

GIS Certificate Research Project

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The different urban, suburban, and exurban environments that have developed in the United States come with a variety of perspectives. Different socio-economic, ethnic, political, and age groups all have varying – and often conflicting – ideas of what city planners should strive for in designing these environments. Probably the least prominent of these perspectives is that of adolescent youth. Suburbia is often considered one of the less youth-oriented forms of urban geography in the United States. Because of this, a survey of the youth and their activities in the suburban community of Puyallup, Washington seems to be an appropriate way to shine light on this matter. This essay is a result of such a survey, which utilized qualitative spatial data and visualized it using GIS. The goal of this survey was attempt to answer the following question: does the built environment of suburban Puyallup enhance the lifestyles of its younger residents, or does it detract from it?

Before describing the preparation, execution, and resulting analysis of the survey it would be wise to spend some time outlining the background literature compiled beforehand. The literature that was examined served two purposes. The first purpose was to help build foundational ideas of what community features would be beneficial for its adolescent population. The second purpose, by examining relevant studies performed in the past, was to acquire some ideas on how to design and perform the actual survey. The former shall be discussed first. According to Dennis, teenaged youth are often excluded from the process of planning the very communities they live in (2006). This can sometimes result from the notion that the role of community planning in the lives of teens is primarily to prevent deconstructive behaviors, not to promote constructive behaviors. This may lead to a lack of desirable destinations (places for entertainment, exercise, social interaction, etc.) for teens. One effect that a lack of desirable community destinations for youth can cause is lower levels of physical activity (Cradock et. al.

2009). In other words, if a teenager lives in a community with fewer places he or she is interested in visiting, this individual will be less motivated to spend time and energy (and, hopefully, exercise time) travelling outside the home.

Also important to destinations and physical activity is access to these destinations, as well as the perception of access. If a teen feels that existing desirable destinations are too far away to easily get to, or that there are physical barriers that seem to block easy access to them, he or she will be less motivated to visit these places (Maddison et. al. 2009). According to scholars, important among youth destinations are public spaces, including parks. Dennis makes the claim that youth are the most frequent users of these spaces, and that youth place special value on open space and greenery (2006). Furthermore, Loukaitou-Sideris and Stieglitz make the claim the inner-city youth, while having access to fewer parks, use them more often than suburban and exurban youth (2002). Youth also can come into conflict with others over the spaces they wish to access. Tucker and Matthews, in their study of youth and rural space, identify three potential conflicts that may arise: youth versus adult, girls versus boys, and group of youth versus group of youth (2001).

In designing the survey, it seemed logical that scholarly claims about the importance of parks and public spaces to adolescents warranted including a component to evaluate access to and quality of these spaces. For this, the writings of William H. Whyte and the activities of his followers at the Project for Public Spaces proved useful. Since this part of the survey was not successful (more on that later), little time shall be spent describing this topic. In essence, the usefulness of a public space can be evaluated by factors related to access, safety, available activities, sociability, and the presence of nature (Whyte 1988).

The background literature also was useful for designing the actual survey and the resulting GIS components of the project. Key among this group of literature was a renowned piece of city planning theory, *The City Image and its Elements* by Kevin Lynch (1960). In this book, Lynch identifies five elements of urban space. These are the routes along which people travel (“paths”), physical barriers that block travel (“edges”), areas where special activities take place (“districts”), social hubs and centers of activity and movement (“nodes”), and features that are recognizable and/or serve as points of reference (“landmarks”). These five elements would form the basis for the survey given out to Puyallup adolescents.

An article by Kwan helped to determine ethical guidelines for the project. These included accurate representation of data, preserving the anonymity of survey subjects, and putting aside biases that may influence the outcome of the project (2006). Other pieces of literature provided examples of how GIS can be utilized in studying youth perceptions of community space. The study performed by Dennis included gathering qualitative data for GIS through focus groups, in which teens would discuss and describe how they viewed the spatial aspects of their communities (2006). The study performed by Dowda and her associates mapped out teens’ homes and the commercial venues they patronized, geocoding the homes and creating buffers to measure their proximity to the venues (2007). Although the exact methods from that last study weren’t used in this one, this study would end up using GIS in a similar way to map subjects’ homes and the commercial spots they visited.

The planning process behind the survey was fairly straightforward. For the spatial extent of the project, it was decided that the “service area” around Puyallup High School (the area where the student body is drawn from) should be used. This area is approximately six miles between its furthest east and west points, as well as between its furthest north and south

points. The choice of this area – which includes the downtown core of Puyallup, the Puyallup River, and many parks and school grounds – seemed to promise interesting insight into youth perceptions of a suburban community. The study subjects for this project would be students that attended Puyallup High (PHS), and therefore had an outlook on the spatial extent. To get a sufficient amount of data, a goal was made to survey at least 50 students.

