend, but rather to act a hub for its membership to provide community services and support across demographics and populations. When there is low-church attendance and a lack of churches there is often a negative impact on the stability of the community (Kinney, 2006). The purpose of this project was to identify the prime location for a second campus of the Fife-based church New Horizon Christian Center (NHCC) using a Geographic Information System (GIS). Central to the vision of this church is actively serving in the community and meeting the needs of those around them, but one location can only affect positive change within a certain area before seeking to expand. Therefore a second campus would open up the ability to provide services and support to an even wider range of people across a much broader area of influence.

Two primary research questions fueled this project. First (1), what are the primary areas which people come from to attend NHCC and what areas are not being reached? Second (2), what is the optimal location for a second campus of NHCC based on the locational analysis performed?

This paper is divided up into five main sections. Section one will examine the theoretical foundation of urban church planting. Section two will be a short look at the project planning

process. Section three examines the methodology used in the project. Section four is a discussion of the results of the analysis. And finally it will conclude with section five which is a critical examination of the project and how it could be improved.

### **/Theoretical Foundation**

While literature on using GIS in the realm of Church planting is sparse, there are a plethora of articles on what factors into the success of a church plant and how to optimize its impact on the surrounding community. It is this body of literature that the theoretical foundation of this project was built upon. This section will consist of a literature review of the primary scholarly sources which were influential in the formation of this project.

Site selection is crucial to the success of a church plant. Susan Brown Snook (2010) affirms this in her article “Reaching New People through Church Planting” when she states that the number one factor in the success of a church plant is “...‘careful site selection,’ [which] might better be expressed as ‘careful community selection.’” (Snook, 2010, pg.113-114) She explains that it is important to take into account not only the physical environment, but also the demographics of the location which is being considered in order for a church plant to be successful (Snook, 2010, pg.113). This article provided much of the inspiration for determining the attributes which together make the prime location for a new campus of NHCC.

In the article by Lewis Burton from the University of Wales titled *Social relationships in the local church*. “A comparison of networks in the rural and urban church”, the author analyzes the social networks of both urban and rural churches and provides some of the differences in how their community networks grow. Understanding these two different types

of social networks is crucial to determining the location of a new church because its location determines the sort of social networks which will be cultivated. In reference to the urban serving church in Burton's analysis (St. Andrew's) he states, "St Andrew's had the ability to reach outside its own committed core of people through its extended social networks to the uncommitted outside its own constituency" (Burton, 2007, pg.71). The same was not said about the rural church. With the urban church in this analysis being more able to effectively reach the surrounding community, it was determined that only areas within city limits would be considered as potential locations in this analysis.

This determination to focus analysis on urban areas was further confirmed in Nancy T. Kinney and William E. Winter's (2006) article titled *Places of Worship and Neighborhood Stability*.

...these social institutions should not be disregarded as good neighbors providing a consistent but quiet presence in struggling communities. In localities where urban blight and decay threaten to overshadow efforts to create community, the mere presence of a religious place of worship may provide limited but notable relief from disinvestment and declining property values. Urban planners may be wise to regard the unique strengths and structural assets of religious congregations as a partial hedge against the physical deterioration or destabilization of neighborhoods. (Kinney, 2006, pg. 349)

This article suggests that urban-serving churches tend to have a far greater impact on their communities than rural ones or churches with traditional architecture. With NHCC's emphasis on supporting and serving the surrounding community, it seems natural then that the prime

location would be in an urban area. This helped to confirm one more of the variables which is taken into account in this project, the income of the surrounding population. Locating into an area with a lower income population will allow for more opportunities to reach out into the community and help revitalize the neighborhood.

In addition to these primary articles, there were also a number of other articles which were instrumental in the planning and execution of this project. These included articles on a variety of related topics including: church zoning (Clowny, 2007); how churches grow and decline based on their urban location (Hadaway, 1982); the theological framework for church planting and what must be taken into account in the surrounding neighborhood of a church plant (Hibbert, 2009); how churches philosophically rewrite imagined geographies (McAlister, 2005); evaluating a churches effectiveness in serving a community (Sharland, 2005); and how to determine the best model for planting a church (Steffen, 1994). Each of these articles inspired and aided the development of this project in important ways.

### **/The Planning Process**

Planning for this project began in the Winter Quarter of 2011-2012. Since the beginning stages there has been little change in its focus or the methods which were anticipated and ended up being used in the analysis. One of the first steps in formulating the project was to determine the focus of the project and then identify the literature which would support the processes and claims made in it (which was covered in the last section on the project's literary foundation).

