

ACCESS TO RECREATIONAL OPEN SPACE IN PATTERSON, CA: A
GEOSPATIAL ANALYSIS UTILIZING GEOGRAPHIC INFORMATION sYSTEMS

By

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ABSTRACT

ACCESS TO RECREATIONAL OPEN SPACE IN PATTERSON, CA: A GEOSPATIAL ANALYSIS UTILIZING GEOGRAPHIC INFORMATION SYSTEMS

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Many cities throughout California have experienced land use shifts from prime agricultural land to developed industrial and residential areas without considering access to recreational open space. Access to recreation through open space or parks is beneficial for the health and well-being of the community while providing aesthetic value and potential preservation of local ecosystems. Since 2002 the City of Patterson, located in California's Central Valley, has rezoned over 800 acres of agricultural land for urban and industrial use while developers reserved recreational open space (parkland) at locations inconvenient to existing neighborhoods. Although several acres of parkland have been added to the park infrastructure in new subdivisions, there still may be limited access to parks. This study used Geographic Information Systems (GIS) and data collected through public participatory GIS (PPGIS) surveys to analyze the accessibility of parkland for Patterson residents based on proximity, crime and physical barriers, and statistical probability. Participants in the PPGIS study included citizens living in Patterson, community members employed in Patterson, City and County officials, and farmers whose lands either shared a border to the City of Patterson and/or existed within city limits. About one quarter of the total population of Patterson has low access to

recreational open space based on proximity, but more than three quarters of survey respondents felt that there was some kind of barrier keeping them from accessing parks. Some results of this study are available within Patterson's Parks and Recreation Master Plan Draft. Once the Master Plan Draft is approved, it is hoped that the results of this project will help the City planning department make well-informed decisions on improving access to parks, creating secure paths for children, promoting healthy and affordable alternatives to motor vehicle transportation, and better connect residents with poor access to parkland.

Keywords: prime agricultural land, recreational open space, GIS, PPGIS, Parks and Recreation Master Plan

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INTRODUCTION

Maintaining an active lifestyle has always been important to me. Making time to ride my bike, run, explore wilderness areas, and enjoy amenities at parks near my home are fun activities and habits I developed during grade school in Patterson, California. There weren't many sidewalks within walking or rollerblading distance of my home that I hadn't traveled on. When my best friend and I wanted to play basketball we would walk to the school and shoot hoops. If I wanted to take the family dog for a trip to the park, I would strap on my rollerblades and skate to an enclosed baseball field at the Sports Complex. During any of these walks, bike rides, or rollerblading trips I was likely to pass apricot or almond orchards and open fields with tomato or broccoli sprouting from the hundreds of planting rows. Although the Sports Complex and school were two of the best places to play, the travel time and distance to each were long and far enough that playing in the streets in my neighborhood was more common. If there had been parks closer to my home that offered more amenities. I would have had more frequent opportunities for safer recreation with my friends.

Since I moved from Patterson in 2001, the connection I have felt to the town is one of duty. This sense of duty has led me to consider Patterson when developing a project to meet the requirements of a Master's degree. Reminiscing on the limitations of my outdoor activities and desires to have places to play near my home, I became interested in studying the accessibility of recreational open space in Patterson after the City's growth spurt in 1999. Although the rate at which Patterson grew in the early

2000's has not since repeated, the City's general plan considers future growth that will eventually convert surrounding agricultural land and the nearby San Joaquin river front to urban development. It is possible that future park development in these areas may not consider current park accessibility nor address the possible need for park redevelopment in pre-existing neighborhoods. As California's population continues to increase other nearby agricultural towns may one day experience growth similar to Patterson and this study focusing on people's current access to recreational open would be replicable. For the case of Patterson, this project will explore the ways in which people travel to parks, identify which parks people frequent and why, uncover what barriers may exist that keep people from accessing parks, and discuss recommendations that would draw people to utilize parks more frequently.

Recreational open space is the undeveloped land owned or managed by local governments or conservation land trusts for public use (Press, 2002). The State of California defines open space use as "the use or maintenance of land in a manner that preserves its natural characteristics, beauty, or openness for the benefit and enjoyment of the public" (Brown, 2015). In Patterson, California, recreational open space is primarily urban parkland, with or without varying amenities such as playground equipment, benches, or public bathrooms. Like parks, recreational open spaces can be designed, regularly maintained areas, but most commonly are undeveloped, unmaintained, and natural landscapes for the benefit of the public or preservation of habitat (Brown, 2015). Since the City of Patterson does not currently have unmaintained natural landscapes for recreational use or habitat preservation, the use of *recreational open space* may be used

synonymously with *park* or *parkland*. With 29 parks for a total of 98 acres, parkland seems abundant, but without a proper study, the value of parkland to members of the community and local residents is unclear. For the purpose of this project, accessibility is defined as the ability of people living and employed in Patterson, as well as from neighboring communities, to travel to and utilize parkland in Patterson. Accessibility was assessed by investigating factors affecting access to parkland in Patterson which included distance, crime and traffic incidents, and the availability of popular amenities.

Information gathered for this project was organized into a series of maps which collectively express the accessibility of parks within the city of Patterson. Maps were generated as visual representations of the communities' access to parkland using Geographic Information Systems (GIS). GIS is the collection, maintenance, storage, analysis, and output of spatial data often managed in a computer database (Steinberg, 2006). Data in this project was gathered, maintained, and analyzed using GIS and Public Participatory GIS methods. Public Participatory GIS (PPGIS) is the inclusion of a group or population in the collection, maintenance, manipulation, and output of information (Steinberg, 2006). Data collected during the PPGIS surveys identified preferences for and barriers to parks based on amenities and safety concerns. Surveying people living and/or working in the City of Patterson during the data collection and map exploration phase generated information not previously organized in a geospatial way.

Utilizing tools such as GIS and PPGIS in the assessment of open space for recreational use will assist the City of Patterson in meeting California State guidelines for future general plan updates (CA.GOV, 2016). City general plans reflect a community's

land use goals and guide city planning decisions (CA.GOV, 2016). One of the required elements in a general plan includes documentation of open space for both recreational use and habitat conservation. The development of a Parks and Recreation Master Plan encompasses the long term vision of communities' open space, ecology, and parkland resources, including recommendations and strategy for implementation (Gates & Associates, 2012). The timeliness of this study helped inform the Patterson Parks and Recreation Master Plan Draft developed by Gates and Associates in 2012.

REVIEW OF LITERATURE

Aristotle, Hobbes, and Marx discussed the nature of humans as social creatures and identified the desire to interact with one another as an expected behavior of individuals. Some philosophies attributed to these men were first discussed in public fora that today might be called a town square, or a park. Whether the discussions occurred over two thousand years or two hundred years ago, their public location encouraged thought, human interaction, and by example proved that communicating in social settings is in the nature of human beings. The public fora of antiquity are the parks of today and through parks people may gain the active benefits that recreational open space provides for a community's social well-being and physical health.

History of Recreational Open Space Preservation

Proponents of land preservation for recreation early in U.S. history have been found in professionals, political figures, and naturalists. Frederick Law Olmsted is credited with establishing the American profession of landscape architecture, designing famous parks including Prospect and Central Park in New York, the US. Capitol Grounds in Washington, D. C., and the park system for Boston and Brookline in Massachusetts (NPS, 2016). The philosophy behind his landscape design considered a site's natural conditions and belief that parks can positively influence the minds of people living and working in cities in the immediate present and far into the future (Rybczynski, 1999). Olmsted felt that urban environments were crowded and unhealthful and that the purpose

of parks were to provide places for people to retreat from busy lifestyles and socialize in an outdoor setting (Rybczynski, 1999). Influenced greatly by his father's values, Frederick Law Olmsted, Jr., not only carried on the work and teachings of his father throughout his career, but also originated new protections for parkland through his contributions to the establishment of the National Park Service and California's State Park system (NPS, 2016).

Like Olmsted, key political leaders and activists helped to preserve natural wonders designated as national and state parks, to write legislation that supported parks, and to establish animal sanctuaries or nature reserves. Known for his outdoorsy lifestyle, Theodore Roosevelt secured several national parks and protected over 234 million acres of land during his tenure as President (Brinkley, 2009). Just as important as preserving land on a national level, there is need for State and private entities to protect open space locally as well. One hundred years after Yellowstone was named our country's first national park, California State Assemblyman John Williamson of Yolo County authored the Land Conservation Act, legislation enacted to "preserve agricultural and open space" and prevent unregulated urban growth in California (Brown, 2015). Even with the leadership of these land advocates, across the U.S., but especially in California, land preservation for farming, natural habitat, and recreational use has had to compete with urban development. California's property tax system provides a substantial amount of money to city governments, so that local governments tend to promote growth rather than conservation. More than 1.1 million acres were converted to urban use between the years 1984-2012 (Brown, 2015). Although population growth means higher demand for food,

many California farmers found it difficult to continue agricultural production due to increases in property taxes in the 1960s. In 1965, to relieve some of these pressures, the Land Conservation Act, also known as Williamson Act, created a program that assesses property taxes on agricultural lands lower than full market value as an incentive to participating private landowners to keep undeveloped land for agricultural and open space uses (Brown, 2015). The California Department of Conservation recorded that from 2012 to 2013 over 15 million acres were enrolled in the Williamson Act, or about 30 percent of California's privately owned land (Brown, 2015).

Tax incentives for landowners encourage protection of undeveloped land, but a large Williamson Act program can be a financial burden for a local government as it loses out on tax revenue. An alternative approach to open space protection that guaranteed public access was the 1965 The Quimby Act. The Act was written as a protection and compensation measure to provide recreational open space and reduce the financial gap for park funding. John Quimby used his seat at the State Assembly to write the Quimby Act to guarantee future generations would have access to the parks and greenways he saw lacking from new housing developments (Pool, 2003). Section 6647 of the California State Code as amended, authorizes "a city or county to require the dedication of land or to impose fees for park or recreational purposes as the condition of the approval of a parcel subdivision map". Provisions in the Act also include a standard of between three and five acres per 1,000 residents as the proportion of land to be set aside in new developments (276 CA. Rev. Code Sec 6647).

City governments using the Quimby Act can also take advantage of the recently amended law that permits cities to reinvest the interest earned from fees collected under the Act back to parks. This oversight not expressly permitted in the original version of the Quimby Act was noticed by Los Angeles Mayor Eric Garcetti and supported by Assembly member Adrin Nazarian in 2015. A common sense application for funding, but somehow blocked prior to this amendment, has now granted Los Angeles the right to use over \$15 million “in collected interest on park and public space development” (ASMDC.ORG Press Release, 2015). The expectation that parks require frequent maintenance, upgrades, and expansion in order to meet the needs of an active community can potentially hinder any local government from allocating funds to develop new parks as other programs such as police and fire departments often take priority. It is important to promote the recreational and environmental value of accessible open spaces and the continued funding for preservation and management of undeveloped land.

Recreational Use of Parks

Parks offer a variety of amenities to encourage social gatherings and interactions among families and friends. Parks with benches and shade make great locations for the celebration of birthdays, BBQ’s, family reunions, and weddings. Many cultures that gather for family celebrations typically do so in a family dwelling, but for families with greater numbers and a lack of private outdoor space, parks provide more area for rituals and activities. Aesthetically appealing parks allow users to enjoy an outdoor experience without the time and resource-consuming responsibility of long-term maintenance or

improvement costs for a private home's front or backyard landscape. Many cities' parks and recreation departments also support organizations by accommodating community events at city parks such as craft fairs, farmers markets, festivals, as well as musical and theatrical performances. Agricultural festivals are common in the agrarian regions of California. The Gilroy Garlic Festival held at Christmas Hill Park in Gilroy, CA attracts over 100,000 people and incorporates garlic grown in the area into every aspect of its festivities (Gilroy, 2014). The California Peach Festival is an annual event in Marysville that draws around 30,000 visitors every July (Larson, 2012). Festivals are often large venues and would not be possible, if not for the open space that parks provide. Parks have features and benefits that indoor locations lack, such as the comfort and shade of trees, less restricted vertical access for stages and booths, a greater area where people can gather, natural lighting, and finally air flow to disperse the smells and sounds created at an event.

Social and Physical Benefits of Recreational Open Space

Allowing public access to parks brings both social and physical benefit to the people that use them. Parks provide physical benefits to users who enjoy the opportunity to exercise and play outdoors. In communities where people lack interaction with parks there are higher crime rates, depression, and an increase in physical and emotional illnesses (Chiras & Wann, 2003). Where youth miss the opportunity to play and interact with their outdoor environment, they lack an important connection to plant and animal life which can help them develop healthy habits as they get older. A study including

school-age children resulted in more children correctly identifying fictional characters from cartoons than plant and animal species found in their immediate environment (Louv, 2008). These results not only show how there is less emphasis on the natural surroundings, but also that children today experience more entertainment and learning inside than through exploring the world outside. A solution to the increasing number of children and adults leading sedentary lifestyles, contributing to growing obesity in the United States, can be mitigated by encouraging the participation of outdoor activities (Levitz, 2014). Leagues and organized groups that promote involvement in physical activity often choose parks as the location for sporting events like baseball, rugby, soccer, volleyball, and disk golf. Trails and paths, obstacle courses and equipment for adults and children provide people of all ages the chance to live healthier and more active lives. Physical benefits for children that participate in organized sports and also play in parks or recreational open space include a reduction in the issues associated with Attention-Deficit/Hyperactivity Disorder, improved cognitive abilities, and resistance to factors leading to stress and depression (Chiras & Wann, 2003).

The social and physical benefits of time spent investigating the wonders of nature cannot be replaced by artificial substitutes like those generated through an electronic interface; neither can they be replaced by simply reading about them inside a traditional classroom. A study in Denmark compared the outcome of children learning in both a traditional kindergarten and an outdoor kindergarten. Children participating in the study that were learning in nature-focused kindergarten showed more tendencies toward leadership during play, were more alert, used more of their whole bodies during

activities, and were more imaginative in creating games (Louv, 2008). It would likely take an act of legislation to require school districts across the United States to integrate learning in outdoor classrooms in every school, so until then there is value in making time for children to learn and play in outdoor settings such as playgrounds and parks. Schools that participate in outdoor lessons can take advantage of the amenities provided on school grounds and at nearby parks by taking nature walks and focusing on plant identification, animal watching, and habitat protection. The inspiration derived from being outdoors is a common benefit witnessed in the childhoods of many literary, political, and otherwise influential contributors to society. Jane Goodall, John Muir, Mark Twain, T.S. Eliot, Thomas Edison, Eleanor Roosevelt, Beatrix Potter, and Cesar Chavez are just a few of the individuals whose lives were heavily influenced by their early connection to nature (Louv, 2008). Parkland is not only an environment proven to inspire young people, but also imitates a classroom environment in itself. With paved paths and meandering trails, many parks have become the destination for families to teach children how to ride a bike, fly kites, and toss a disc as well as enjoy the social aspects of sharing a picnic and practice cooperative physical games.

Development and Economic Benefits of Recreational Open Space

Cities that encourage parkland use may recognize their contribution to the well-being of the people in a community, but they also know that recreational open space adds value to the undeveloped and developed areas of the city (Baldassare, 2000). In growing communities, reserving parkland during a city expansion and designating habitat for the

protection of local wildlife while preventing environmental degradation can help moderate the rate at which land is lost to development. The Californians and the Environment Survey conducted by the Public Policy Institute of California in 2000 showed that over half of respondents were interested in the use of public funds for the purchase of undeveloped land to prevent further development (Baldassare, 2000). Undeveloped landscapes have an aesthetic appeal, especially in areas such as the rural California foothills, where land use changes seem more dramatic than in flatter urban areas. People increasingly have expressed a desire to avoid continued urban sprawl as found in the Los Angeles area where traffic and smog are significant problems (Press 64).

Urban development changes the aesthetics of the environment as well as how the environment functions as a part of an ecosystem. Humans depend entirely on the earth's ecosystem services which include provisions like food and water, regulation of the environment or climate, fulfilling cultural needs through recreation and aesthetics, and supporting services such as the production of soil (MEA Board, 2005). Keeping park spaces and especially undeveloped natural landscapes from being developed near cities improves ecosystem services provision to the cities, from clean air and water to recreation opportunities. This positive relationship enhances the cultural capacity of a community and its attractiveness to residents, which in turn brings more revenue in sales and property taxes to the area. Preserving undeveloped natural spaces has aesthetic and cultural benefits and supports ecosystem services (Press, 2002). One park established for the preservation of habitat and recreation is the Theodore Roosevelt National Park in North Dakota (NPS.GOV, 2016). Representative of flatland areas with high risk of

flooding, preserving the floodplain of the Little Missouri has supported a diversity of animals, plants, and habitat area within the park (NPS, 2016). Designating parks in floodplain areas can help keep the land surrounding rivers free of buildings which often fall victim to floods, while benefitting wildlife, and promoting forestation and the reduction of soil erosion. Securing adequate acreage of maintained parkland is important for the health and well-being of a community, but preserving unmaintained open spaces in or near urban environments also has the potential to protect ecosystem services.