The survey distributed to students would have two parts. The first part would be a mental map in which the subjects would illustrate their perceptions of the area around PHS. A simple GIS map was provided for this purpose. This featured three shapefiles: a boundary around the PHS service area (provided by the Puyallup School District), a street layer with labeled features (provided by WAGDA), and a “hydrography” layer to show the river (also from WAGDA). Included with this mental map was a sheet describing each of Lynch’s five urban features (paths, edges, districts, nodes, and landmarks). Students would be instructed to map out the paths, edges, and other features that shaped their perception of the area, drawing a special symbol for each type of feature.

The second part of the survey was based off Whyte’s theories of public space. For this, subjects were provided with a sort rubric based off of Whyte’s theories. On a scale of one to three (one being least and three being most), students were to evaluate local public spaces based on such aspects as safety, accessibility, and natural elements. In this case, the “districts” the students identified on their mental maps would be treated as public spaces and evaluated using the rubric. In the end, each district would be given a number score by adding up the ratings the students decided upon.

A number of obstacles had to be overcome to successfully implement this survey and garner some analysis from it. The first problems arose in organizing survey participants. At first,

attempts were made to recruit PHS students to attend focus groups after class hours at the Puyallup Public Library. These were unsuccessful, so it was decided that the surveys should be performed in an actual classroom during regular school hours. Permission was sought, and granted, from the art teacher at PHS to perform the survey in as many of her classes as was necessary.

Additional minor problems became apparent during the implementation of the survey. Most of this was caused by a lack of interest and motivation from the students. This wasn't always the case, and many students provided detailed, labeled mental maps that were perfect for the analysis part of the project. Others, though, weren't drawn very legibly and features weren't always labeled. Furthermore, some students didn't even acknowledge the survey materials placed in front of them and simply refused to participate. Fortunately, after three class periods, enough students participated so that 55 detailed, legible, labeled maps were compiled. This more than sufficed the project goal of having at least 50 study subjects participate.

A couple other problems arose during the surveying, caused by student apathy as well as confusion. First of all, the vast majority of the students either didn't understand the second part of the survey (evaluating and scoring the "districts" as public spaces) or weren't motivated to do it. Therefore, for the sake of time and obtaining consistent data results that part of the survey was abandoned altogether. Another problem involved the features being drawn on the mental maps. The features the students were to create were designed so that they could then be digitized into a GIS as points, lines, and polygons. The features that the subjects were to draw on their mental maps included two types of points ("nodes" and "landmarks"), two types of lines ("paths" and "edges"), and one type of polygon ("districts"). In almost every case, the lines and polygons were drawn correctly. With the points, however, there seemed to be some confusion. Most of the

students created only one category of points on their maps, failing to differentiate between landmarks and nodes. This turned out to be only a minor issue, and in the GIS part of the project all the points were lumped into a single, simple category as “points of interest.”

Other minor problems during the surveying proved to be related to the design of the project. These may have made the results a little less interesting, but no less detailed. As mentioned above, the spatial extent for this study was the PHS service area. During the survey, some students described how their maps wouldn't be very detailed because much of their usual activities, aside from school, took place outside the spatial extent. One minor issue with the project design was even though it required the students to point out the routes (“paths” in Lynch terms) along which they travelled, the survey was not designed to learn how they travelled, whether they walked, cycled, drove private cars, or used mass transit. Again, although these issues may have limited the amount of information that was collected from the subjects, they didn't seriously detract from the effectiveness of the project.

Out of 102 points of interest, the participating students identified a total of sixteen places where they could go for recreational activities in their spare time. Most of these were around the Downtown Puyallup area. The “districts” (main areas of activity) drawn on the mental maps as polygons were combined using GIS processes to show the intensity of activity. The results show that most students consider the downtown to be their main area of activity in Puyallup.

To review, one of the main theoretical assumptions from the background literature is the following: more desirable destinations for adolescents in a certain area will cause them to spend more time travelling on foot, which will lead to healthier levels of physical activity. Key youth-oriented places in this area include the Puyallup Public Library (identified by students 10 times), the Forza coffee shop (nine times), and the skate park (five times). Five different parks were

identified as places of importance. Other locations, such as a comic store or a dance school, were identified by only one or two students, indicating they weren't widely used by the study subjects. Aside from this, six different retail outlets were also identified. In truth, these can't really serve as real, constructive places of recreation. Aside from their own homes, the places identified the most by students as being important were friend's houses. A total of 33 of these were shown on students' mental maps.

Given the amounts of desirable destinations listed above, and the fact that a total of 55 students participated in the survey, the data shows that there isn't a great amount locations for youth-oriented activities. For example, only 10 out of the 55 students said that the library was a place they visited. That's only 18 percent of the students, and the library was the most-identified place of recreation. Similarly, the Forza coffee shop – which has a reputation of popularity among Puyallup youth – was identified by only 16 percent of the students. In fact, many students drew maps that had nothing more than their house, their school, and the route they took between the two. Others maps lacked many points of interest but had arrows indicating students' travel to other communities, like South Hill, Tacoma, and Sumner. We can therefore assume that the area around Puyallup High and the downtown core doesn't have a large amount of youth-oriented destinations, and many students may chose to stay home, “hang out” at friends' homes, or travel to another community for recreation.

