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Built environment: Does geographical proximity play a role in exercise frequency and adherence?

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BUILT ENVIRONMENT: DOES GEOGRAPHICAL PROXIMITY PLAY A ROLE IN EXERCISE FREQUENCY AND ADHERENCE?

A Thesis

by

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ABSTRACT

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Built environment has been identified as a factor affecting exercise adherence. The author conducted a cross-sectional descriptive study to examine the relationship of distance traveled and its relationship to frequency of exercise and level of adherence.

Surveys with demographic and contextual information were collected from 260 participants. Demographic data was mapped using Geographic Information Systems software and data analyses were performed on geographical trends, participants' use facilities and participants' proximity to their respective place of exercise. Trends among participants across the various bands were determined.

The author found strong support to show geographical proximity as an important factor in frequency and level of exercise adherence. The maps prepared illustrated participant usage was highest among those living one mile or less from the facility. Further analysis confirmed 63% of participants surveyed lived less than a mile away from the surveyed sites. Forty percent of users who lived less than one mile away had high exercise adherence. Due to the degree of sample homogeneity, resulting statistical analysis determined proximity as accounting for only three percent of the variance in frequency of facility usage.

DEDICATION

First and foremost I dedicate my Master's career, this thesis, and my life to God. Through Him all things are possible (Philippians 4:13). Without His incessant guidance I would not have been on the right path. To Him belongs all the glory.

I also dedicate the completion of my Master's degree and this thesis to the three beautiful young ladies who kept me smiling through it all, my princesses: Daniella, Andrea and Natalya. Without your unfaltering support and your kind understanding none of this would have been possible. Thank you girlies for always being by Mommy's side every step of the way. I love you!!!

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CHAPTER 1

INTRODUCTION

Background

As America's obesity rates rise, exercise becomes an increasingly focal topic for research. United States Census data exemplify the close relationship between inactivity and obesity rates. The fittest states, such as Colorado, boast the lowest obesity rates, while the fattest states, such as Mississippi, have the highest inactivity levels (Trust for America's Health, 2009). Most people are aware of the correlation between an active lifestyle and a healthy weight; therefore, lack of exercise and inability to engage in exercise adherence remains a puzzle.

Exercise psychologists have studied the motivational factors behind the lack of exercise adherence. There are numerous reasons why people exercise and as many, or more, why people fail to stay active. Interestingly enough, past research investigating exercise adherence has uncovered a consistent line of reasoning for this phenomena. The Department of Health and Human Services uses a questionnaire (Barriers to Being Active Quiz) to measure seven categories for possible physical inactivity. The categories are fear of injury, lack of time, lack of resources, lack of energy, lack of skill, lack of willpower, and social influence (U.S. Department of Health and Human Services, 1999). Consistent exercisers have explained drawing their motivation to stay active from factors such as weight maintenance, health reasons, or the resulting exhilaration. While the

above factors affect exercise adherence in a personal respect, external factors such as environment can also play an important role. The surrounding environment, or built environment, has been identified as an encouraging factor or discouraging barrier affecting a person's level of participation (Weinberg & Gould, 2007). It is expected people are more likely to continue or even commence an exercise regimen if the surrounding built environment is conducive to activity. For example, a city can provide places to exercise in close geographical proximity to residential areas. Literature testing this hypothesis and analyzing data utilizing geographic information system software was not found; therefore, the current study investigated demographic indicators and determined how a city's built environment impacts individuals' geographical proximity and facility utilization using ArcGis 9.2 Software.

Statement of the Problem

Municipal governments typically have a general idea where recreational facilities should be geographically placed. Nevertheless, utilizing geographic information system (GIS) software to make educated decisions should not be undermined. No research was found describing use of facilities employing GIS software to analyze a location's built environment. Particularly, no known study had investigated facilities within the observed locale. Hence, the current study analyzed the degree of utilization of established facilities within the City of McAllen, Texas current built environment. Specifically, the current study investigated user demographics and the relationship between geographic proximity and facility utilization.

Purpose of the Study

This study was undertaken to determine a relationship between geographical proximity and degree of utilization at each recreational facility. The investigator sought to examine the correlation between geographical proximity and exercise adherence levels. The investigator uncovered how geographic proximity of a built environment affects an individual's frequency of attendance and level of exercise adherence in a self-monitored exercise program.