Recreational open spaces are made up of natural undeveloped land or parcels of land maintained as parks. Open space or parks as undeveloped land that borders developed land has the potential to provide buffering benefits for both industrial and residential zones. A buffer “provides space, obstructs undesirable views, and in other ways reduces the impact of one thing upon another” (ASPO, 1960). As communities expand their city borders into previously worked farmland, remaining prime agricultural areas often become the buffers to larger industry. Prime agricultural land “meets specified soil quality, forage production, or income criteria” as designated by the Land Conservation Act (Brown, 2016). Though not intended for public use, prime agricultural land has the capacity to buffer less appealing industries such as dairy production and food processing plants. Agricultural land is also easier to convert to parkland and rehabilitate back to habitat for wildlife than commercial or industrial properties.

The need for buffers between land uses can be expressed by residents, environmentalists, or even the agriculture industry. An American cheese producer in Humboldt County, CA, Cypress Grove Chèvre, encountered opposition from neighboring

residents when it sought to expand production in 2011. The concerns voiced from residents were mostly regarding air and water quality, so settling on a 38-acre parcel 10 miles north of their originally hoped for location, the Cypress Grove goat dairy is now surrounded by rural farmsteads rather than adjacent to residential development (Hoover, 2011). As producers of award winning cheese Cypress Grove sets industry standards in best practice for their model dairy and this pride and care is held by farmers who have chosen to reduce the amount of chemicals used in modern farming methods by growing organically. Although the number of organic farms has increased over the years there are still many commercial farms that continue to use pesticides and the locations of these farms near schools and homes have caused concerns for the health and well-being of children and families exposed to pesticide overspray. Land buffers such as groves of trees or undeveloped space can be used to protect adjacent neighborhoods from pesticide use. A PPGIS study performed by Sheila and Steven Steinberg in 2007 mapped “pesticide use and its proximity to sensitive facilities like schools and playgrounds in six California communities” (Hoover, 2009). Complaints by those living or working adjacent to pesticide use were consistent with flu-like symptoms, but without proper reporting, it was difficult to link exposure to pesticides with non-compliance to pesticide reporting laws, and those affected were unable to prove negligence (Hoover, 2009). Through the PPGIS and Agricultural Farmworkers California study, the authors empowered community organizers to work with farmland owners to find solutions and bring about positive and healthy change. Results of the study include an interactive online map with community testimonials, and the basis for future legislation to require buffer zones around areas most

affected by pesticide drift (Hoover, 2009). It is important for communities like Patterson to consider the need for reserved farmland for production value and buffer space between agricultural zones and developed areas when planning future city growth. The setting of standards for agricultural buffer zones would also protect residents from the potential health risks associated with the fertilizers and chemicals used in agricultural industry.

Buffers may not be a feature commonly seen between agricultural and residential areas, but are frequently found between business, industrial, and residential areas. In developed areas, living close to public transportation and freeways is time saving for commuters and travelers, however, the noise level and view of these places often deters people from buying homes near main thoroughfares. Ways to mitigate noise pollution include planting bushes and trees along these major roadways as buffers which can soften and filter traffic sounds while providing a more appealing landscape. City planners may choose to separate residential and busy roads or highways with a landscaped buffer that often doubles as non-motorized or pedestrian corridors. A bike lane on San Ramon Valley Blvd, parallel to Interstate 680 in San Ramon, CA, has more than 5 miles of foliage planted adjacent as a visual and sound buffer and air filter for neighborhoods located to the West of the highway. The scenery offered by bushes and trees with the addition of benches and widened paths for pedestrians, has a slowing effect on traffic, and as a planning technique to relieve traffic congestion, is popular in major cities like Portland, OR., Seattle, WA., and Davis, CA. (Chiras & Wann, 2003).

City officials who ensure the design of green spaces and parks as aesthetic buffers to disguise or hide unattractive or noisy land uses are also aware of the economic benefits

that parks and open space provide as they draw the attention of local and tourist populations. At the end of October in 2014, Kissimmee, Florida announced that the final phase of its \$35 million (Levitz, 2014) Lakefront Park Project had been completed (City of Kissimmee, 2014). Rather than spend money developing new properties, the mayor saw a value in enhancing the city's downtown through a park renovation which included properties "along the lakefront and improving the adjacent streets" (Levitz, 2014). Both Kissimmee citizens and visitors of the city are drawn to the improved park and its amenities which border downtown businesses. As a result of the park renovations downtown patronage has increased, the attention has encouraged new entrepreneurship, and the added financial benefit has put the city "on [a] more solid footing" (Levitz, 2014). In Atlanta, Georgia a \$3 billion, 25-year project to improve transportation and city parks is currently underway. The completed project called The BeltLine will reserve 1,300 acres of recreational green space and nearly 33 miles of pedestrian trails as well as add a light rail transit system, create 30,000 jobs, and over 5,000 multi-units designated as affordable housing (Leviz, 2014). Measuring the positive economic impact of renovating a park will require a comprehensive economic analysis as is being done in Chicago for its Park District, but park improvements in other cities have already proven economically beneficial through music festivals and other planned events bringing in thousands to millions of dollars (Levitz, 2014). Even if the focus of local governments is to enhance or develop parks on the basis of economic growth, the improved access to parks will have positive health benefits, but their design will determine their use.

The Design of Recreational Open Space

After World War II the design of streets and new housing developments focused on automobiles, modern conveniences, and getting people into affordable homes and having families. Suburban tract homes included a small, easy-to-maintain yard which gave single-family units a space of land to call their own without the trouble of tending to a larger property. Today, the stresses of a fast paced life and media-driven lifestyle have further reduced outdoor living spaces once used for socializing and exercise to make room for a larger floor plan in the home (Chiras & Wann, 2003). As Chiras and Wann note, the shift in living space from outdoor spaces to an increase in home size hasn't necessarily increased the overall happiness of homeowners and many people now design their large urban dwellings to resemble country farm homes with features like barn doors and rustic décor to mimic the once everyday life style of rural living. To counteract the decline in satisfaction for suburban living, the authors suggest ways to revitalize the way people interact outdoors within their neighborhoods. The authors discuss revitalization through five basic types of features in *Superbia!*; "paths, edges, nodes, landmarks, and districts" (Chiras & Wann 49). Paths may be roadways, paved pedestrian trails, alleys, and corridors for wildlife; edges are boundaries between neighborhoods like waterways, or open spaces; nodes are places that people travel to and from connected by paths; landmarks are easily identifiable features such as buildings, regions, or vegetation like a large tree or community garden (Chiras & Wann, 2003). All five features: paths, edges, nodes, landmarks, and districts; can be fulfilled in a neighborhood by the simple addition of a vegetated buffer or reserving larger open space that a city can maintain as a park. Reserving undeveloped open space to act as buffers, landmarks, nodes, and paths

provides a pleasing, aesthetic and recreational attraction that families and individuals can enjoy while protecting wildlife habitat and biological diversity.

Consideration for Land Preservation or Redevelopment for Parks

The converting of undeveloped land to agricultural and industrial use by paving over permeable landscapes, channeling and damming water ways, and using land for waste disposal negatively affects neighboring habitats and open space in sometimes irreversible ways. Land conversion to suit human needs without consideration of its impact, is often the cause of considerable damage to “habitats found along the coast, riparian, wetland, and estuarine zones as well as flat grasslands of the inland valleys [in California]” which have been affected the most (Jensen 91). Species endemic to a particular habitat or those living in a narrow range may be at risk, such as the Palos Verdes blue butterfly that was thought to have gone extinct in 1986 after the last of its habitat had been converted to a baseball field (Jensen 1993). In this case maintained parkland was converted out of existing undeveloped open space without considering all affected stakeholders and to the detriment of a species. While the development of recreational space is beneficial to a community it should not be to the detriment of a species. In communities where undeveloped land is lacking or has been preserved for habitat, remediating formally industrialized, contaminated areas, known as brownfields, may be the only way to introduce recreational open space while mitigating some of the impact that development has caused (Weber, 2010). An often prohibitively expensive endeavor, rehabilitating brownfields is not typically an option and users often debate its

redevelopment for fear of previously contaminated land affecting its new users. Rather than trying to mitigate issues caused by poor planning it is better to consider the need for ongoing park use and reserve land concurrent with development.

Planning the preservation of land or design of a park can be done with both its environmental impact and community need in mind. PPGIS has been used to engage community stakeholders as a collaborative tool to “analyze the distribution of parks and park resources” and in support of social justice movements (Treuhaft, 2009). Because the use of GIS technology has the potential to both empower and marginalize communities, researchers and organizations have an opportunity to utilize PPGIS to advocate for equal access to parks (Harris and Weiner, 1998). The City Project, a southern California organization whose mission is to ensure equal access to healthy communities for everyone, has been committed to improving the lives of children and families through research and project development. In 2011 The City Project utilized “narrative analyses, GIS mapping tools, and demographic and economic data” to publish a policy report “Healthy Parks, Schools and Communities: Green Access and Equity for Southern California” (The City Project, 2016). The recommendations included in that report discuss prioritizing projects based on a map identifying “Park Poor, Income Poor and People of Color”, defined by communities where the household income was below \$47,331 and fewer than “three park acres per 1,000 residents” (The City Project, 2016). Since the report was published, The City Project has influenced the creation and preservation of over 1,000 acres of green space in Los Angeles State Parks, Baldwin Hills Park, Ascot Hills Park, Vista Hermosa Nature Park, and Kellogg Park (The City Project,

2016). The report has also been cited by governmental agencies such as the National Park Service in acknowledging the “disparities in park access and health based on race and ethnicity” especially with regards to the lack of transportation to regional parks (The City Project, 2016). Through the work of non-profit agencies and community-based groups such as The City Project participatory GIS can be used as a powerful tool to advocate for financial resources and compliance in environmental justice and civil rights laws by engaging in active participation of community-based planning.

Barriers to Accessing Recreational Open Space

Recreational open space has been established as having both social and physical benefits for people and the environment and economic benefits to a community. Unfortunately social, physical, and economic barriers can prevent the development of and limit access to recreational open space. During the planning stages of parkland development, land may be restricted by physical limitations both natural and anthropogenic. Steep gradients, water ways, desert landscapes, rough terrain, and areas with unstable soils may prevent planners and developers from considering locations for recreational open space or limit the types of uses of parks. Communities with previously developed, but unused properties like closed factories or condemned housing could potentially repurpose these locations for parks. However, locations where industry and businesses once operated can potentially leave brownfield sites which are costly to remediate and may reduce public confidence in the safety of these places from being recreationally viable (Harnik and Donahue, 2011).

In addition to barriers preventing acquisition and allocation of land for parks, many factors can prevent the optimal usage of recreational open space. Access to motorized vehicles or public transportation is a key factor, as distance can inhibit usage by potential park visitors. Most research on the subject notes that people are willing to walk between a quarter and half mile to parks, with variables such as population, density, age, and specific characteristics of the destination, influencing choice (Donahue, 2011). Limited access can also be caused by physical features common in suburban or inner city areas. Chain link fences meant to keep students on school grounds and trespassers out limit the availability of recreational fields and playground equipment when school is not in session. Fences, canals, active railroad tracks, private property, and busy streets also keep people from traversing more direct routes to recreational spaces. Weather can be both an influence and deterrent to accessing parkland. Fair weather is the perfect excuse to take advantage of outdoor amenities except in the heat of summer at parks with little shade. During rainy days an outdoor playground may not have the same appeal, or access, if the park itself doubles as a storm water basin. Even parks with all of the intentional design elements conducive to attracting visitors, some parks may be less accessible due to external influences producing safety concerns.

A person's sense of safety based on reported incidents or understanding of a place may limit their willingness to use a park. In England in 1285 King Edward I required a clearing of at least 200 feet on either side of a road to prevent the cover of thieves or attackers preying on royal carriages or passersby (Kuo and Sullivan, 2001). Although the seemingly obsolete decree from the thirteenth century may have been ordered after

robbers ambushed aristocrats, studies in the 1980's similarly accounted for people's fear of places with dense vegetation where "undesirable persons seeking privacy for unacceptable activities" may hide and wish ill will upon visitors (Schroeder and Anderson, 1984). Taking into account that forested areas or overgrown foliage in parks may drive people away or harbor some deviant behaviors, parks can be designed to do the opposite. Recent studies looking at green spaces in or around neighborhoods have found that properly maintained vegetation in parks reduces crime and unlawful activity and even increases socialization; further strengthening the bonds of neighborhoods (Kuo and Sullivan, 2001). Areas of trees with tall canopies and low laying flowers or hedges provide people the safety of increased visibility and to criminals an understanding of "implied surveillance" or guardianship (Kuo and Sullivan, 2001). As the design of green spaces has the potential to influence the behaviors of people, then identifying the location of criminal activity around parks may shed some light as to how people react to actual crime as a potential barrier to accessing parks.

Since the Schroeder and Anderson study in 1984, new research methods have helped examine people's understanding of reported criminal activity in or around parks and what efforts can be done to mitigate problems caused by perceived or actual unlawful incidents. Suau and Confer from the University of Florida utilized GIS to find out whether criminal activity in Gainesville, FL, affected use of the City's parks and analyzed people's perceptions and attitudes towards safety around parks. Of the 1,500 participants surveyed, most people felt that Gainesville's parks were safe, except for those with a lack of lighting or those lacking law enforcement patrols (Suau and Confer,

2005 in Maroko et al, 2009). Crimes occurring in Gainesville did not seem to have an effect on people's feelings of safety regarding parks though most of the crimes in this study took place further from parks and neither people's income, age, nor demographic information had any relationship to crime or feelings about safety at parks. Maroko et. al. evaluated the methods used in the Gainesville study and listed the discrepancies that may exist in the analysis of park access due to undercounted marginalized populations, miscalculation of access points to a park, park characteristics that may cater to a specific age group, and proximity errors. Errors and researcher's bias have the ability to skew results in any study, therefore it is expected that the study include the approach taken and discuss results appropriately (Maroko et al, 2009).

Fear of accessing recreational space can be rooted in knowledge about, or perceptions of, the frequency or severity of incidents occurring in or near a park's location. Incidents of assault, theft, and threatening behavior by individuals or groups can reduce the trust of legitimate users of parks, further increasing a "park's abandonment" (Hilborn, 2009). Evidence of other undesirable behaviors such as littering and vandalism can be interpreted as "visible signs of depreciative behavior" sometimes acting as a "gateway" for more serious offenses and possibly introducing feelings of fear to the community (Hilborn, 2009). Researchers in the Department of Criminal Justice at Temple University in Pennsylvania investigated parks as catalysts for crime. The study, "Role of Neighborhood Parks as Crime Generators", found that neighborhood parks in Philadelphia were "associated with increased levels of crime in the surrounding area" (Groff and McCord, 2011). Naturally severe crimes happening in or near open space

reduce people's legitimate usage, making parks more susceptible to abandonment and infiltration of unlawful activities. Significantly, parks offering more amenities had fewer incidents of unlawful activity (Groff and McCord, 2011). The study's authors recommended that, to rehabilitate crime-ridden parks, a community would need to add new facilities and legitimate user-drawing activities like organized sports leagues and events. Groff and McCord's findings that parks play an active role in influencing crime suggest that policy makers should monitor criminal activity around recreational areas and foster good communication with park visitors to see what improvements help prevent crime.

When unlawful incidents occur in public open space there are ways to strengthen community involvement and re-introduce a sense of authority or guardianship to shift a public perception of a park's safety from dangerous to welcoming. Suggested measures taken by community and city personnel to "take-back" public space include improved coverage by law enforcement of high-risk or problem parks, better maintenance and landscaping, cleanliness, inviting legitimate users of parks, and hosting events that present the park as having surveillance to deter criminal activity (Hilborn, 2009). Ongoing evaluation of parks would also help communities allocate resources necessary to promote positive park experiences and prevent criminal elements from deterring park visitors from accessing facilities. A web resource developed by The U.S. Department of Housing and Urban Development, U.S. Department of Transportation, and the U.S. Environmental Protection Agency, called Partnership for Sustainable Communities (PSC), encourages cities to evaluate the "Crime Rate in Parks and Recreation Areas" (OSEE, 2015). One

PSC suggested method of measuring access to open space includes investigating park areas with higher crime rates in neighborhoods with a higher percentage of children and people over 65 years old. Elders and minors are recognized as marginalized populations based on their lack of access to transportation including the inability to walk longer distances to parks. In the analysis of access to parks, each city will likely find differences in people's perceptions of their access compared to what data may be present, but currently there is no single standardized way of evaluating perceptions nor are there shared databases that could be used to conduct such analyses. Only communities or agencies with the funding and interest will likely commit to evaluating access to parks focusing on crime and demographic data.