In examining the different “paths” and “edges” (routes of travel and physical barriers, respectively) indicated by the students, we are given a perspective that doesn't seem terribly unique. Most of the streets in the study area were identified as routes the students regularly drove on. These included arterials that connect to places outside of the study area. On the more walkable streets of Downtown Puyallup, some high-traffic streets were identified as barriers. The

most notable barriers turned out to be the Puyallup River and the rail line that cuts through Downtown Puyallup. These can only be crossed by car at a few places. Only a little bit of data indicates this, but the fact that the students identified more points of interest on the south side of the river than they did on the north side suggests that this body of water may serve as a mental barrier. It appears that its existence makes the students less motivated to travel northwards.

One of the students' maps indicated a barrier that seems to substantiate the claim that youth and adults may come into conflict over space (Tucker and Matthews 2001). The young man that created this map drew a barrier along the edge of an affluent neighborhood. His explanation for this was that the attitude of the predominately adult residents towards him made him feel uncomfortable and unwelcome.

Three main assumptions regarding youth and parks, public spaces, and natural areas were found in related literature. Firstly, teens are the most frequent users of parks and similar spaces (Dennis 2006). Secondly, youth place special value on the presence of nature in their communities (Dennis 2006). Thirdly, suburban youth tend to use parks less often than inner-city youth (Loukaitou-Sideris and Stieglitz 2002). The PHS survey provides us with data that both support and conflict with these assumptions.

A total of 28 parks exist either wholly or partially in the study area. Only six were identified by students as being places they visited. We can attribute this to at least two causes. First of all, as is well-known, today's youth tend to spend more time indoors doing technology-based activities instead of doing outdoor activities. This may lead to parks being used less often, making this part of the reason why only a few local parks were identified by PHS students as places of interest. In addition, the parks that were identified tend to be either inside or close to the downtown core, the main area of activity for youth. Here, the parks are not only closer to the

students' main points of interest, but also placed on streets with sidewalks. In sum, these parks are easier for youth to access due to factors of proximity and walkability. Conversely, the parks youth didn't identify as places of importance tended to be outside the downtown area and along roads that lacked sidewalks.

As far as the assumption that youth place special value on the presence of nature, the survey data neither proves or disproves this. Some students located on their maps natural areas that wouldn't be considered as parks, like a nearby forest or a swing in the woods. This suggests that youth are attracted to natural areas even if they aren't specially-planned spaces. On the other hand, some natural areas (including some identified as points of interest) were identified as barriers to access, like Lynch's "edges." Examples of these are wooded areas, bodies of water, ditches, and farmland. These two conflicting findings make the assumption that youth value nature seem inconclusive.

It would be appropriate to spend some time here explaining how this project fits in with issues related to wider usage of GIS. In the past, it appeared that GIS in general was being used by the elite to advance their own goals, and critiques of this helped establish PGIS – Participatory GIS (Elwood 2006). This allowed a variety other perspectives into the field of GIS, most importantly those of average people (Cidell 2008). The field opened up for others to get involved. Use of qualitative data in GIS was also expanded, data which up to that point had been largely overshadowed by empirical and quantitative data (Kwan 2002).

It became apparent that PGIS could be used to alleviate conflicts between different demographic groups, particularly when such groups were divided along lines of powerful and not powerful (Sieber 2006). More accessible and open forms of GIS could also be used to, in the words of Pickles, liberate "socially and politically marginalized groups" (1995).

This survey and GIS project fits the definition of Participatory GIS. Adolescents don't typically have much social or political power. They can't vote or run for public office. They typically don't own businesses or maintain professional careers. They also may come into conflict with more-powerful adults over some matters (Tucker and Matthews 2001). Therefore, their needs, desires, and perspectives can easily be overlooked. In the survey at PHS, the teens structured the data themselves to express their opinions and reflect their outlook on their community. It gave them a chance to put forward their often-ignored perspective. In addition, the data they created is largely qualitative. This is characteristic of PGIS which, as previously mentioned, helped underpin qualitative data with more quantitative forms.

The question asked in the opening paragraph of this paper was this: does the built environment of suburban Puyallup enhance the lifestyles of its younger residents, or does it detract from it? It seems as though the answer is both "yes" and "no." Downtown Puyallup has a number of assets and venues that serve the needs of youth. However, these are small in number and local teens may choose to "hang out" at their homes, at their friends' homes, or in outside communities that have more to offer. Local teens seem to believe that this area has good connectivity, and they can access most areas by car. On the other hand, the Puyallup River and other barriers seem to hamper access to some areas. Overall, this area of Puyallup has potential in what it can offer to its younger residents. However, there is still room for improvement.

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