The concept of seeking out a new church location was first conceived during a conversation with a member of NHCC's leadership team. With the leadership of the church considering expansion to a second location within the next year to two years it seemed ideal that this analysis could be completed in an attempt to show the leadership team the potential uses of a GIS in their planning process. It has been through several conversations with this individual at NHCC, and many workshops with my classmates in the Geographic Information Systems Certificate program that I have determined many of the variables which have been used to identify the prime location for this new campus. After taking the ideas of both the scholarly works and classroom feedback, I began to put together a preliminary project workflow (see Appendix A). This workflow varies slightly from what was finally used in the analysis, but it gives a good idea of the steps taken to complete the project.

### **/Methodology**

Before the analysis could begin in earnest, the attributes of the ideal location had to be determined. There were three different levels of analysis which needed to take place: area analysis; census tract demographic analysis; and parcel characteristic analysis. Each of these progressively narrowed down the parcels which fit the criteria. The prime area characteristics were medium to low number of churches in the surrounding area, and medium to medium-low density of current NHCC members. The census tracts demographics which were sought out were high population, kid and youth density, and median income or below. Finally at the parcel level the following characteristics were needed: vacant; minimum of two acres; relatively close

to both residential and commercial; not excessive tree cover; assessed cost no higher than \$300k; not next to industrial land uses; compatible zoning; and must be within city limits.

Arguably the most important pieces of data for this project were the membership data from NHCC (which was anonymized to alleviate privacy concerns) and the database of urban-serving churches which was constructed using an online church database called Northwest Churches (NWchurches.com). The membership data provided by NHCC consisted of the anonymized addresses of all church members who had been attending over the past year. While the churches database consisted of over 1,200 churches within a 25 mile radius of NHCC. But there is little that you can do without proper spatial data to reference these address databases with.

The other data which were used came from a variety of sources, thus making data collection by far the most time consuming aspect of this project. The extent of the analysis was limited to King and Pierce Counties in Washington State as these are the primary candidate areas for NHCC's expansion. With the analysis covering more than one county, it proved to be the source of much frustration trying to procure data in compatible formats between the counties. While the necessary data for the analysis was easily gathered for Pierce County, King County was far more difficult. But eventually all necessary data was successfully collected, and in some cases digitized based off of city land use and zoning maps.

The next step was to prepare the data for analysis. With most of the data being in consistent formats, I was able to merge the Pierce and King County roads, census tracts, boundaries, and cities layers. These formed the base layers for my analysis. Layers such as

parcels, land use, and zoning all remained divided by county or city due to the conflicting nature of many of their attributes.

Once the county data was all assembled and organized in the map document, it was time to begin geocoding. After creating an address locator for Pierce County and one for King County, a joint locator based off these two separate locators was created. The geocoding which followed did take a while to complete accurately, but both the membership and churches address tables were completed with around 90% of the addresses being matched for each. Once the majority of the points had been geocoded, the 'Point Density' tool within 'Spatial Analyst' was used to create two density rasters from these points; One showing density and distribution of the NHCC's membership and another showing the density and distribution of churches in the region. These rasters were symbolized using the 'Natural Breaks (Jenks)' method with ten classes (excluding zero values). These rasters served as the first level of analysis by determining the areas with medium-low to low church density and medium to medium-low membership density (see Appendix A, Figures 2 and 3). A map of the cities within Pierce and King Counties were overlain with the rasters to determine the areas with the desired level of these densities.

Following the raster analysis, most of the remaining analysis was simply using the 'Select by Location' and 'Select by Attributes' tools. For the census tracts, a z-value was attached to the fields representing median income, total population, kid density, and youth density for each of the tracts. These z-values showed how many standard deviations each of the attributes were from the median for each census tract in the area of analysis. A query was

then created which selected all the tracts which had a high overall population or a high population of youth. Then tracts that had below median income were selected from the current selection. It was these tracts and the immediately bordering tracts which formed the boundary for the parcel analysis. Another query was then created which selected all vacant parcels which were at least two acres in size.