Much research has been done regarding access to parks that incorporates crime data, surveys, and observation, but the previously mentioned collection methods found in the literature have yet to be applied to Patterson as a foundation for redevelopment and planning for future development. To analyze access to recreational open space in Patterson, California, this study uses Geographic Information Systems (GIS) and information collected through public participatory GIS (PPGIS) surveys to analyze information based on proximity, crime and physical barriers, and the statistical probability of incidents that may deter visitors of parks. Through these research methods I was able to assess the ways in which people travel to parks and analyze the community's access to recreational open space within the City of Patterson.

The results provided from survey participants in this study are consistent with the literature establishing what makes a park accessible including its distance from users,

amenities offered, park size, usability year round, appropriate vegetation, and safety considerations.

SITE DESCRIPTION

Nearly at sea level, Patterson is a small city in Stanislaus County, a little more than 3.5 miles east to west and 2.5 miles from its northern to most southern streets. Patterson is geographically located almost halfway between California's northern Oregon border and southern Mexico border and alongside Interstate 5 and Highway 33 in California's Great Central Valley. Like many communities in the Central Valley, Patterson originated along the railroad and from the subdivisions of ranches acquired in the 1800s. Sitting in the rain shadow of California's Coastal Mountains, Patterson receives approximately 12 inches of rain a year, experiences hot summers of over 90 degrees on average and mild winters with an average low of 38 degrees (City of Patterson, 2013). Patterson is known for its agricultural produce including almonds, walnuts, tomatoes, and especially its apricots and touts itself as the apricot capital of the world. Close to 1,000 people are employed "in the service and farm industries" (US Census, 2010). Patterson residents on average spend 41 minutes driving to work "and over 69% drive alone" (Gates et. al., 2012).

Between 1920 and 1987 the population of Patterson gradually increased to 5,000 and took another 10 years before reaching the 10,000 mark. When my family first moved to Patterson in 1991 there were fewer than 9,000 people living in the city limits. Over the next eight years the population held steady, increasing to only 10,386 by 1999 (City of Patterson, 2013). Between 1999 and 2007 the population swiftly increased to over 20,000 (Figure 1); double the reported population of 1999 (US Census, 2010). The population

growth was a result of the acquisition of agricultural lands that were rezoned into residential subdivisions (Figure 2). Residential property was proving more financially viable than sustaining agricultural farmland, especially for smaller family farms that were being approached by developers. During this rapid expansion, housing development took precedence over inclusive and thoughtful city planning. Rather than including Patterson residents and community members in discussions of properly designed outdoor space allocation and access for recreational activities, the development of recreational open

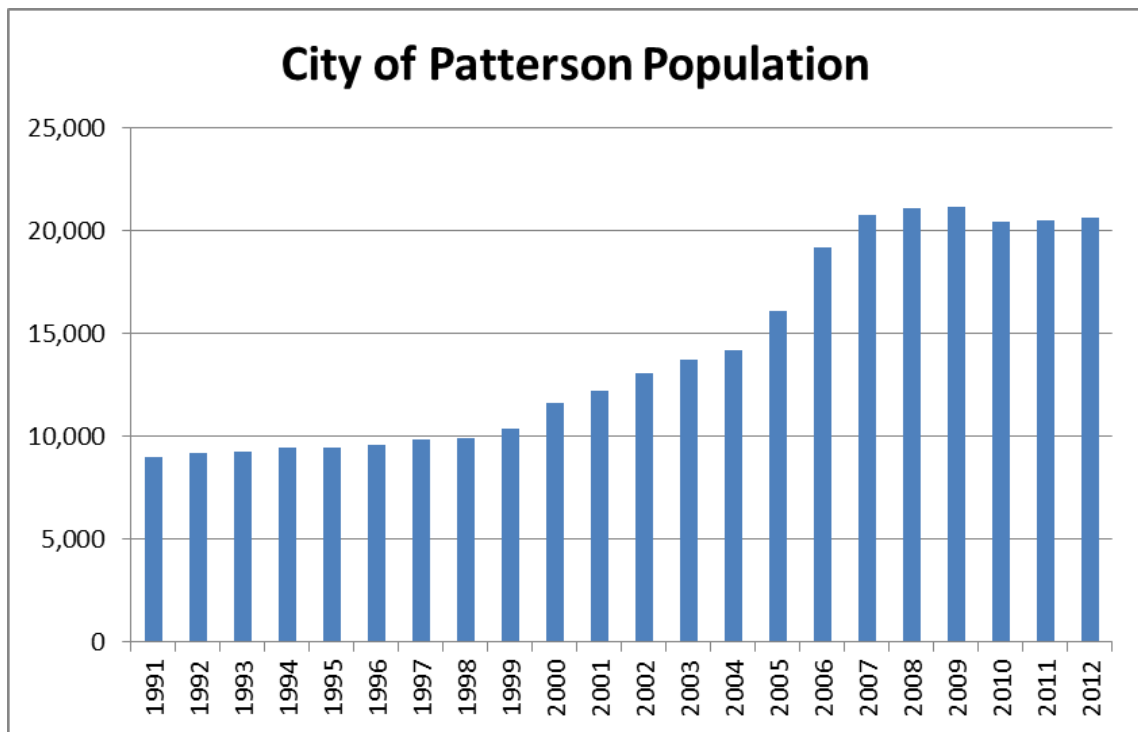


Figure 1: Patterson Population (City of Patterson and the California Department of Finance, 2014)

space was treated as an obligatory regulation by developers. 2010 US Census data identified 70 % of the households in Patterson were of ages 19 and under, and “Family Forming Adults”, ages 20-44, (Gates et. al., 2012).

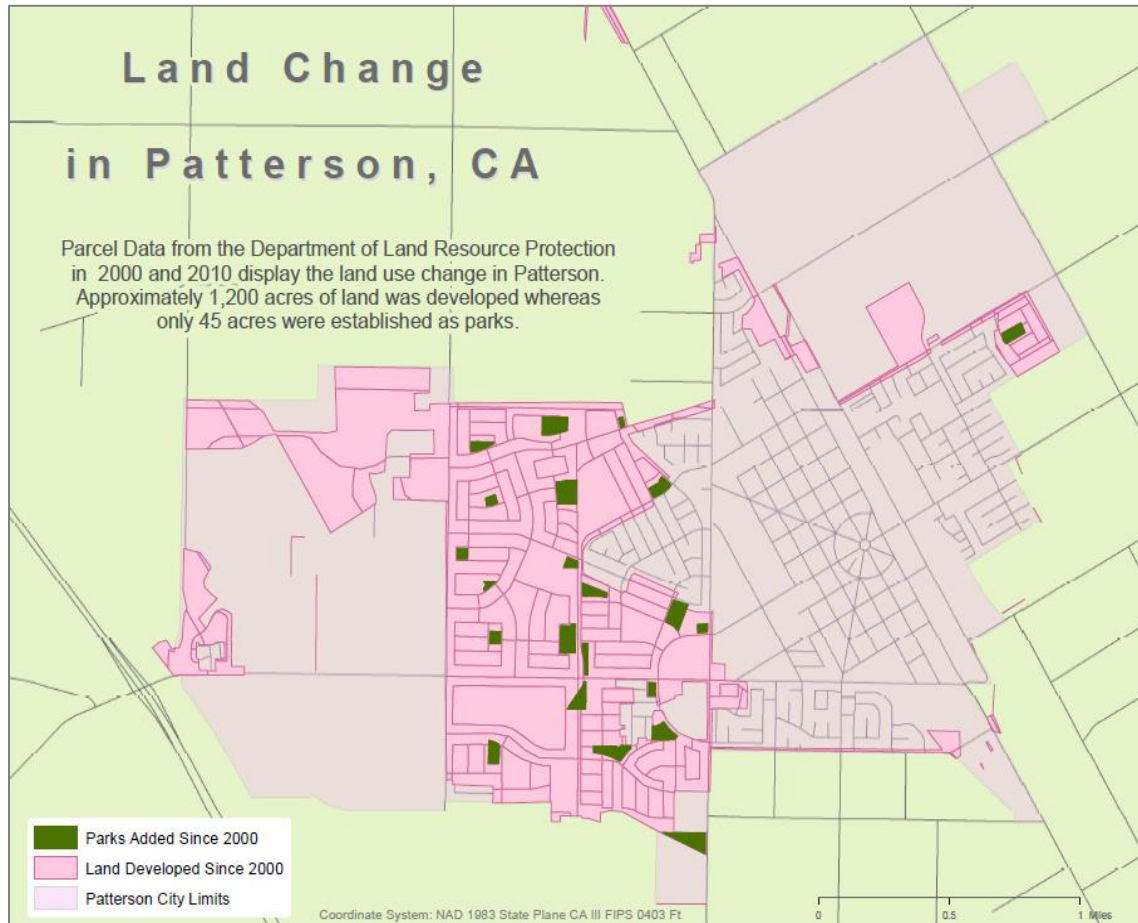


Figure 2: Land Change from 2000 to 2010 in Patterson, CA.

According to the 2010 U.S. Census, more than half of Patterson’s population identifies as Hispanic while the rest of population identifies as White, African American, Asian, American Indian/Alaska Native, and Native Hawaiian/Pacific Islander. People in poverty, where income is defined as households with an income of \$28,960 or below, are estimated at 18.6% of the total income earning households (U.S. Census, 2010). The

cultural makeup and needs of people living in Patterson are diverse. This diversity is both a challenge and an opportunity for the City of Patterson and the City has embraced some opportunities to be inclusive in its celebrations and programming of events.

Since 1970 Patterson has been celebrating its agricultural heritage by hosting the annual Apricot Fiesta which now draws close to 30,000 people and utilizes two downtown parks and streets radiating from the center of town to host the festival (Partridge, 2013). In the draft of Patterson's Parks and Recreation Master Plan dated October 2012, the total number of parks and facilities was recorded at 34. The size of Patterson parks ranges from less than an acre up to 12, for a total of 98 acres of parkland and facilities (Gates et. al., 2012). Due to the low elevation and proximity to the San Joaquin River, much of Patterson is located in a one hundred-year floodplain. To aid in diverting runoff and protecting neighborhoods from inundation, 20 of Patterson's 34 parks include storm water drainage basins. During winter months with heavy rain many basins fill completely with storm water runoff, rendering the parks useless for recreation.

Patterson experienced a significant amount of growth in both land development and population in just a few short years. Like many cities in California the population of Patterson is not likely to decrease, and the rate at which development will happen has been planned for the next 40 years in the City general plan to support an estimated population of over 60,000 (Gates et. Al., 2012). Periodic assessments by the City of Patterson including community surveys will ensure that shifts in the political, economic, and physical environment, will reflect current and future park needs of the community.

METHODS

This project evolved from an early proposal written to promote a greenbelt accessible to the community and residents of Patterson. Although I had the encouragement and support of some enthusiastic Pattersonites who also believed Patterson should reserve undeveloped land in the form of a greenbelt, the idea of designing a greenbelt and assessing feasibility was too large to see through to completion within the timeframe of this project. While considering recreational space and how land is currently reserved for outdoor activity I transitioned my study to focus on existing recreational space with regards to its adequacy for the current population. I wanted to know what people thought about the parks that already existed within Patterson and whether they felt they had reasonable access to them. But what is reasonable access; and how does one measure the quality and quantity of access to parks? I utilized both Geographic Information Systems (GIS) and public participatory GIS (PPGIS) and individual surveys with interviews to collect, manage, and analyze data to determine people's access to parks in Patterson. GIS is the collection, storage, maintenance, and output, of spatial information (Steinberg, 2006). PPGIS is the collection of information in an inclusive public setting which contributes to the maintenance, analysis, and output of spatial data (Steinberg, 2006).

GIS Data Collection

Data collected for the GIS portion of this study originated from online sources and personal observation and then stored and analyzed using ESRI ArcGIS10. Internet resources used for boundary and parcel data of the City of Patterson study area include the United States Census, State of California, Stanislaus County, City of Patterson, the Patterson Irrigator websites, and collected viewing 2010 Bing Aerial imagery in ArcGIS10, and Microsoft imagery in CityGIS. The map outputs were projected to NAD 1983 State Plane CA III FIPS 0403 Ft coordinate system (Table 1). GIS layers and population information were collected from free internet sources, readily available to the public, so that similar studies could be done with up to date census and incident data and recreated in other communities. Interactive internet tools outside of the GIS software were used such as the function of Street View through Bing Aerial imagery, which aided in the remote observations of many physical barriers, but as the imagery was dated, in-person recording of some locations was required. In-person observation was used to both confirm data that was referenced and downloaded from internet sources as well as to collect additional geographic and qualitative information not available remotely.

Table 1: Data Sources

Data Layer	References/Data Sources
City of Patterson Base Map	http://gis.stancounty.com/giscentral http://conservation.ca.gov/ http://portal.gis.ca.gov/
Incident Data	http://pattersonirrigator.com/
Parks Location	Bing aerial imagery Arc GIS10 CityGIS: http://digimap.com/ Personal observation

Data Layer	References/Data Sources
Population	United States 2010 Census: http://census.gov/

Several photographs were taken to record physical barriers in support of the GIS results (Figure 3). Physical barriers to parks such as streets lacking both sidewalks and bicycle lanes, busy streets with a speed limit over 25mph, and irrigation canals were identified in both aerial imagery and personal observation for accuracy.



Figure 3: Photograph of a cyclist riding on a busy Patterson street

Block level population data from the United States 2010 Census, for the City of Patterson, was entered into the GIS to look at people's proximity to parks. The Buffer Tool was set at a .25 mile radius surrounding parks, which is a preferred walking distance to parks and standard set by the Quimby Act (276 CA. Rev. Code Sec 6647). The people living within this buffer were categorized as having high access to parks. People over the age of 65 and minors under 18 are some of the most vulnerable of the population and the

focus of the proximity analysis. Children without consistent access to transportation may require assistance to utilize amenities and often need supervision when visiting parks; and as people get older they may not be as physically stable to walk on grassy or unpaved paths, and walk shorter distances. These special considerations take into account how far a person must walk if a motorized vehicle is not available.

Crime and traffic incident data were more time consuming to collect, but vital to the study as potential barriers to parks. Originally I requested crime/traffic data from the Patterson Chief of Police, but due to budget cuts and limited availability of city employees to assist me, the local newspaper, The Patterson Irrigator, was the best resource. Over 300 crime and traffic related incidents between January 1, 2011 and March 15, 2012 were collected from The Patterson Irrigator website police log, about 30% of the total reported incidents that occurred in Patterson during that time frame (Table 2). Incidents forwarded to the newspaper police log fell into at least one the seven categories of serious crime: Homicide, Forcible Rape, Robbery, Assault, Burglary, Theft, and Auto Theft (Rappley 2013). The total number of crime and traffic related incidents that were reported to the police department in Patterson in 2011 were 815 and 921 in 2012 (Rappley 2013).

Table 2: Sample Police Log from the Patterson Irrigator Website

Police Log Date	Incident Details
Posted: Thursday, March 15, 2012 12:00am. Incident on: March 13	400 Blk S 2 nd St. A Commercial burglary occurred where forced entry was made through a fence on the 400 block of South Second Street. Surveillance cameras were taken.
Posted: Wednesday, February 8, 2012 12:00am.	2:17 p.m.: Name Removed, 31, of Patterson, was arrested on suspicion of carrying a concealed dagger, possessing a

Police Log Date	Incident Details
Incident on: Feb 5	controlled substance and drug paraphernalia, and violating probation near the corner of East Las Palmas Avenue and Highway 33.
Posted: Thursday, February 2, 2012 12:00 am. Incident on: Jan. 28	8:12 a.m.: A 1996 Honda Civic was stolen from the 600 block of Berlin Way.

Incidents reported on the website listed the location, type of incident, date and time, details of the occurrence, and often specific names were given of those involved. To ensure confidentiality in the database I created, the names of individuals were omitted from the data collection and any reports giving specific addresses were generalized to a block location. Each incident, including child endangerment, warrants, assault, car theft, battery, possession of illegal substances, and drunk in public, were catalogued in a table of five categories: assault, burglary/theft, traffic, illegal substance, and unlawful activities (Table 3). Approximately 10 incidents during the 2011-2012 time frame were omitted from this data collection as no geographic reference was provided. All other incidents in the log referenced an exact address or were pre-generalized to the block level.

Table 3: Incident Categories

Category	Incident Type
Assault	Gun shots, battery, assault, warrant, child endangerment, resisting arrest
Burglary/Theft	Burglary, car theft, vandalism, bullets hitting property, breaking and entering
Traffic	Drunk in public, disturbing the peace, forging vehicle registration
Illegal Substance	Possession of paraphernalia, alleged use
Unlawful Activities	Contributing to the delinquency of a minor, false emergency reporting

Each incident was digitized to a polygon within the GIS to cover an area approximately the size of a residential block. By associating all of the incidents to a generalized location, anyone looking at the map results would not be able to connect an individual home with a particular incident. Using the “feature to point” tool, a central point was generated within each incident and park polygon to make statistical analysis easier. The “collect events” tool created a weighted point for each incident, based on the number of occurrences at that location. The next step was to create a hot spot analysis displaying the range of occurrences from hot-cold with the newly generated weighted points. Hot spot analysis uses statistics to identify locations based on significance and displayed based on high to low values (ESRI, 2016). The distance threshold of the hot spot analysis was changed to ¼ mile to be consistent with the walkability of nearby parks and the map output displaying access by proximity. With the types of incidents provided, a predictive model would best make use of the data and show what parks would most be affected by crime/traffic incidents in the future. Using ordinary kriging with validation prediction at the third order trend removal, a continuous surface was created to show the predicted incident values for parks. A spatial join of the predicted incidents was connected to the original parks feature class which then was selected based on the highest number of predicted crime/traffic incidents.

PPGIS Data Collection

The participatory element of this project incorporated a basic map of Patterson with two different types of survey questions that could be answered by children of grade-

school age and adults, and available in both English and Spanish (APPENDIX A). The GIS department at HSU printed a 35" x 47" map of Patterson for participants to draw on and write comments about their experiences with accessing parks (APPENDIX B). Developing questions to ask the Patterson community required investigation into other similar surveys. In 1995 the City of Turlock, about 16 miles from Patterson, conducted a survey about parks among its residents for the evaluation of its current parks and to collect ideas for future parks. The Turlock survey asked people to rank specific amenities by preference which was too leading for the purposes of the Patterson study (City of Turlock, 1995). To prevent bias in my survey the questions were open ended which enabled people to provide answers that were most relevant to them. In my survey I used a map designed to encourage respondents to label the parks they visited and to show how they accessed parks. In the survey for minors I left room for the children to draw a picture of what the word 'barrier' meant to them. I hoped that collecting these images from children might convey a sense of what it feels like to experience barriers from a child's point of view.

To reach a diverse portion of the population with respect to age, gender, and interest in parks, the public participatory aspect of this project was executed through two City sponsored events, an after-school youth program, and a coffee shop operating in downtown Patterson. The first of two outdoor participatory sessions was held at the Senior Center and office for the Parks and Recreation department where the City hosted its second annual Earth Day event (APPENDIX C). On April 21, 2012 residents and people working and living in the area helped plant flowers and clean up trash around the

center of town and at the Senior Center. Seeing the event as an opportunity to survey members of the community interested in Patterson parks I placed an advertisement published the week of the event in The Patterson Irrigator. Since many residents and businesses subscribe to the weekly printed newspaper, I also commissioned an HSU Student to translate my advertisement into Spanish (Figure 4). The turnout for both the Earth Day event and my survey was very low. Only about a dozen people participated in my surveys and a handful of people were interested in drawing on the large map of Patterson. Low turnout for the Earth Day event may have been due to the many residents of Patterson who leave town to shop or enjoy amenities in larger neighboring cities on weekends, and that the event and its activities was not well publicized.

**Community Mapping Project:
Accessing Parks in Patterson**

Community members living, working, and recreating in Patterson are invited to participate in a study investigating how parks are accessed in Patterson. Surveys and mapping sessions will be held at the Earth Day event on April 21st in front of the Senior Center from 8:30 am-12:00 noon. Participants have the opportunity to voice their input on how parks are accessed and point out barriers that prevent people from accessing parks in Patterson. Translators may be available upon request.

For questions regarding the project please contact Principal Investigator:
Leanne Lynch
Ph. 209-505-8806
e. lsl21@humboldt.edu

**El proyecto para trazar
un mapa de la comunidad:
El acceso a los parques en Patterson**

Los miembros de la comunidad quien está viviendo, trabajando, y participando en el recre en Patterson son invitados a participar en una estudio para investigar los parques accedidos en Patterson. Las encuesta y las sesiones del trazar un mapa van a ocurrir en el evento de Earth Day (el día de la planeta tierra) en la fecha de Abril 21 en frente del Senior Center (el centro para los de mayor edad) en las horas de 8:30am-12:00pm. Los participantes van a tener la oportunidad para dar voz a sus opiniones sobre el acceso de los parques y enseñar los impedimentos que prevenir el acceso a los parques para la gente en Patterson. Los traductores son disponibles a solicitud.

Las preguntas sobre el proyecto pueden ser mandados a la investigadora principal:
Leanne Lynch
Ph. 209-505-8806
e. lsl21@humboldt.edu

Figure 4: Advertisement created for The Patterson Irrigator

Every year Patterson celebrates its agricultural heritage with a three-day festival featuring craft and food booths, a petting zoo, live music, and activities for people of all ages. Once famous for being the apricot capital of the world, Patterson continues the tradition of a fiesta where thousands of current and previous residents mingle and reminisce about times in their youth. Seeing this as an opportunity to reach a greater number of possible participants of all ages, I held the second PPGIS session at the Patterson Apricot Fiesta the first weekend in June, 2012 (APPENDIX D). As my booth was not selling goods or services I was able to secure a spot in the designated “free speech” section of the fiesta. Located conveniently near a bank ATM, my booth had an open layout with shade, only one canvased back wall, and the large map of Patterson displayed in front of the table and chairs set out for participants. One of the restrictions of having a booth in the free speech area was that I could not solicit participants from passersby which limited my ability to attract additional people. Approximately 20 adults and 5 children participated in the written survey and map session while two people gave verbal accounts of their opinions on access to parks.

The two in-person events and classroom surveys produced 32 viable adult responses and 15 surveys from children. The only obligation of survey participants was that each adult participant complete a consent form, or if under the age of 18, the minor would have a parent or guardian complete a consent form. Both surveys for minors and adults requested that participant identify themselves by gender and indicate on the map located on the backside of the survey what neighborhood they lived in, but while children were asked for an exact age, adults were asked to choose from three age ranges. The final

question on the minors' survey asked the participant to draw what they thought of when they think of the word barrier. Adult participants were asked to label barriers on the large participatory map, but the remaining questions were the same for children and adults.

Using the tallied results of the paper surveys I was able to generate a map within the GIS to demonstrate which parks were visited the most frequently by adults and minors and compare these with the map showing which parks were likely to have crime/traffic incidents as barriers.

RESULTS & DISCUSSION

Raw GIS data and all database tables created in this study, including any output of analysis like generalized georeferenced points within the city of Patterson, written details of each crime and traffic related incident, and all associated metadata were lost during a burglary of my home where my computer, and all external hard drives were stolen. Therefore additional analysis of the GIS data collected was inhibited. All that remains with regards to the collection, maintenance, and analysis of data for this project has been retained in printed documentation and electronic images shared previously in classes through the HSU Moodle interface and reports that were sent via email where a correspondence had been saved. Attempts made to recover the stolen data and computer were unsuccessful, however, I am grateful that the completed surveys could aid in the interpretation of results and completion of this study.

GIS Results

The first series of analyses evaluated people's access to recreational open space based on proximity to parks, location of crime and traffic related incidents, and probability of future incidents near parks. Each GIS analysis produced a new map revealing levels of accessibility and types and locations of barriers to recreational open space in Patterson. The initial analysis evaluating access based on proximity revealed which neighborhoods within .25 miles of a park and having either a bicycle lane or sidewalks on either side of the street were found to have the highest access to parks

(Figure 5). Some locations within the .25 mile radius, had barriers interrupting the most direct route to parks such as missing sidewalks, a lack of bicycle lanes, or canals and fences shifting those areas from having high to low access to parks. The total population with low access to parks was 6,883 or 28%. Of that population 2,132 were minors under the age of 18, or 26.5% of children. Approximately 41% of the population over 65 years old had low access to parks. Focusing the analysis on the population of children under 18 years old and adults over 65 illustrates the need for diverse, safe, and direct access to parks. Children, seniors, and people who use medical assistive equipment are a part of the population with less independent access to vehicles and often need more access to non-motorized transportation methods like walking, bicycling, skateboarding, wheelchairs, walkers, canes, and short-distance motorized scooters. In neighborhoods established before 1990 there were several streets where sidewalks were broken from tree growth, disconnected, or did not exist. Alleys behind these houses were not typically paved and therefore, families with strollers or persons in motorized chairs often had to travel in the road, typically around parked cars.

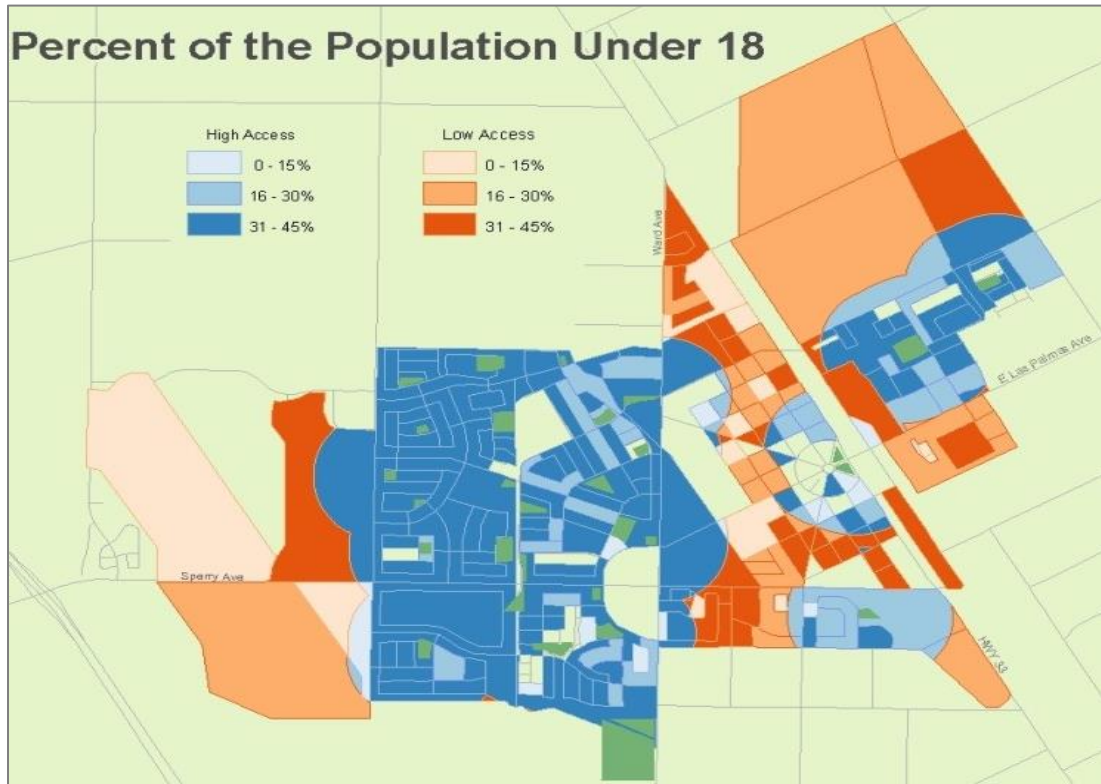


Figure 5: Map of Patterson showing high to low access by proximity

Results identifying areas in Patterson the furthest distance from parks did not include neighborhoods a block away from a park, but still affected by unseen barriers such as crime and safety concerns, which would then cause low access. Analyzing categories of the locations of illegal activity and traffic violations identified parks affected by the highest number of those incidents. A sample of crime and traffic incidents located in a generalized area over a year is shown in Figure 6. The map in Figure 6 displays a possible geographic range where each incident might influence a neighborhood's access to a park and only two parks were outside of the incident affected area. The map displays neighborhoods and parks in Patterson that were unaffected by

crime/traffic incidents, though access to the majority of parks was affected (Figure 6). However, some of the mustard-colored polygons actually overlapped and combining those incidents and displaying their number by census block altered the area of influence incidents may have had around each park (Figure 7). In Northeast Patterson there were several blocks where a high number of incidents were reported surrounding Garza Park; the largest park in that area of Patterson. Garza Park served several neighborhoods within a quarter mile radius, but with the high number of incidents reported, residents might have been less likely to visit this park. Therefore people within the quarter mile proximity actually had much lower access than previously noted.

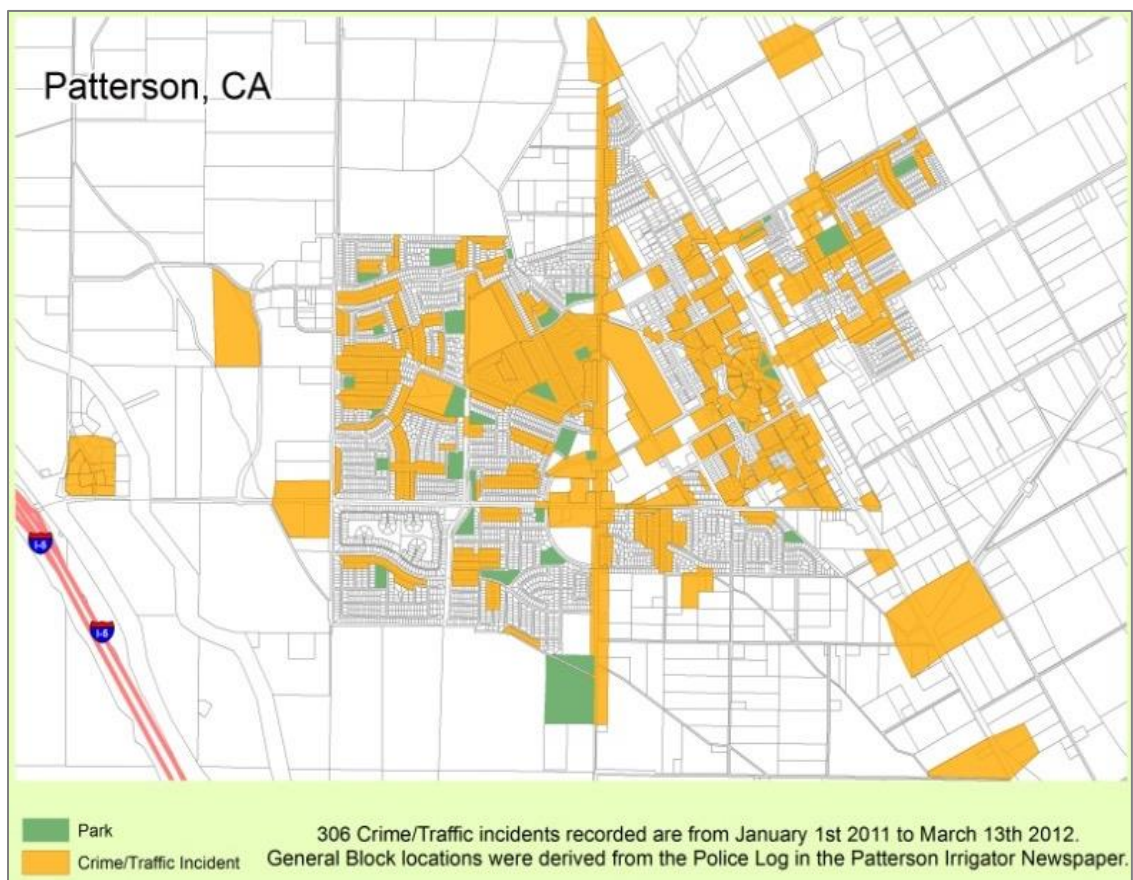


Figure 6: Generalized location of crime and traffic incidents in Patterson, CA

Creating a centroid of each generalized polygon produced a map locating each recorded incident, colored-coded, based on type (Figure 8). Red signifies all incidents categorized as assault which may be the greatest deterrent to accessing recreational open space. Crime was reported near almost every park, though a high density of incidents in the older neighborhoods indicate more crime occurred in areas with fewer parks. Not all incidents reported occurred in census block areas, but rather in shopping centers or on

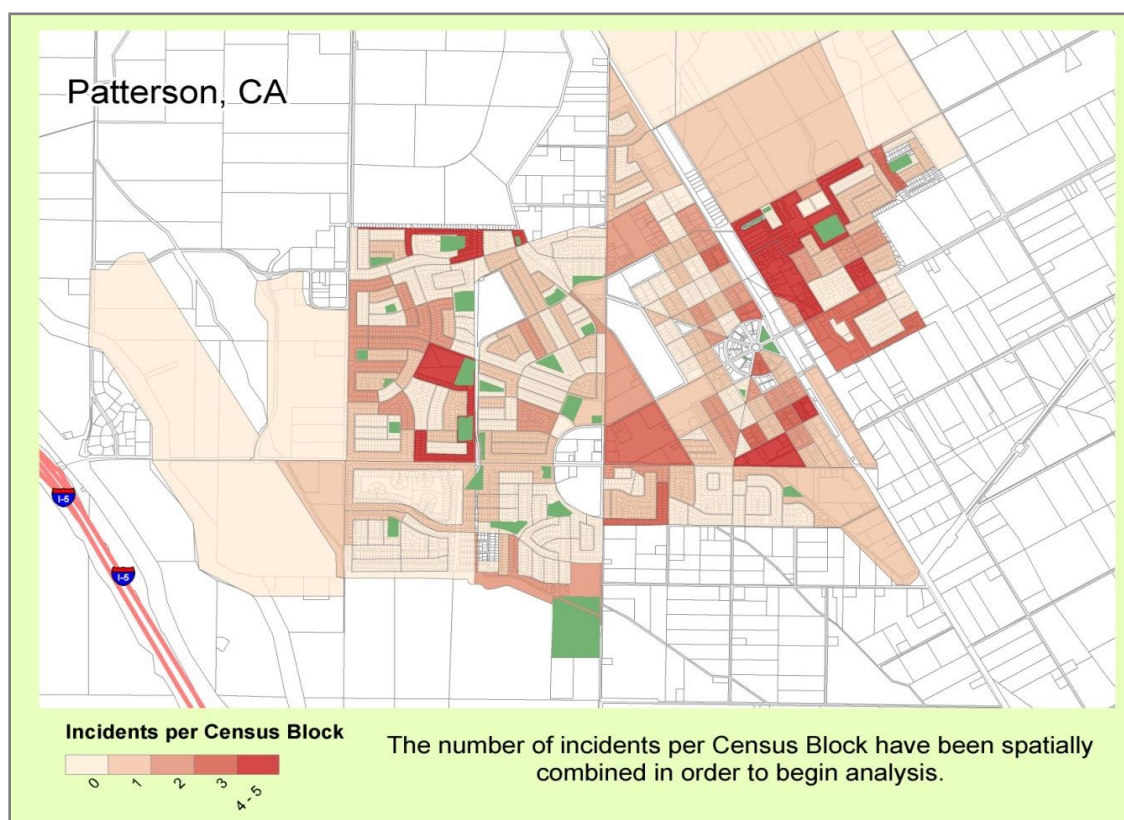


Figure 7: A choropleth map displaying the number of crime/traffic incidents per census block

busy streets, so locations of these incidents may not have been accounted for in the analysis based on census block. A hot spot analysis took each reference point and

indicated where the highest to lowest cluster of incidents occurred around the city without regard to the census block and the results of these clusters were used to predict which parks were likely to have incidents nearby (Figure 9). Parks with the highest likelihood of incidents were identified due to the spatial relationship between nearby incidents. The affect these incidents had on access to parks will be discussed in the PPGIS survey results.