Each of the parcels which were determined to be vacant and more than two acres in size were then analyzed one-by-one to determine how well each fit the other qualitative criteria (level of tree cover, proximity to other land uses, etc.). This last step of the analysis included referencing orthophotos of the areas, cross-referencing parcel info with the county assessors, and in some cases driving out to ground truth the condition of the parcel. By cross-referencing the data with alternative sources such as the County Assessor's Office, a system of checks and balances was established to make sure the data was accurate.

### **/Results of the analysis**

While there were many parcels which were identified as potential candidates, the final selection was narrowed down to four parcels (see Appendix B for more information on these parcels). Of the final selection, one was located in Federal Way, two in University Place and one in Lakewood. Each of these matched the desired attributes of area, tract, and parcel which had been laid out. While there would be little issues with zoning in the Federal Way and University Place locations, the Lakewood location would be slightly more difficult. The parcel matched nearly all the criteria perfectly except zoning compatibility. So this would be the most difficult

to gain approval from the city for, but this is arguably the best choice of parcel based upon the analysis completed.

### **/Critical analysis**

While this project was simple locational analysis, there are a number of areas in which it could be improved. For instance, a number of cities which could have been included in the analysis – such as Kent and Auburn – were excluded due to a lack of available data. This could be alleviated by concentrating more time in the data procurement and preliminary analysis process to determine all possible data that might be needed. Another area for improvement would be further ‘ground truthing’ of the parcels and parcel data. Throughout the project there were continually errors found in the data where parcels that have been filled for years were still listed as vacant in even the most updated version of the county’s data. This error could be eliminated in the project by taking the time to go out to each potential parcel to ensure that the County Assessor’s data is correct and that the parcels are indeed vacant.

Another aspect of the project which would be hugely beneficial to introduce to the project would be a participatory GIS element. Being as deciding upon the location for a new church plant would be hugely contingent upon the wishes of the existing church, there would need to be far more interaction between the individual performing the analysis and the leadership team of the church than there was throughout the course of this project.

**/Conclusion**

While this project was completed in part as a hypothetical scenario of church expansion, the skills which were honed throughout the process are of extreme importance regardless of their application, church planting or otherwise. By identifying these parcels and establishing a model for how to complete locational analysis, the methods used in this project will be invaluable in the event of actual church planting. If one was to spend a good amount of time ensuring that all data being used had an extremely high level of accuracy by ground truthing all potential parcels and also incorporated participatory GIS elements, this project could easily act as a model for effective and accurate consulting for church planters.

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#### Data Sources

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Appendix A: Figures

Figure 1, Original Project Workflow

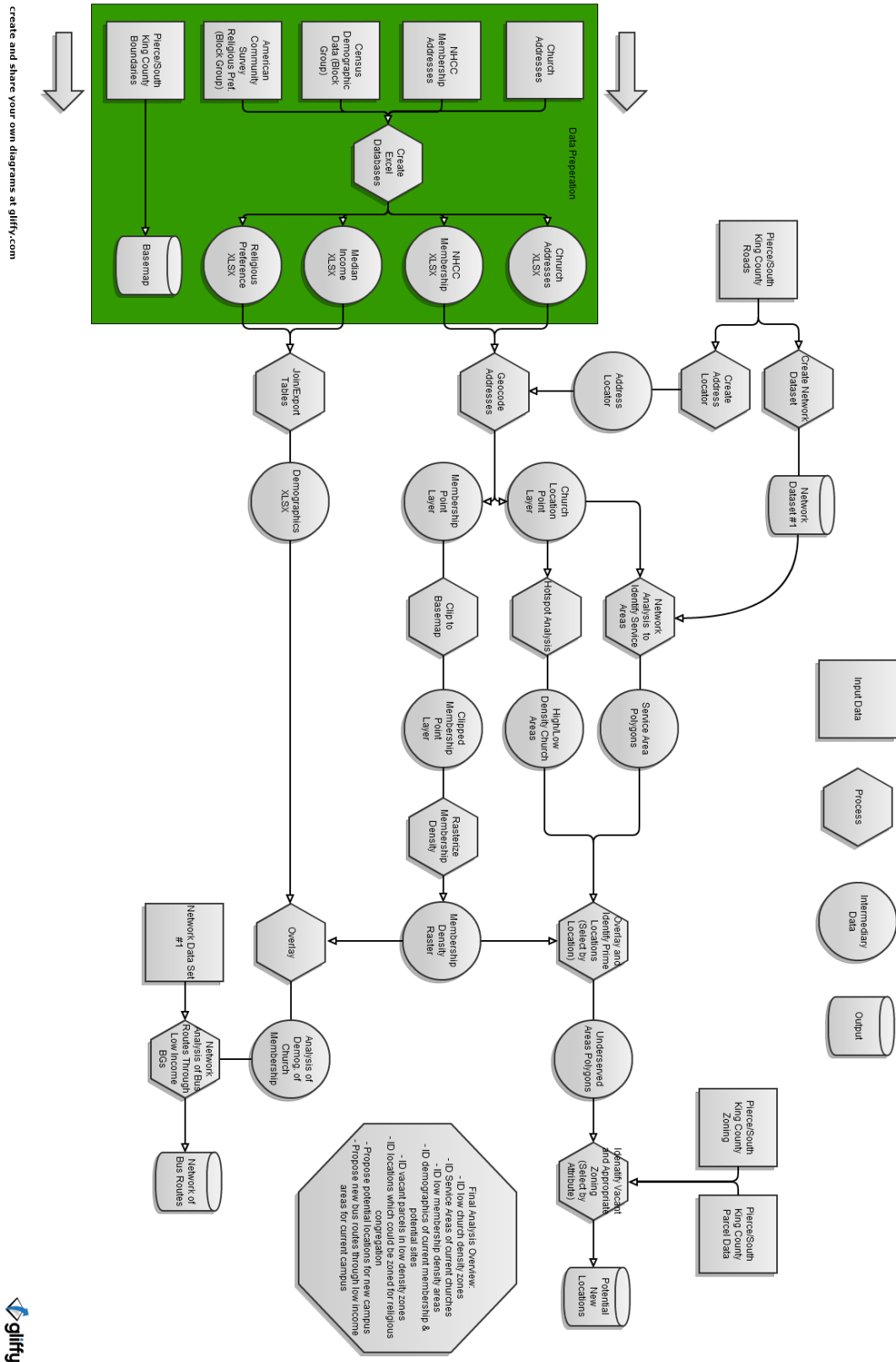
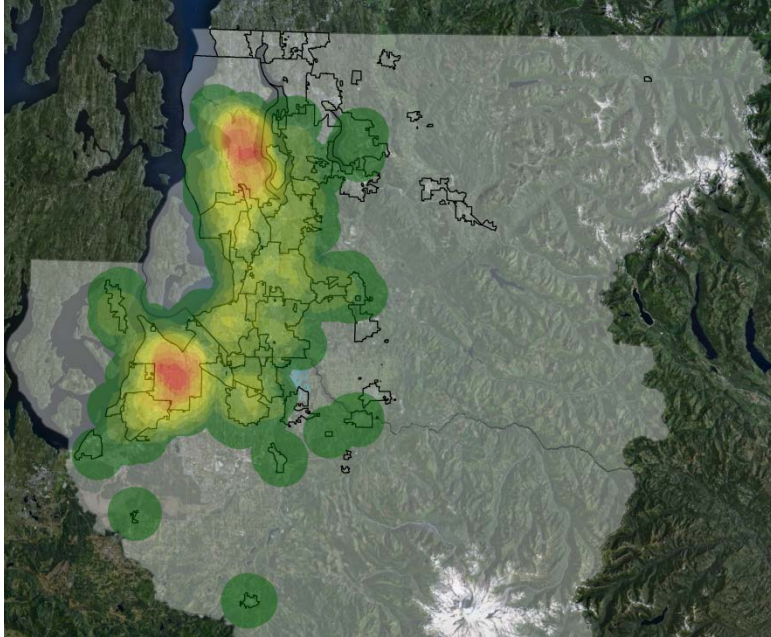
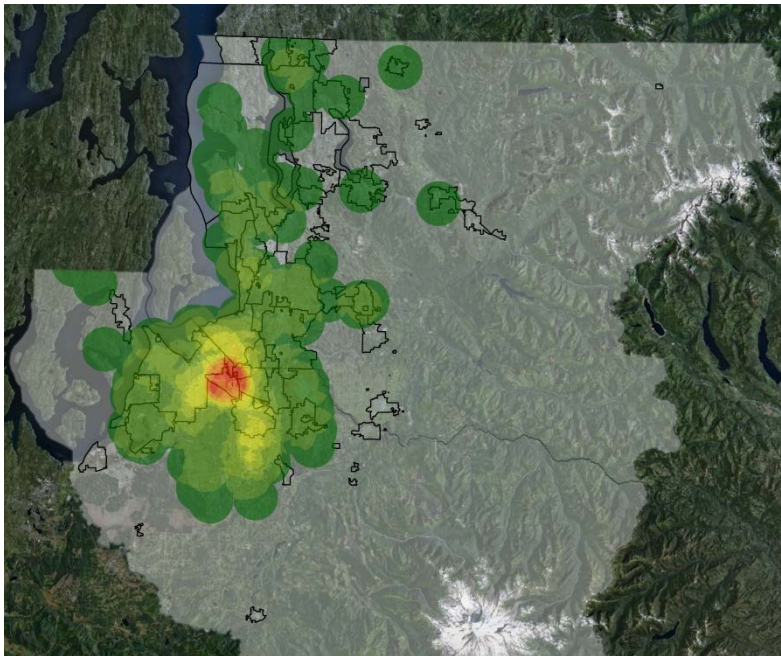