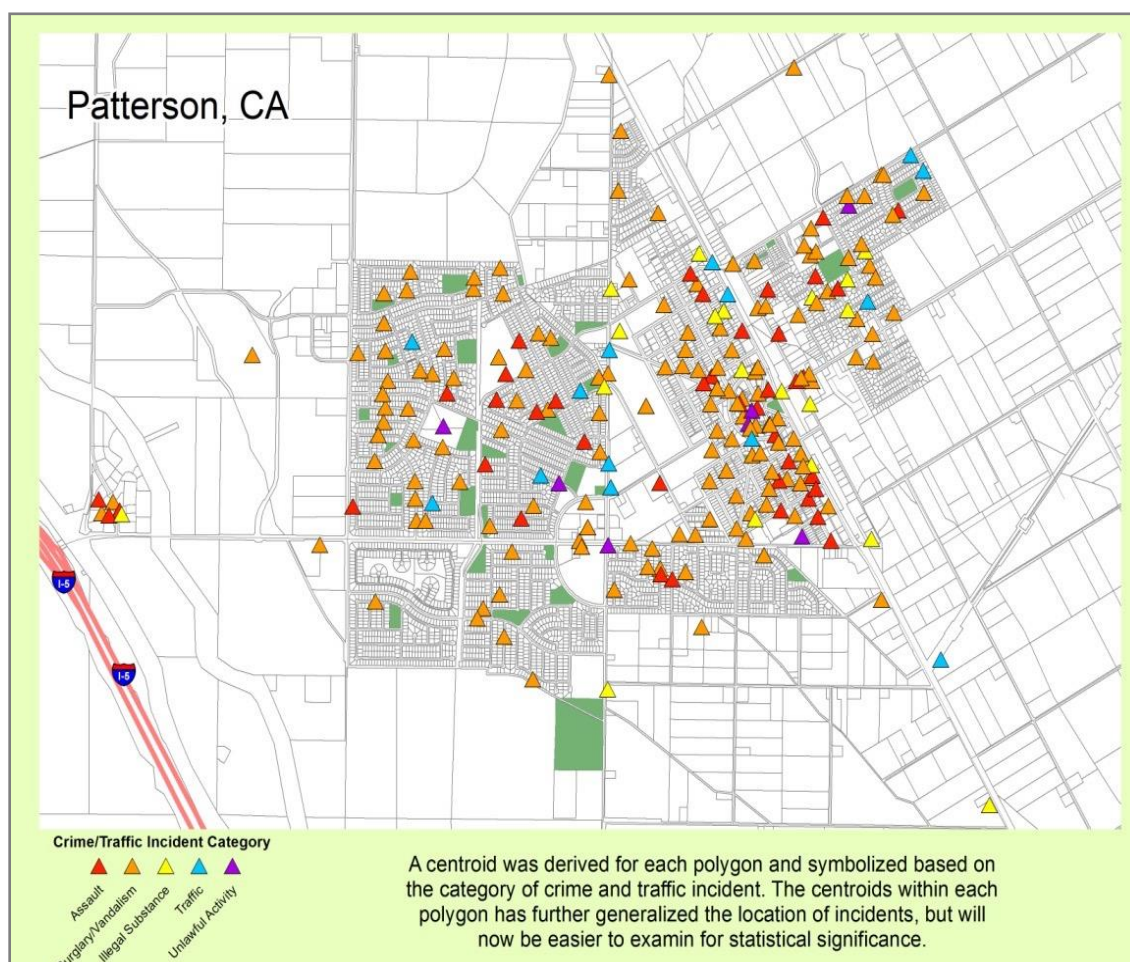


Figure 8: Crime and traffic incidents reported by category

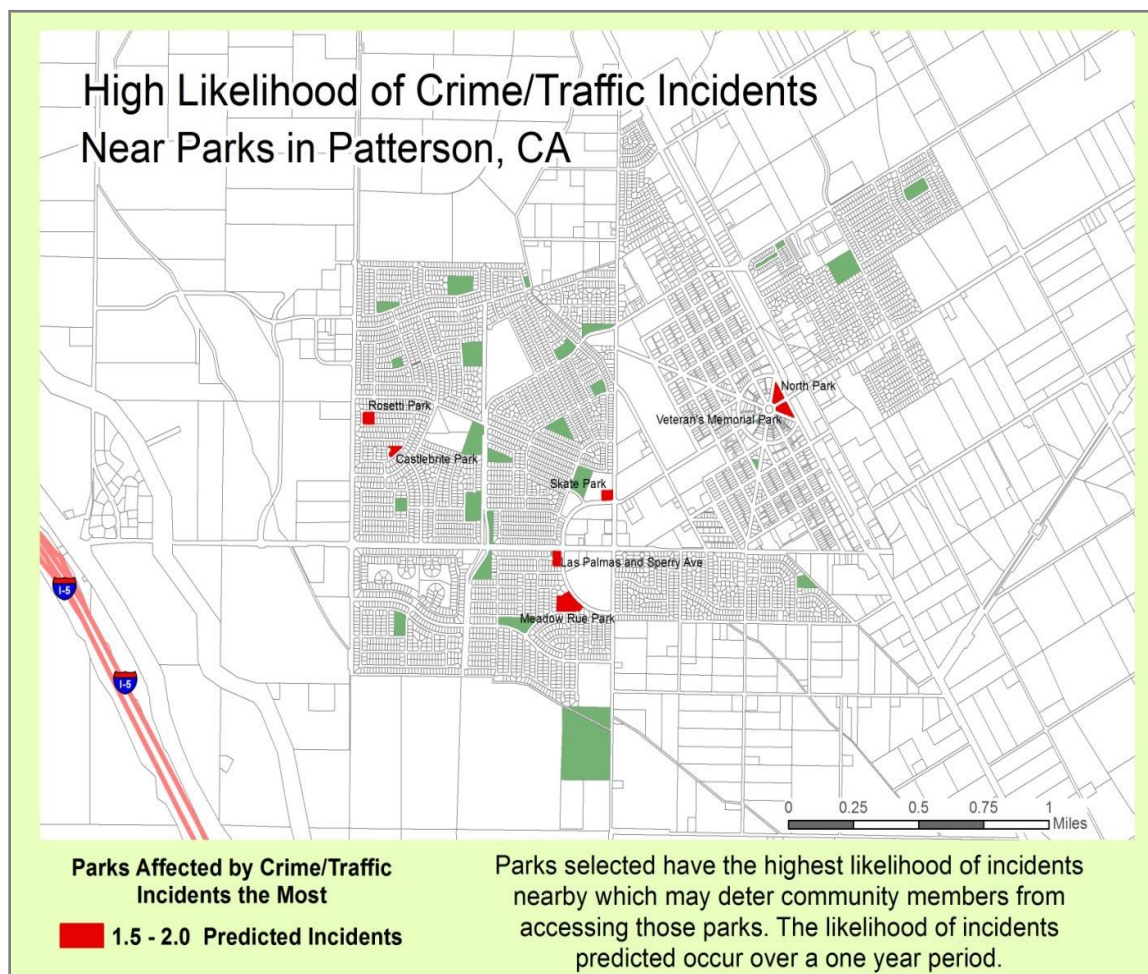


Figure 9: Parks most likely affected by crime/traffic incidents

PPGIS Results

Respondents of the PPGIS portion of this study provided a range of answers that were tallied by age group (Table 4) and each of the top responses were compared for similarities (Table 5). Parks with amenities described as those most preferred correlated with the parks chosen as those most frequented on the back of each survey. A significant contribution to the survey questions were the drawings by minors (Figures 10-14).

Table 4: Sample of tallied survey results

Method of Travel	Minors (15 Surveys)	Adults (30 surveys)
Car	7	22
Walk/Run	5	24
Bicycle	4	10
Skate/Rollerblade/Scooter	2	3

Table 5: Top three survey responses for minors and adults

Survey Topic	Children Top Three Choices	Adults Top Three Choices
Method of travel to parks	1. Car 2. Walk 3. Bicycle	1. Car 2. Walk 3. Bicycle
Activities enjoyed at parks	1. Playground equipment 2. Play with pets 3. Play sports	1. Sports 2. Play with kids 3. Parties/Picnic
Barriers/challenges that make it difficult to visit parks	1. Parents 2. Too busy 3. None	1. Gang activity 2. Distance 3. Lack of shade/heat
What prevents visiting the park more often	1. Gangs 2. School 3. Too far/need ride	1. Time/busy 2. Gangs/drugs 3. Lack of shade/weather
What features would you design into a park	1. Sport specific fields 2. Water park 3. Bigger playground equipment	1. Better pathways to parks 2. Shade 3. More/better playground equipment

Drawings by the children varied from images of busy streets, school work and chores, fences and walls, and the more concerning images of gangs, bullies, and drugs. Five of the surveys completed by minors that mentioned concerns of safety as barriers,

frequented parks where a high number of crime incidents were reported, and all lived within a half mile of Ambercot Park near Creekside Middle school in the Northwest area of Patterson. Three of those five surveys specifically mentioned gangs and drugs. Three minors living in the Northeast area of Patterson drew pictures of cars as barriers to parks which compared to the concerns of adults regarding traveling to parks in West Patterson to avoid the gangs and drugs witnessed around Garza Park. Both minor and adult participants indicated safety and cars or distance as being barriers to parks visited some of the same parks and lived in similar neighborhoods.

The most common responses of minors when asked what barriers/challenges made it difficult to visit parks were family members and parents, indicating home responsibilities and dependency on adults for transportation. Surveys were distributed to children during an after-school program by an instructor. Had I been present, I would have asked the child why he responded to four of the 9 questions that he did not go to parks though colored in the skate park as one of the locations that he visited (Figure 11). The interpretation for his response could have been either his preference of only visiting the skate park, or his facing other barriers that may not have allowed him to visit other parks. While collecting information during a visit to Patterson, I witnessed some older teens smoking in front of the youth and senior centers across from the skate park. Although a group of teenagers smoking may seem like a minor issue to an adult, the same group might intimidate or influence a child in a way that prevents the child from accessing the park.

Por favor dibujar que piensa usted cuando escucha la palabra *impedimento*.

Minor: participant with consent

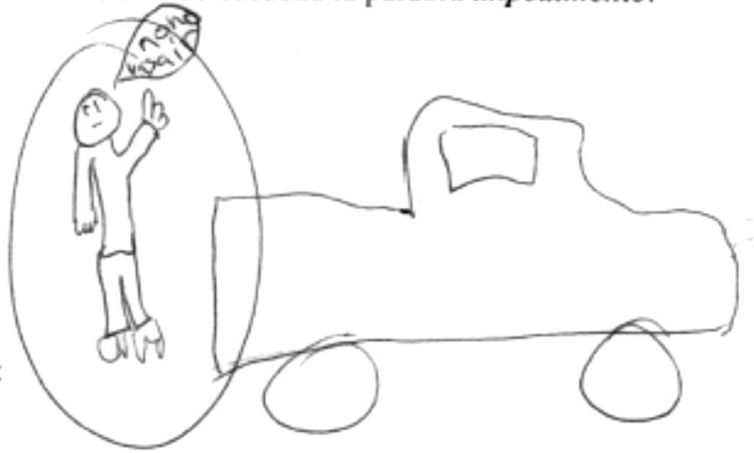


Figure 10: Drawing by a 12 year old boy of a truck and a person speaking in Spanish

Draw a picture of what you think of when you hear the word *barrier*.

Minor: participant with consent

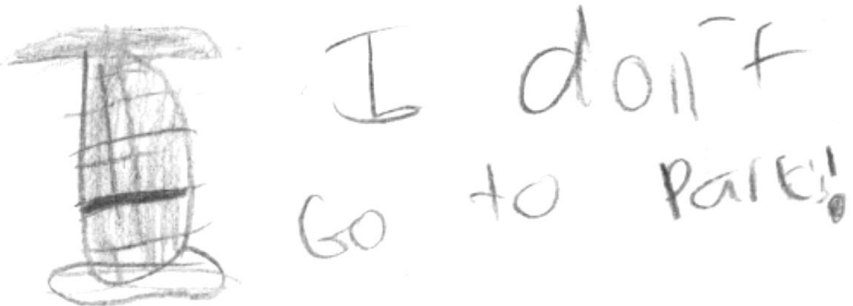
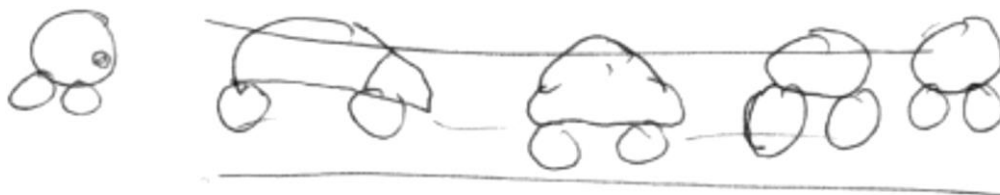


Figure 11: Drawing by an 11 year old boy of a fence, "I don't go to park!"

Draw a picture of what you think of when you hear the word **barrier**.



Minor: participant with consent

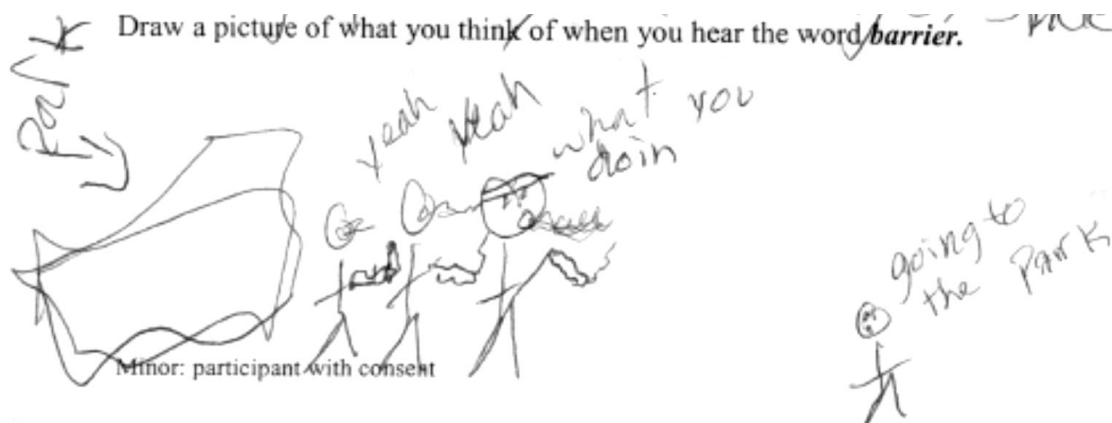
Figure 12: Drawing by an 11 year old girl of a street busy with traffic

Draw a picture of what you think of when you hear the word **barrier**.