Figure 2, church density raster



Low church density = green | high church density = Red

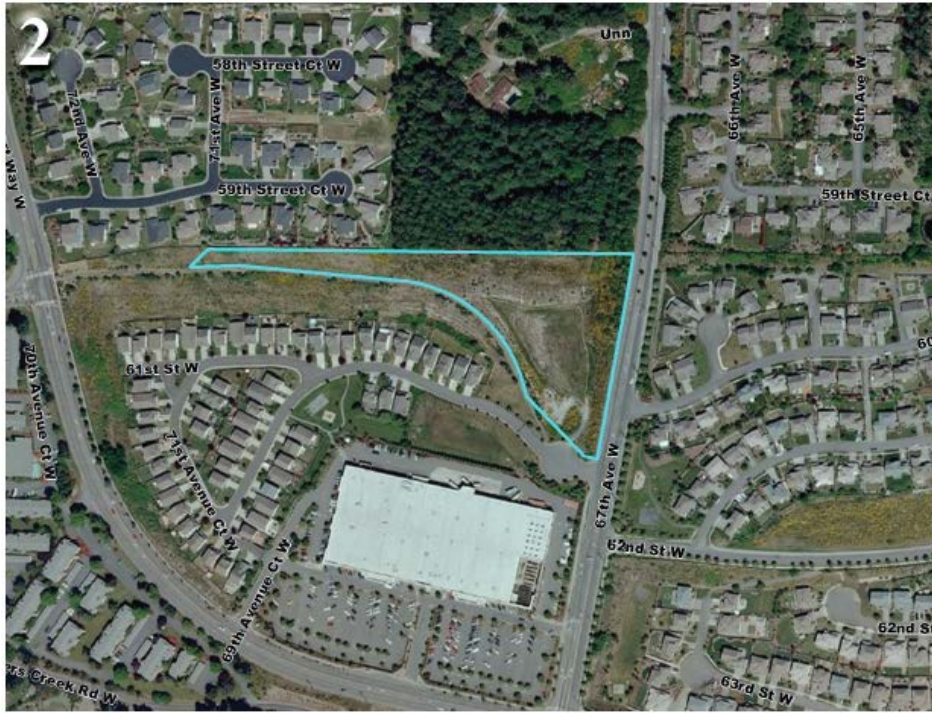
Figure 3, NHCC membership density raster