Minor: participant with consent

Figure 13: Drawing by a 10 year old girl of a bully, litter, and person smoking



Minor: participant with consent

Figure 14: Drawing by a 10 year old girl of her being approached by a gang as she walks to the park

The two 10 year-old girls who drew pictures of people smoking (Figures 13 and 14) circled that they lived in neighborhoods around and frequented Floragold Park, a park that had a high number of incidents per census block (Figure 7).

As the final prompt in the survey, adults were asked to supply additional thoughts on access to parks not addressed in their previous responses. Several respondents mentioned the need to host more events at parks, increase security, and improve amenities and park features such as lighting, filling divots in the grass which is a safety concern for people playing sports or walking, adding vegetation to attract visitors, and having accessible bathrooms, so that people can enjoy parks for longer periods of time. The lack of preferred amenities at parks and concerns of safety, were identified as the leading concerns. One of the most common complaints given during the PPGIS survey for why people wouldn't visit Garza Park in Northeast Patterson was the constant threat of theft and gangs. Families considered safety when deciding which parks to visit. Parks where people feared crime or illegal activity were not as likely to be visited as those that elicited feelings of safety, most often located across town. Although some parks were designed with people's preferred amenities, they were lacking accessible public restrooms, which limited the amount of time people reported spending visiting these parks.

Interviews

While collecting surveys from community members, some participants offered personal experiences about how they accessed parks in Patterson. The following section includes the narrative of those interviews.

One participant of the Earth Day event was a father with three children who all enjoyed riding their bicycles to the sports complex from home. Although the family lived less than a quarter mile from the park, the father would drive his family because of the untethered dogs that had previously chased them down country roads leading to the park. The father felt that the short bicycle ride wasn't "safe" because his kids were too young to out-pace the running dogs. Another concern the father had was that the bathrooms were not consistently opened at the park, which limited the length of time the children could play. When asked what he would like to see added to improve the sports complex, the father mentioned his interest in playing horse shoes, but that the only pit in town was at the North Park which wasn't as close to his home as the sports complex.

An older couple that lived in the north eastern side of town, just outside of Patterson City limits, said they had farmed in the community most of their lives and in retirement had been enjoying their participating in community events and gardening club functions. The couple said they would like to enjoy riding bikes together in their old age, but there weren't any bicycle trails safe or pretty enough for them to want to do it. They mentioned how there was very little incentive for them to go to any of the parks in town unless there happened to be a special event like the Earth Volunteer Day. Without shade, benches, nice walkways, or flowers, the couple said they'd rather walk around their small property than make a trip to one of the neighboring parks. When I asked what would

make them want to visit the parks more often, the gentleman responded: “Each park should be themed and connected with pathways so people can safely travel from one park to the next. A greenbelt should surround the city and allow people to ride bikes or walk without being bothered by traffic.” He said that if the community had a say in what each park had to offer, then they’d want to visit them more often. He also said that music is an important part of the community and that there should be music festivals of every genre like: Latin, country, blues, rock, and music that kids can relate to and get people outside and away from their electronics at home.

One of the last participants during the Earth Day event was a grandfather living close to Garza Park and even though he worked in Patterson and had lived in the community a long time, he didn’t feel comfortable taking his grandchildren to Garza due to gang activity. He said he was worried about the shootings audible from his neighborhood and the persistent drug problem in the blocks surrounding the park. The grandfather said he had to take the kids to nicer parks on the other side of town where he doesn’t have to worry about gangs and the children would have more options as far as playground equipment and other children to play with. When I asked him for suggestions to help solve the problems surrounding the park and to increase park usage the participant felt that additional police presence would help in a small way, but removing the farmworker labor camp next to the park would be the best option.

During the Apricot Fiesta a woman who mentioned a preference to walk her dog close to home said she couldn’t walk on the grass at the park closest to her because of divots in the grass that had previously caused her to twist an ankle. Unable to enjoy the

company of people playing near the playgrounds and on the grass, for safety, she was restricted to walking only on the level pavement of the sidewalks surrounding the park. The woman said she'd love to have meandering paths and pretty flowers to look at with more trees and places to rest along the way. Before thanking me for the opportunity to take the survey, the participant said that if she could see these changes before she's too old to walk alone, she'd be very happy that the City had taken residents' suggestions.

One participant was a gentleman in his 80s who opted for an informal interview in lieu of participating in the survey. The man was seated in an electric scooter, and though he considered himself limited in his mobility, enjoyed making trips across town and felt lucky that he had a vehicle enabling his interactions with the community. Using the survey as a guide, I asked the man if he encountered barriers that kept him from accessing the parts of town that he frequented. As the participant mentioned living in the South of Patterson, near Poppy Ave, he said his scooter would only take him as close as three blocks from the center of town before he would have to stop and charge the scooter battery at a local business. He also said that before leaving the fiesta in a couple hours his scooter would need to be charged at least one more time, so he could make it home. When asked whether he found time to visit any of the parks in Patterson the participant said he would like to, but that he couldn't guarantee there would be a place for him to charge his scooter, so he didn't go to them with the exception of the North and South Parks during the Apricot Fiesta. The man further added that if there was a guaranteed power source for him to plug in his scooter, he would visit the Sports Park the most

because it was a shorter distance to his home than the other parks and he would enjoy watching the people.

A man and his two nieces and nephew filled out the survey on my second and final day at the Fiesta. The children were between the ages 6 and 10 and eager to share their points of view on what seemed like a very important issue to them. One of the children expressed an interest in designing a park with cloth-like shade across the playground so that the equipment didn't get too hot to play on (a sentiment shared by many parents). She drew a structure three tiers high with a ladder and longer slide for older kids her age and said that instead of bark or sand she would put tire pieces so that her hands and feet wouldn't get splinters or get too hot like at other playgrounds. The second youngest child expressed an interest in having different kinds of equipment to play on or hide around for when he went to the park with his friends. He also said he'd like it, if all of the parks had every kind of field including: soccer, baseball, football; so that when he felt like playing a particular sport, he would be able to. The youngest child said she just wanted to go to the park more often. The uncle wasn't as interested in the survey as the kids were, but said he would like to see more picnic benches and BBQ pits at some of the larger parks for when the family got together.

Finally, two mothers with four children collectively expressed the need for more toddler-friendly playground equipment and shade to keep the equipment from getting too hot. Both parents shared disappointment that the bathrooms were either locked or non-existent at most of the parks, which kept their visits short. As much of the late spring, summer and fall months of Patterson can be very hot, the mothers discussed how

uncomfortable some of the family would get without working drinking fountains and having a lack of benches to sit or eat at. Sunflower Park was named specifically by one mother as needing several improvements. Doubling as a storm-water basin, the acre sized Sunflower Park was closest to her home, yet hardly accessible and surrounded by a chain link fence, where the gate providing the only access point, was often locked. Amenities offered at the park were a tetherball pole and basketball hoop, each sitting on their own slab of concrete and surrounded by rough crab grass and goat heads, a bicycle tire-popping plant. Without shade, playground equipment, benches, bathrooms, or a water fountain, the mother could hardly call it a park at all. When asked what made a park desirable and enjoyable both mothers agreed that consistent hours of availability, adequate playground equipment for all ages, and clean and open bathroom facilities determined what park their families would drive to.

GIS & PPGIS Comparison

A comparison of the PPGIS surveys and GIS analysis indicated parks having a higher likelihood of crime or traffic incidents were visited more frequently by children than adults (Figures 15-16). Since many children are restricted to visiting parks they can easily travel to, most children mentioned visiting parks close to where they lived, while adults mentioned visiting parks further away. Minors and some of the participants over the age of 65 identified distance as a major barrier to traveling to specific parks. Though the sample population participating in this study mirrored many of the expected challenges and barriers to parks, including survey results from a greater number of

community members might produce additional perspectives on access to parks not yet identified.

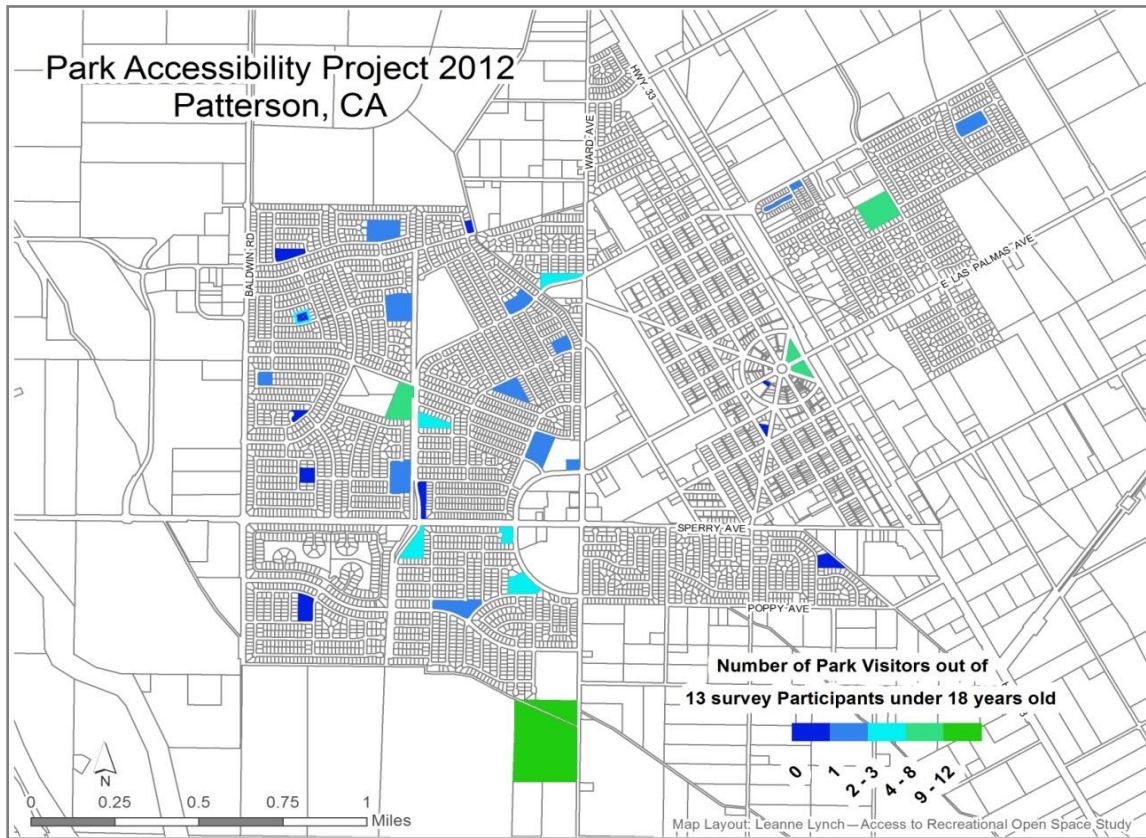


Figure 15: Frequency of visits by minors

During the GIS analysis a few variables may have influenced these results in ways that require further study. For example, Meadow Rue Park, the Skate Park, and the grassy area at Las Palmas and Sperry Avenue across from Meadow Rue Park, were near several businesses where theft and other crimes had occurred and although three of the seven parks with high predicted incidents are situated near a shopping center, the

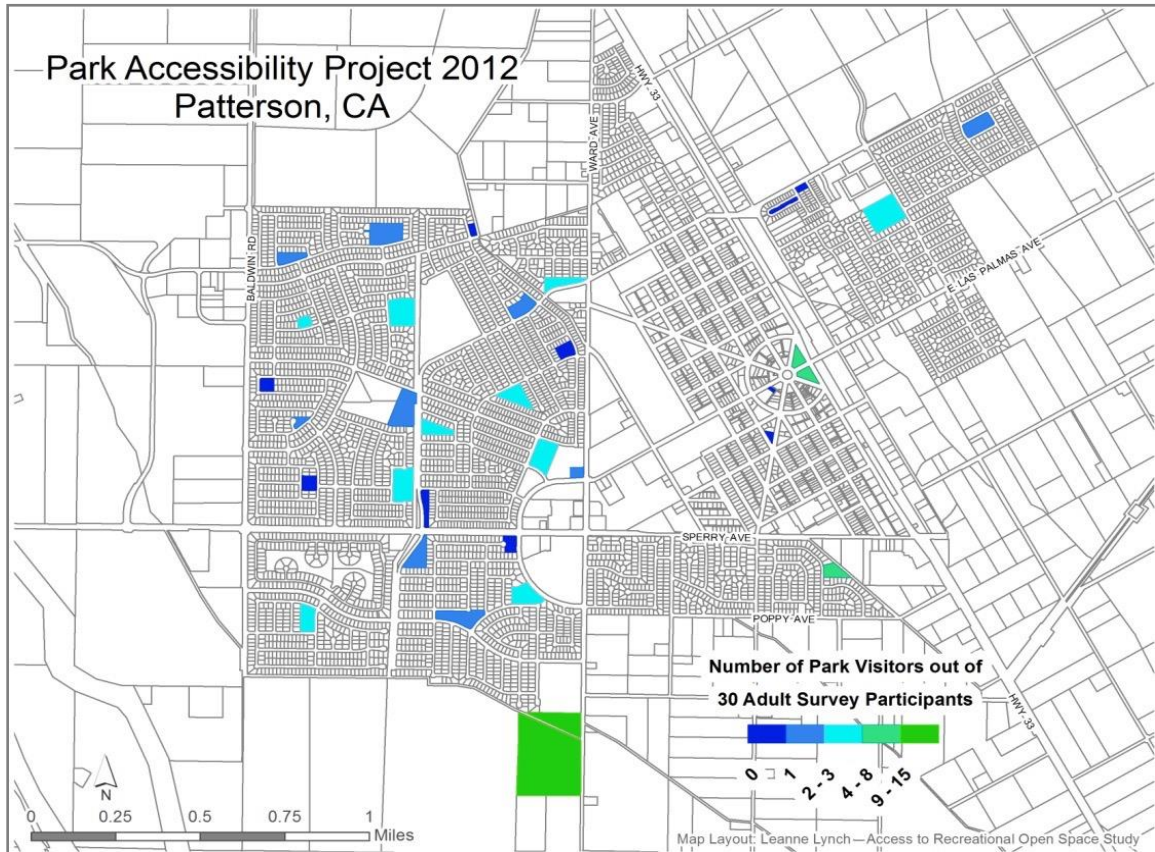


Figure 16: Frequency of visits by adults

crime occurring within a grocery store may not have affected access to nearby parks. Similarly, incidents occurring in homes, such as burglaries or domestic violence, may not inhibit a visitor of a nearby park as those activities are often hidden from view of the public and would have been appropriate to remove from the study. Also some of the crimes that were reported in the police log did not include spatial information and instead had descriptions such as “northeast Patterson” or “Patterson.” Incidents reported without a specific location were omitted from the study. Spatial information in these cases would have been useful as several would have been categorized as assault, which may be considered the most serious of crimes. Further study into the influences of crime and

incidents near parks would be necessary to assess any correlation between barriers to parks and people's perceptions of those incidents and should include the expertise of a crime analyst or person with a criminal justice background. As my data were stolen, future research would need to focus on incidents occurring in public that might demonstrate more causality between those incidents and people's access to parks.

A Master Plan was available for the nearby City of Turlock on their Parks and Recreation website. Turlock's Parks Master Plan Report was adopted in 1995 and reviewed in 2003. The document included Parks and Recreation user surveys which showed similar preferences of residents' results to the Public Participatory responses I received in 2012. The Turlock surveys were gathered using 5 methods: Adult surveys through a mailed utility bill; two separate youth surveys administered at local elementary, junior, and high schools; face-to-face interviews at a local park; and finally public workshops. I did not reach out to as many Patterson community members, or in as many ways, however using PPGIS and interviews this study acquired similar responses without the prompt of specific features as in the surveys administered in Turlock.

Adult citizens of Turlock chose amenities by importance of practical needs such as lighting, bathrooms, bicycle paths, and the type of equipment. Youth had preferences for shade trees, organized sports, and having places to hang out (City of Turlock, 1995). Although the Patterson surveys did not ask participants to rate amenities by level of importance, most of the same amenities and activities mentioned during the Patterson accessibility survey were considered at least moderately to very important in the Turlock survey (Table 6). To better compare the results of a park survey, Turlock would need to

administer an updated version of their 1995 survey with Patterson using the same or similar questions and methods for collection. Since Patterson contracted with Gates & Associates to research and develop the Parks and Recreation Master Plan Draft in 2102, there wouldn't likely be funding for another such project unless it was performed by an independent agency or research team.

Table 6: Turlock and Patterson survey results for preference of amenities.