Low membership density = green | high membership density = Red

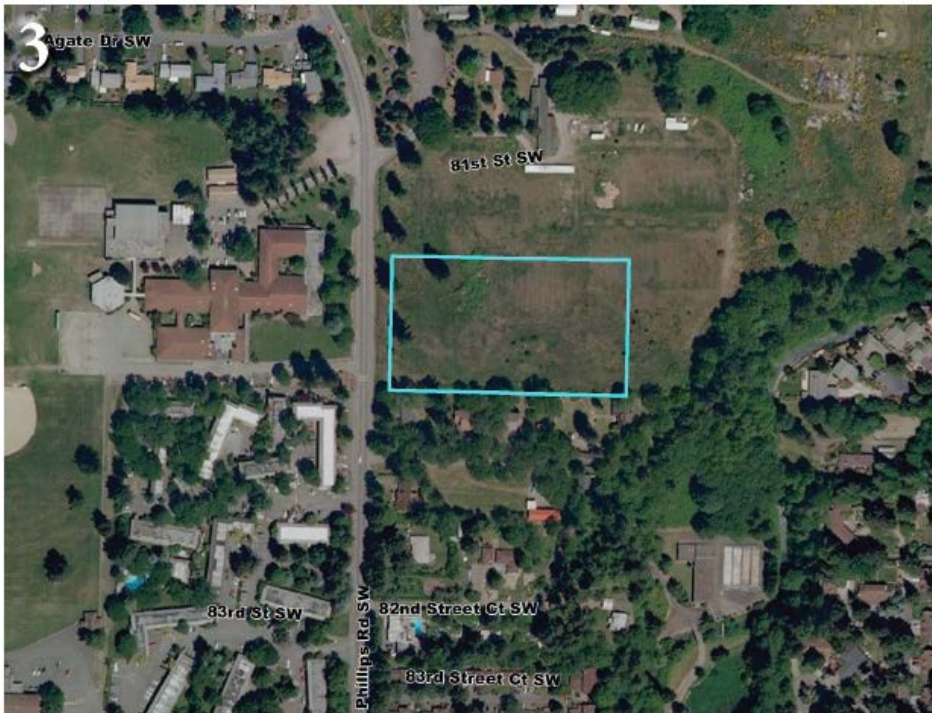


Parcel 2:



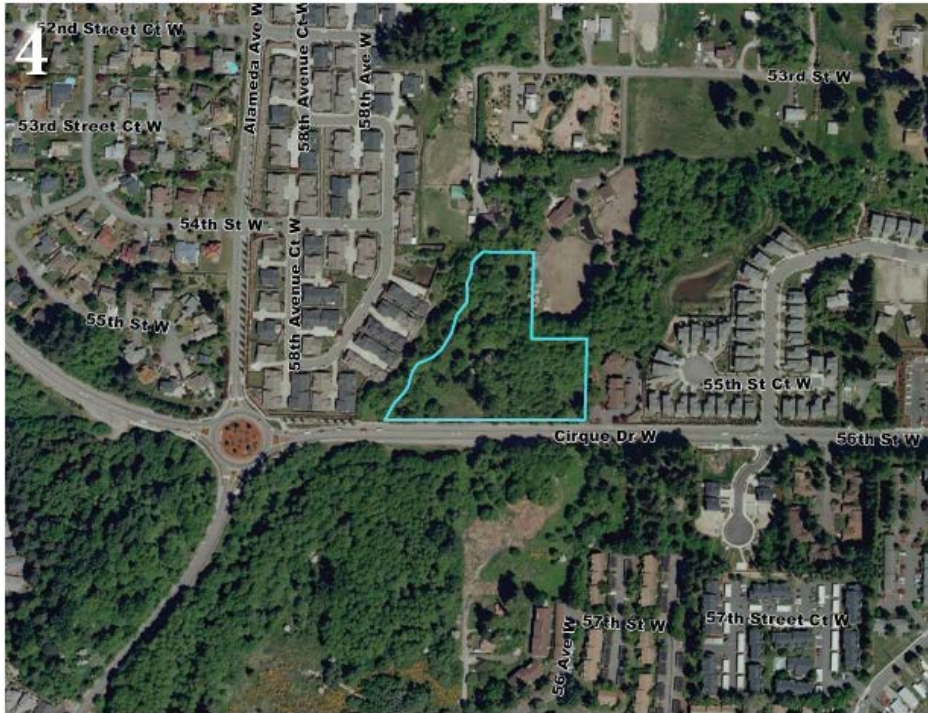
Location: University Place  
Parcel #: 4001700700  
Acres: 4.4  
Assessed Value: \$118,000  
Neighborhood:  
- Median income  
- High population of kids  
- Located near both commercial and residential.  
Density:  
- Medium-low  
Membership density  
- Medium Church density  
Zoning:  
- Residentially zoned, churches allowed

Parcel 3:



Location: Lakewood  
Parcel #: 3085002350  
Acres: 4  
Assessed Value: \$51,200  
Neighborhood:  
- Median income  
- Median population  
- Located near both commercial and residential.  
- Located across from Jr. High  
Density:  
- Low Membership density  
- Medium-low Church density  
Zoning:  
- Recreation and Open Space, would need to be rezoned

Parcel 4:



Location: University Place  
Parcel #: 0220235031  
Acres: 3.9  
Assessed Value: \$224,800  
Neighborhood:  
- Median to high income  
- Median population  
- Located near both commercial and residential.  
Density:  
- Low Membership density  
- Medium Church density  
Zoning:  
- Residentially zoned, churches allowed