Turlock Survey: Importance of Amenity	Ranking: 3=very important to 1=not of importance	Patterson Survey: Favorite Feature/Amenity/Activity at Parks	Tallied Responses from 43 PPGIS surveys and interviews
Restrooms	2.83	Dog Park	7
Children Play Area	2.8	Play with children	5
Open Space	2.76	Relax	5
BBQ/Picnic Areas	2.64	Picnic	4
Lighted Sports Facilities	2.43	Playground Equipment	4
Bike Paths	2.4	Trees and green grass	3
Sports Fields	2.36	Walk Around the Park	3
Volleyball Courts	2.26	Soccer	3
Tennis Courts	2.27	Bathrooms	3
Basketball Courts	2.27	Horseshoe Pit	2
Wading Pool	2.14	Baseball	2
Swimming Pool	2.04	Shade	2
Horseshoe Pits	1.98	Family Gatherings/ Birthday Parties	2

For an updated assessment on park need and accessibility, Patterson would benefit a community survey focused on resident satisfaction with park amenities, size, locations, and identification of barriers to park access.

RECOMMENDATIONS

The use of GIS as an approach to this study provided results that were supported and enhanced by the participatory surveys and PPGIS mapping analysis. Although much of people's access to recreational open space could be determined by data collected from online sources, the first-hand reports of people's favorite features of parks, what features parks lacked and what barriers existed, provided information needed to make clear recommendations that may improve park access. The following recommendations are based on the results and analysis of this research. Ways to facilitate the implementation of these suggestions have been selected among several programs, organizations, and initiatives actively working to improve people's access to recreational open space.

Preferences in the parks people chose to visit were based on the features and amenities of those parks regardless of their physical distance. Many parks required travel of over one quarter mile, often across busy roads, and yet were preferred over parks existing closer to participants' homes. Garza Park, having some of the features preferred by participants, was the largest and only park in its neighborhood and the only city park in Patterson with a 90' ballfield, yet it was considered inaccessible due to nearby unlawful activities (Gates & Associates). Survey participants of all age groups responded negatively toward Garza Park due to a lack of maintenance, safety concerns, and outdated amenities. The direction of the park is ideal with access from two sides, which typically prevents vandalism, but a farmworker labor camp facing one side of the park has been the source of numerous unlawful incidents. Facility improvements made by the city, regular

maintenance, and community involvement in revitalizing the neighborhood could help reclaim Garza Park, and other parks needing similar improvement, as favorite recreational spaces. Solutions to improve accessibility for pedestrians and cyclists who prefer to visit parks further away from their home or place of work include repainting faded bicycle lanes and the addition of crosswalks with caution lights on busy streets.

Based on participatory survey results, many of Patterson's most popular parks are adjacent to high crime areas. Incidents occurring near these parks may not have been severe or influential enough to prevent people from accessing them, or the use of amenities available at those parks outweighed any potential safety risks. Since age-specific park amenities were described as important to survey participants of all ages, choosing to increase the number and variety of favorable amenities and activities can be justified for all parks. Choosing only to improve select parks or amenities based on the highest density of people in a target age group would not consider the fluctuation in age or feature preferences of neighborhood visitors over time. Families that remain residents in Patterson for more than ten years might find nearby park's amenities obsolete if the equipment only focuses on toddlers or solely on adults as seen at Blenheim, Camas Lily, Castlebrite, and Goldbar Parks. The addition of amenities for a variety of ages may immediately increase access and more evenly distribute usage among parks. If the City is unable to fund the addition of aesthetic or functional improvements to parks, local campaigns may be launched to encourage community members to contribute funds and advocate for better use their parks.

Increase Community Participation and Awareness

Initiatives to increase park usage and community participation in creative solutions to improving access to parks can be found in both large and small cities across the United States. The California Park and Recreation Society (CPRS) is a nonprofit organization that acts as a resource for participating members advocating access to parks. To promote the benefits of parks and raise community awareness of recreational programing, CPRS developed the Parks Make Life Better® Branding Campaign which can be found on the posters and t-shirts in park programs throughout California (CPRS, 2016). The campaign brings solidarity to community members volunteering and participating in park events and meant to encourage interest in the field of parks and recreation (CPRS, 2016). The City of Santa Rosa has utilized the campaign in both the City website and in their Master Plan. Santa Rosa is a recipient of the Healthy Play Action Grant awarded by CPRS, by designing a diverse recreation area called “A Place to Play Park” (City of Santa Rosa, 2016). Patterson also joined the Parks Make Life Better® campaign prior to this study and evidence of branding was seen during the Earth Day Event in 2012.

Develop City-led Park Programs

A city-based organization, City Parks Foundation was developed for the sole purpose of promoting programs in New York City public parks. The Foundation is dedicated to “invigorating and transforming parks into dynamic, vibrant centers of urban

life through sports, arts, community development, and education programs” (City Parks Foundation, 2016). One of the City Parks Foundation programs, People Make Parks, is a participatory training program that helps community work together to envision and share ideas that can lead to park design and implementation (City Parks Foundation, 2016).

When people work together to create the spaces they wish to see, they become invested in the process and have more ownership in the park, a sentiment shared by the Foundation and also one of the Patterson survey participants. An important aspect of park development is community input. In New York City the initial step in the design phase of a park project begins with a scoping meeting that includes community stakeholders like local government officials, interested neighborhood groups, and the general public (New York City Parks, 2016). The transparency and inclusivity in all phases of park development promotes trust and ensures accessibility for its users.

Adopt a Parks and Recreation Master Plan

The purpose of a Parks and Recreation Master Plan is to act as a guide for facility maintenance and future development of recreational spaces in a community that adhere to State mandated standards of size, quantity, and accessibility (Gates & Associates, 2012). When the Patterson Parks and Recreation Master Plan Draft becomes adopted as a part of the City’s General Plan it will guide the City in immediate and long term park planning. Patterson’s General Plan stated a goal of 5 acres per 1,000 residents, but as of 2012 was short seven of the desired 105 acres needed to meet that goal (Gates & Associates, 2012). The Draft also distinguishes between neighborhood and community parks and

recommends acreage for each type (Table 7) (Gates & Associates, 2012). Initiating park standards through a Master Plan will guide future park development and help prioritize redevelopment of current parks.

Table 7: Park Type Standards from Gates & Associates, Parks & Recreation Master Plan Draft

	Ratio	Size	Service Area
Neighborhood Park	2.5 acres per 1,000	Min. 2 acres	¼ to ½ mile
Community Park	2.5 acres per 1,000	Min. 20 acres*	1 to 2 miles

*exceptions may be made for special community serving parks

A key feature of accessible recreational open space is its usability year-round.

Gates & Associates distinguish that if “the park acreage includes a detention basin, credit shall be apportioned according to the estimated usable time for the detention basin portion of the acreage” (Gates & Associates 86). As drainage basins fill with water or saturate during rainy seasons, they become useless for sports related activity or play.

Recalculating the amount of accessible parkland based on its usability year round would identify the reduced acreage available and encourage the City to add additional parks or recreational facilities. One possible reason why Patterson has yet to adopt the Parks and Recreation Master Plan is that the City does not have the financial means to comply with the recommendations and standards, such as having enough acreage available for the number of residents year-round, once the Master Plan is adopted. Developing a budgeted timeline for implementation of park improvements outlined in the Master Plan would meet economic concerns regarding its adoption and possibly boosting public confidence in the City for prioritizing recreational open space accessibility.

Meeting the Need and Standards of Available Parkland

Patterson supports youth and adult, casual and organized, sports leagues, but only maintains one competition field, which is available at the T.W. Sports Complex. The fields on school grounds are not counted as accessible as their priority is school related activities. Most are being fenced in with locked gates and only accessible with prior reservation. At the time of this study Patterson had “18 multi-use lawns that were suitable for practice, although 14 were located in detention basins”, and since the popularity of soccer was so great, casual and organized teams had to compete for unreserved usable space (Gates & Associates, 2012). To meet the sports field needs of Patterson residents a standard is recommended for development in a large single complex (Table 8). As the population of Patterson will likely continue to grow, the need for additional sports-focused fields will increase. Unless the City has funds to acquire additional surrounding farmland, one solution to increase the number of usable fields would be for the City of Patterson to collaborate with the Patterson Unified School District. Liability for injury, cost of maintenance, and vandalism has many schools close their campus recreational areas when school is not in session, but by opening them to city program use, the number of accessible fields offered by the high school and middle schools would likely meet the recommended Field Standards (276 CA. Rev. Code Sec 6647). Opening access to school fields could also save the City money because they would not have to develop new parks, instead adding school and/or City maintenance jobs to open and close the gates and monitor the fields during use.

Table 8: Rectangle Field Standards by Gates & Associates

	All Fields	Game Fields
Existing City Fields	1:1,200	1:21,000
Recommended Standard	1:2,500	1:5,000

Though not an exhaustive list, all recommendations have been made for the improvement of access to recreational open space in Patterson. The organizations and programs whose focus are to increase access and use of recreational open space have been discussed for their focus on removing barriers such as safety concerns, transportation issues, lack of amenities, and to ensure compliance of park use standards. As shown in the literature, the involvement and inclusion of the community in the development and redevelopment of parks will foster public buy in and encourage more people to participate in healthy outdoor recreational activities.

CONCLUSION

The goal of this study was to investigate people's experiences in accessing recreational open space in Patterson. Access was defined by the way people travelled to parks, through surveys identifying parks most frequented and why, measured by the barriers keeping people from visiting parks, and determined by utilizing GIS and PPGIS methods. Though Patterson is fortunate to have a number of city-maintained recreational spaces, there are factors that the community experiences as barriers when attempting to access parks. PPGIS data collected through surveys and public events enhanced GIS analysis of proximity, census, and crime/traffic data to show that people accessing parks within a quarter mile of their home or work have been influenced negatively by those factors causing them to access parks less. Some parks with desired amenities continued to attract visitors even though incidents of crime occurred nearby. Attractive features should be constructed at parks in all neighborhoods, regardless of crime and traffic incidents, to increase overall park access and encourage utilization.

Since children rely on parental/guardian approval and transportation to parks farther away, those children living near parks with a high likelihood of incidents are more at risk of exposure to dangerous or unsafe activity. Infrastructure improvements such as increasing options for non-motorized vehicle transportation should be considered to ensure safety and access to parks for people of all ages, but especially for the population who are most vulnerable. Additional surveillance, law enforcement, and maintenance of parks and recreation areas promote confidence in park goers. Signs of neglect represent a

place where no one is in charge and can encourage unlawful activities, further degrading a place and making it less accessible and more difficult to regain control. Visible evidence of depreciating behaviors can come as graffiti, discarded drug paraphernalia, and sights and sounds of violence or aggressive behaviors. All parks in Patterson will require active community participation in reporting unlawful activity, funding for frequent maintenance, amenity upgrades, and where space allows, park expansion in order to meet the needs of an active community.

Patterson was the focus of this research, though other nearby towns could be considered for a comparable study as they may one day experience similar growth. Planning for future growth and including the community in decisions made around that growth can prevent some of the major challenges that were felt by Patterson residents between 1999 and 2007. The challenges of unplanned growth that were experienced by Patterson include its schools filling up before renovations could be finished on existing campuses and development on the new campus, lack of pedestrian accessible roadways, and the design and development of inaccessible parks lacking proper amenities. Barriers that the City of Patterson must overcome in order to improve parks in Patterson include financial, current city planning systems, and the behavioral patterns of residents. Financial considerations for improving access to parks in Patterson may not be a priority for the City or its residents and only when it becomes a priority will funds be allocated to their redevelopment. Fortunately for Patterson the work of a Parks and Master Plan Draft has already been completed, so by approving the Draft, Patterson will begin the process of prioritizing the improvements of current parks and allocation of new parks where

neighborhoods lack. Finally, increased events planned at parks as entertainment, celebration, and recreation will put a focus on their importance and gain support and attention from the community.

The survey results and analysis of this study were included in the City of Patterson Parks and Recreation Master Plan Draft. Since the Draft's completion in 2012, the City of Patterson has yet to vote on its adoption to the City's General Plan, impeding the development and benefits the Plan has outlined. To better serve the community of Patterson, the City Council should make approving the Draft a priority whereas the recreational needs of Pattersonites go unmet. Inclusive, community planning will be instrumental in prioritizing the necessary improvements to existing parks and implementation of new ideas to future park development so that residents and visitors will encounter fewer barriers to parks, helping to create a healthier environment for Patterson.

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APPENDIX A CONSENT FORMS & SURVEYS

Consent to Participate in Research *Access to Recreational Open Space in Patterson, California* Parental/Guardian Consent Form

Your child has been invited to participate in a study during his/her after-school program or club. The study is being conducted by Leanne Lynch, a Patterson High School graduate (class of 2000) and current graduate student, attending Humboldt State University. Participation in the study is voluntary. Please read the description of the study below, and use the contact information provided to ask any questions you may have before signing and returning this consent form.

Purpose of the study:

To investigate children's access to recreational open spaces (parks) within Patterson City limits and identify potential barriers that keep children from accessing parks. Data collected from this study will be included in a larger project that discusses public access to parks in the City of Patterson. Results of the project may be presented to City of Patterson employees, published in local media, and will be included in the bound Master's Project by principle investigator, Leanne Lynch.

Duration and Location:

Completing the study will take approximately 15-20 minutes during the after-school program/club for which your child is a member.

Procedures:

- 1.) Children will participate as a group in a discussion about access to local parks with their supervisor during and at the location of their typical after-school program.
- 2.) Children will locate their neighborhood (not his/her address) and parks on a map and talk with the supervisor and each other about which parks they use and how they get there, what they like about their parks, and equipment they wish their parks had.

Potential Risks and Discomforts:

Participation is voluntary and confidential. There is no risk to children as they will be participating in their general after-school activities and students are free to withdraw from the discussion at any time

Anticipated Benefits to Participants:

Your child will not receive a direct benefit from participating in this study, but may help uncover barriers to accessing parks.

Alternatives to Participation:

Children without consent to participate in the study will be given a similar map of Patterson to follow along, but will not turn in the map or be included in the study.

Confidentiality:

Information from this study that is published, presented, or discussed will not reveal the identity of any child participants. Photographs taken during the study will be used for educational purposes and your child's identity will not be revealed. Data provided by participants will be kept separate from signed consent forms so that no one can link the names of participants to the data.

Participation and Withdrawal:

Participation in the study is voluntary and refusal will not impact your child's involvement in the after-school program/club where he/she is a member. You may withdraw consent to participate in the study at any time without jeopardy.

Identification of Investigators For questions regarding this study, please contact:

Principal Investigator: Leanne Lynch Ph: 209-505-8806; ls121@humboldt.edu
or faculty supervisor Dr. Yvonne Everett (Department of Environmental Science and Management)
Humboldt State University Ph: (707) 826-4188; everett@humboldt.edu

If you have questions regarding your rights as a participant, any concerns regarding this project, or any dissatisfaction with any part of this study, you may report them—confidentially, if you wish—to the Dean for Research & Sponsored Programs, Dr. Rhea Williamson at Rhea.Williamson@humboldt.edu or (707) 826-4189.

By signing this consent form you acknowledge whether your child may participate in the Access to Recreational Open Space study, you understand the details of the study, and have retained a copy of this form for your records.

_____ Child's Name	_____ Parent/Guardian Signature	_____ Date			
I understand his/her identity will not be revealed	My	child	may	be	
photographed: <u> </u> yes <u> </u> no					
_____ Investigator Signature	_____ Date	_____ Witness Signature		_____ Date	

Consentimiento a participar en una encuesta
El acceso al espacio abierto en Patterson, California
Paternal/guardián impreso de consentimiento

Su niño está invitado a participar en una estudia durante su programa o club después de las clases. La estudia es conducida por Leanne Lynch, una graduada de Patterson High School (clase de 2000) y una estudiante de posgrado actual, quien está asistiendo al Humboldt State University. La participación en la estudia es voluntario. Por favor leer la descripción de la estudia abajo, y usar la información del contacto para preguntar cualquieras preguntas antes de afirmar y entregar este impreso de consentimiento.

Propósito de la estudia

Para investigar el acceso a los parques para los niños en los límites de Patterson City y para identificar los potenciales impedimentos que excluyen a los niños de los parques. Los datos recogen en esta encuesta estará incluida en un proyecto más grande que va a discutir de los parques en Patterson City. Los resultados del proyecto podrían ser presentados a los empleadores de Patterson City, también publicados en los medios de comunicación y serán incluidos en el Proyecto del maestro de la investigadora principal, Leanne Lynch.

Ubicacion y Duracion:

La estudia va a durar 15-20 minutos, después de las clases durante el programa o club de su niño.

Los procedimientos:

- 1.) Los niños van a participar como un grupo para discutir del acceso a los parques con su supervisor durante y a la ubicación de su programa típico después de las clases.
- 2.) Los niños van a ubicar su vecino (pero no va a ubicar su residencia) y los parques en un mapa y van a hablar con su supervisor y entre sus mismos sobre cuáles son los parques que usan y como llegan al parque, que les gustan sobre sus parques y el equipo los niños esperan que sus parques tengan.

Los riesgos y desacomodos potenciales:

La participación es voluntaria y confidencial. No hay un riesgo a los niños porque van a participar en sus actividades regulares después de las clases y los estudiantes pueden retirar de la encuesta cuando sea.

Los beneficios anticipados a los participantes:

Su niño no va a recibir un beneficio directo para participar en la encuesta, pero puede descubrir los impedimentos del acceso a los parques.

Alternativas a la participación:

Los niños que no dan su consentimiento para participar en la encuesta recibirán un mapa parecido de Patterson para empuñar con el grupo, pero no pueden entregar el mapa ni ser incluido en la encuesta.

La confidencialidad:

La información de esta encuesta que es publicada, presentada, o discutida no revelará la identidad de los participantes jóvenes. Las fotografías tomadas durante la encuesta estarán para el uso de educación y la identidad de su niño no va a ser revelada. Los datos facilitados por los participantes guardaran separados de la papelería del consentimiento, y por eso nadie puede conectar los nombres de los participantes con los datos.

La participación y retirada:

La participación en esta encuesta es voluntaria y la negación no impactará la inclusión en el programa o club después de las clases donde él/ella está un miembro. Puede retirar el consentimiento para participar en cualquier tiempo sin repercusiones.

Identificación de los investigadores Para las preguntas sobre esta encuesta, por favor contactar:

La investigadora principal: Leanne Lynch Ph: 209-505-8806; ls121@humboldt.edu
o supervisora de la facultad: Dr. Yvonne Everett (Department of Environmental Science and Management)
Humboldt State University Ph: (707) 826-4188; everett@humboldt.edu

Tendría preguntas sobre sus derechos como participante, cualquieras preocupaciones sobre este proyecto, o insatisfacciones con cualquier parte de esta encuesta, puede informarlos-con la confidencialidad, si quiera- al Dean for Research & Sponsored Programs, Dr. Rhea Williamson al correo electrónico:

Rhea.Williamson@humboldt.edu o por teléfono: (707)826-4189.

Por afirmar este forma del consentimiento reconoce que su niño puede participar en la encuesta del acceso a los espacios abiertos del recreo, entiende los detalles de la encuesta, y tienes una copia de este forma para sus registros.

Nombre del niño Firma del padre/guardian Fecha Mi niño puede ser fotografiado: __si__ __no__
Yo entiendo que su identidad no será revelada

Firma de la investigadora Fecha Firma del testigo Fecha

Access to Recreational Open Space Survey: 13 Minor Responses ages 10 & 11; 13 surveys (The number after each response represents the total number of respondents having the same answer)

How old are you? Boy ____ Girl ____

1). Circle the neighborhood where you live on the map. Circle size:

2). Color in all of the parks that you visit

3). Number the parks you visit on the map from 1-5 using number 1 for the park you visit the most, number 2 for the park you visit the second most, and so on.

4). List all of the ways you travel to the park.

Walk: 5



Bicycle: 4
 Car: 7
 Skate: 1
 Scooter: 2

5). What do you like to do at the park? What are you favorite features of the parks you go to?

Monkey bars
 Play on the playground equipment: 3
 Walk the dogs and play with them: 2
 Football: 2
 Soccer: 2
 Baseball: 1
 Batting Cage: 1
 Play catch: 1
 Run around: 1
 Ride bike: 1
 Play sports with my team: 1
 Play with family/friends: 1

6). What barriers/challenges make it difficult for you to travel to the park?

Parents going to work: 2
 Going other places (busy): 2
 Parents need to take me: 1
 None: 2
 Fights at Garza Park: 1
 Parents worried something might happen to me: 1
 Police, parents: 1

7). What keeps you from going to the park more often?

Night time: 1
 Too far to walk to: 1
 After school program: 1
 Need to study for tests at school: 1
 Gangs: 3
 Need a ride: 1
 Violent issues and scary people: 1
 Police: 1
 Playing video games: 1
 Busy with sports: 1

8). If you were in charge of planning and designing your favorite park, what would you do?

Make it a water par: 1
 Make a park with a cover over it to stop the weather and instead of bark I will put foam: 1
 I would divide it into a big sports complex for all sports and make sure every sport has their own field.
 Open 24 hours : 1
 Sports Fields: 1
 Big playgrounds and swings: 1
 Supervise the parks more often (cameras): 4
 Put a dodge ball court, golf course, swimming pool, vending machine for food and water, and sprinklers so we can run in them: 1
 I would make long monkey bars, swirly slides, and stairs: 1

Draw a picture of what you think of when you hear the word *barrier*.

Rain over playground equipment: 2

Sprinklers: 1

Hole: 1

House with child in the window: 1

Child in her room at a desk: 1

Fence: 1

Strangers approaching child: 1

Consent to Participate in Research
Access to Recreational Open Space in Patterson, California
Public Participatory Consent Form

The study is being conducted by Leanne Lynch, a Patterson High School graduate (class of 2000) and current graduate student, attending Humboldt State University. Participation in the study is voluntary. Please read the description of the study below, and use the contact information provided to ask any questions you may have before signing this consent form.

Purpose of the study:

To investigate access to recreational open spaces (parks) within Patterson City limits and identify potential barriers that keep people from accessing parks. Data collected from this study will be included in a larger project that discusses public access to parks in the City of Patterson. Results of the project may be presented to City of Patterson employees, published in local media, and will be included in the bound Master's Project by principle investigator, Leanne Lynch.

Duration and Location:

Participation in the study will take approximately 30 minutes or less and will be held in front of the Senior Center on April 21 and where this consent form is distributed.

Procedures:

- 1.) Participants will complete the study in a group setting, evaluating access to local parks, with the principal investigator leading the discussion.
- 2.) Participants will locate their neighborhood (not an exact address) on a map, mark which parks they use, describe how they get there, what they like about their parks, and pinpoint barriers that keep them from accessing parks.

Potential Risks and Discomforts:

Participation is voluntary and confidential. There is no risk to participate and are free to withdraw from the discussion at any time.

Anticipated Benefits to Participants:

Participants will not receive a direct benefit from contributing to this study, but may help uncover barriers to accessing parks.

Alternatives to Participation:

Without a completed consent form, interested community members may watch the process, but any input given will not be included in the study.

Confidentiality:

Information from this study that is published, presented, or discussed will not reveal the identity of any participants. Photographs taken during the study will be used for educational purposes and participants'

identities will not be revealed. Data provided by participants will be kept separate from signed consent forms so that no one can link the names of participants to the data.

Participation and Withdrawal:

Participation in the study is voluntary and refusal will not impact the participant in any way. Participants withdraw consent to participate in the study at any time without jeopardy.

Identification of Investigators For questions regarding this study, please contact:

principal Investigator: Leanne Lynch Ph: 209-505-8806; lsl21@humboldt.edu
or faculty supervisor Dr. Yvonne Everett (Department of Environmental Science and Management)
Humboldt State University Ph: (707) 826-4188; everett@humboldt.edu

If you have questions regarding your rights as a participant, any concerns regarding this project, or any dissatisfaction with any part of this study, you may report them—confidentially, if you wish—to the Dean for Research & Sponsored Programs, Dr. Rhea Williamson at Rhea.Williamson@humboldt.edu or (707) 826-4189.

By signing this consent form you acknowledge your participation in the Access to Recreational Open Space study, you understand the details of the study, and have retained a copy of this form for your records.

		I may be photographed: <u> </u> yes <u> </u> no	
Participant's Name	Participant's Signature	Date	I understand my identity will not be revealed
Investigator Signature	Date	Witness Signature	Date

El consentimiento para participar en una encuesta ***El Acceso al Espacio Abierto del Recreo en Patterson, California*** Impreso de consentimiento para la participación del público

Esta estudio es conducida por Leanne Lynch, una graduada de Patterson High School (clase de 2000) y una estudiante de posgrado actual quien está asistiendo al Humboldt State University. La participación en la estudio es voluntario. Por favor leer la descripción de la estudio abajo, y usar la información del contacto para preguntar cualquiera preguntas tendrías antes de firmar este forma del consentimiento.

Proposito de la estudio:

Para investigar el acceso a los parques para los niños en los límites de Patterson City y para identificar los potenciales impedimentos que excluyen a los niños en los parques. Los datos recogen en esta encuesta estará incluida en un proyecto más grande que va a discutir de los parques en Patterson City. Los resultados del proyecto podrían ser presentados a los empleadores de Patterson City, también publicados en los medios de comunicación y serán incluidos en el Proyecto del maestro de la investigadora principal, Leanne Lynch.

Ubicacion y Duracion:

La participación en la estudio va a durar menos de 30 minutos, y será conducida va a ocurrir en frente del Senior Center (Centro para los de mayor edad) en la fecha de Abril 21 y tambien donde este impuesto de consentimiento es distribuido.

Los procedimientos:

- 1.) Los participantes van a completar la estudio como un grupo. Van a evaluar el acceso a los parques locales con la investigadora principal como líder de la discusión.
- 2.) Los participantes van a ubicar su vecino (pero no van a ubicar su residencia) en un mapa. Van a señalar cuales parques usan, describir como viajan a los parques, que les gustan sobre los parques, y señalar los impedimentos para visitar a los parques.

Los riesgos y desacomodos potenciales:

La participación es de su voluntad y es confidencial. No hay un riesgo y los estudiantes pueden retirar de la encuesta cuando sea.

Los beneficios anticipados a los participantes:

Su niño no va a recibir un beneficio directo para participar en la estudio, pero puede descubrir los impedimentos del acceso a los parques.

Alternativas a la participación:

Sin un forma de consentimiento completado, los miembros de la comunidad quien esta interesados pueden mirar el proceso, pero no pueden dar información para inclusión en la estudio.

La confidencialidad:

La información de esta estudio que es publicada, presentada, o discutida no revelará la identidad de los participantes jóvenes. Las fotografías tomadas durante la estudio estarán para el uso de educación y la identidad de su niño no va a ser revelada. Los datos facilitados por los participantes guardaran separados de la papelería del consentimiento, y por eso nadie puede conectar los nombres de los participantes con los datos.

La participación y retirada:

La participación en esta estudio es de voluntad y negación no impactara la inclusión en el programa o club después de las clases donde él/ella está un miembro. Puede retirar el consentimiento para participar en cualquier tiempo sin repercusiones.

Identificación de los investigadores Para las preguntas sobre esta estudio, por favor contactar:

La investigadora principal: Leanne Lynch Ph: 209-505-8806; lsl21@humboldt.edu

o supervisora de la facultad: Dr. Yvonne Everett (Department of Environmental Science and Management)

Humboldt State University Ph: (707) 826-4188; everett@humboldt.edu

Tendría preguntas sobre sus derechos como participante, cualesquiera preocupaciones sobre este proyecto, o insatisfacciones con cualquier parte de esta estudio, puede informarlos-con la confidencialidad, si quiera- al Dean for Research & Sponsored Programs, Dr. Rhea Williamson al correo electrónico:

Rhea.Williamson@humboldt.edu o por teléfono: (707)826-4189.

Por afirmar este forma del consentimiento reconoce que su niño puede participar en la estudio del acceso a los espacios abiertos del recreo, entiende los detalles de la estudio, y tienes una copia de este forma para sus registros.

Nombre del participante _____

Firma del participante _____

Fecha _____

Puedo ser fotografiado: ____si ____no Entiendo que mi identidad no será revelada

Firma de la investigadora _____ Fecha _____

Firma del testigo _____

Fecha _____

Access To Recreational Open Space: Adult Responses ages 18 and older; 30 surveys

Please circle your age group and gender: Between 18-30 30-65 Over 65 Male Female

1). Circle the neighborhood where you live on the map. Circle size:

2). Number the parks you visit from 1-5 using number 1 for the park you visit the most, number 2 for the park you visit the second most, and so on and draw in the route you take to get there.

3). List all of the ways you travel to the park.

Drive: 22

Walk: 20



Run: 4
 Bicycle: 9
 Bicycle around neighborhoods passing the parks: 1
 Roller Blade: 1
 Skate: 2

4). What do you like to do at the park? What are your favorite features of the parks you go to?

Soccer: 3
 Volleyball
 Swings: 2
 Toddler swings: 1
 Slide: 2
 Picnic: 4
 Take animals (Walk dog, room for dogs to run at the dog park): 7
 Walk around park: 3
 Relax: 5
 Talk with friends: 3
 Play with children/grandchildren: 5
 Let children play: 1
 Climbing structures: 1
 Hold teen activities: 2
 Trees and green grass: 3
 Kid play area is nice to have close to home: 3
 Horseshoes: 2
 Baseball: 2
 Shade: 2
 Clean parks: 2
 Less trouble with gangs: 1
 Roller Blade: 1
 Bike Ride: 1
 Water fountain: 1
 Bathrooms: 2
 Workout: 1
 BBQ: 1
 Family Gatherings/Birthday parties: 2
 Sports: 1
 Play catch: 1

5). What barriers/challenges make it difficult for you to travel to the park? (What keeps you from going to certain parks)?

Privacy at some parks, like bushes and big buildings, because you can't see who may be there like homeless or gang activity: 1
 Loose dogs: 3
 Gangs: 3
 Drugs/selling drugs: 2
 Bathrooms: 2
 Wheelchair access: 1
 Lack of Shade: 2
 No shade on play structures for kids (hot slides): 1
 Not enough safe toddler equipment: 1
 Heat: 1
 Lack of drinking water at the parks: 1

Lack of bike trails: 1
 Distance: 6
 Too crowded: 1
 Old age ("older-further you don't want to go"): 1
 Physical health: 1
 None: 1
 Pot holes: 1
 Many are unknown: 1
 Bad roads: 1
 No sidewalk along one of my routes: 1
 Not enough parking: 1
 Rude people: 1
 Access: 1

6) What keeps you from going to the park more often?

Lack of shade structures over play equipment, need shady areas (hot play structures): 3
 Lack of good play equipment: 1
 Dogs (The dogs became loose one day and were fighting): 2
 Gangs: 1
 Drugs: 1
 People smoke and do drugs at the skate park: 1
 Distractions at home: 1
 People drinking alcoholic beverages: 1
 Time: 8
 Money: 1
 New bike: 1
 Too far: 2
 Lack of incentive: 1
 Work: 1
 None: 1
 I don't let children go to Garza: too much graffiti and gang violence: 1
 Not enough dog parks: 1
 Bathroom access: 1
 Weather: 2
 Graffiti, litter, thugs hanging out and making it a hostile environment: 1
 I don't want to: 1

7). On the large map: label the locations of the barriers that keep you from accessing parkland and other areas around town.

8). If you were in charge of planning and designing better ways to access your favorite parks, what would you do?

More equipment: 2
 "Providing sidewalks through out-of-the-way for easy access": 1
 Consistent openings-gates locked usually or left open all night (Sunflower Park): 1
 More lights: 1
 No fences for children or toys, less gates (more gates and security usually means worse area and further threats): 2
 Have open bathrooms: 2
 More bike lanes: 1
 Smoother roads to access for skateboards: 1
 Add shade structures to cover play equipment and for people wanting to sit and rest: 4
 Dog poop bags: 1

Garbage cans: 1
 More toddler equipment
 More picnic tables at more parks: 1
 Provide transportation for better access to people that live far from the park: 1
 Security cameras: 1
 Better walking paths (meandering) that connect parks, Trail network that you would be able to go from one park to another with vegetation: 4
 Shorter passage to cut across to the park: 1
 Signage to local parks: 2
 Make a garden park (themed), make each different: 1
 Use natural landscaping and native plants: 1
 Parking areas, not just on the street: 1
 More water fountains: 1
 Need larger parks: 1
 Make them closer: my neighborhood is distant from most parks: 2
 Ask local residents to provide feedback: 1

What is important that hasn't been addressed here?

Bathrooms at more than one location: 2
 Parks should host "park days" and each neighborhood should be responsible for its turnout and activities (involve neighborhoods around park): 2
 Have more games: 1
 Paintball: 1
 Lighting in the South Park: 1
 Restrictions on beer: 1
 Inform people about the positive activities that they may do in the parks: 1
 Draw people there, for example: garden club raffle or workshops, music festivals: 1
 Sports Park should have horseshoe pit, more benches, and BBQ pit: 1
 More trees and landscaping: 1
 Love that Patterson is park filled: 1
 Keep it family oriented and safe: 2 (Beer drinking not family atmosphere): 3
 Teenagers doing drugs in the park: 1
 Security: some parks (Garza) are scary to go to because of the gangs, have the police/volunteers patrol the area more: 5
 Close to labor camp-Ghetto: 1
 Car theft, garages broken into: 1
 Lawn is not kept up in Garza (pot holes should be filled in, dangerous to play baseball): 2

APPENDIX B MAP OF PATTERSON



Map of Patterson that was printed (35" x 47") and used for the PPGIS events with an emphasis on park locations

APPENDIX C PHOTOS FROM EARTH DAY EVENT



APPENDIX D PHOTOS FROM APRICOT FIESTA EVENT