Need for the Study

This study served to determine if accessibility to recreational facilities within a built environment offered a high probability of utilization. A city's built environment plays a major role in the level of its resident's exercise activity. When surroundings are perceived as a barrier, it can discourage activity or encourage inactivity which then contributes to health-related problems. A built environment can greatly influence how apt an individual is in maintaining an exercise program (Pinzon-Perez, 2007). Therefore, it is of utmost importance to research resident's activity level and investigate its effect on healthcare costs since McAllen, Texas has the most expensive healthcare costs in the country, averaging double those of other cities (Gawande, 2009).

The City of McAllen as well as other municipal governments and private sector facilities will benefit from the data this study generates.

Research Questions

The investigator posed the following research questions:

1. How does distance to a recreational facility affect weekly frequency of use?
2. How does distance to a recreational facility affect level of exercise adherence?

3. What demographic variables are indicators of frequency of use and exercise adherence?

Null Hypothesis

Using the ArcGIS 9.2 geographic information system software, the investigator determined a three-mile radius around each of the chosen recreational facilities as the catchment vicinity. In order to categorize groups by distance from participants' residences to each of the exercise locations, the three-mile radius was divided into six one-half mile bands. Geographical proximity to the exercise location was determined to analyze if distance was significant to those who exercise therein. The investigator offered the following two null hypotheses:

1. There is no difference between groups living near the recreational facility (established at less than one mile radius) and those living further away (more than one mile radius) in frequency of use per week

2. There is no difference between groups living near the recreational facility (established at less than one mile radius) and those living further away (more than one mile radius) in exercise adherence

Definition of Terms

- **ArcGIS 9.2 Software**: Geographic Information System software used to analyze data and determine patterns, relationships, and trends resulting in a cartographic presentation
- **Band Address**: The designated sector within a half-mile radius band, as drawn by the ArcGIS 9.2 software, categorizing the geographical location of each participant's address

- **Barriers of physical activity**: Real and/or perceived constraints resulting in inactivity
- **Built Environment**: Man-made surroundings providing a setting for human activity, including civic and personal structures
- **Exercise adherence:** Adopting and maintaining exercise habits for a prolonged time
- **Geocode**: Input raw data of each participant's band address into ArcGIS 9.2 software in order to compile a geographical analysis of data collected
- **GIS** (Geographic Information System): Computer software used to map geographic points, create maps and obtain geographically precise data and other geographic information
- **Hotspots**: Clusters of geographically significant data identified by Geographic Information Systems software and visually displayed on a cartographically correct map

Assumptions

The investigator assumed the following when conducting the study:

- Participants answered the questionnaire voluntarily and honestly
- Participants went straight from home to exercise facility
- Participants were partaking in a self-monitored exercise regimen
- Participants provided the correct address from the built environment

Limitations

The following limitations were observed due to the nature of the study:

- Participants were residents of the Rio Grande Valley

- Participants surveyed were a sample found at designated times and days
- The ArcGIS system analyzed data straight-line, not streetwise
- Season of the year when data was collected may have biased results (weather conditions)

Delimitations

This contextual descriptive study was designed to analyze the relationship between geographical proximity and exercise adherence. Due to the convenient sample and the environment required by the study, the following delimitations were imposed:

- Participants were 18 years of age or older
- Participants were new captures, no recaptures were permitted
- Participants were not with a personal trainer or partaking in a teacher-led activity
- Participants were actively engaged in exercise at the recreational facilities chose

Significance of the Study

This study served to determine if accessibility of recreational facilities within a built environment offers a higher probability of utilization. Municipal governments and private sector facilities can benefit from the information gathered in this study. Through the findings of this investigation, the City of McAllen and other cities alike, can take notice of the uncovered relationship between increased opportunity for activities and a higher level of exercise adherence. A city offering multiple fitness-oriented facilities within their built environment results in higher levels of fitness (Pinzon-Perez, 2007). Therefore, the investigator wishes to impact local societies and encourage municipal governments to increase the number of parks, walk and bike trails, and other facilities conducive to physical activity within their built environment.

Organization of Remainder of Study

Chapter Two acquaints the reader with related literature and other topics relevant to the study. Chapter Three presents the methods employed within the current study including data collection, participant description, data analysis and statistical application. A thorough explanation of the ESRI ArcGIS 9.2 software and its involvement in the study is also provided in Chapter 3. In the fourth chapter, the author reports the findings and describes the statistical analyses used. The concluding chapter summarizes the findings, depicts conclusions, and discusses recommendations for municipal governments and possible future studies.

CHAPTER 2

REVIEW OF RELATED LITERATURE

Statement of the Problem

The current study examined demographic indicators of participants at the City of McAllen Parks and Recreation facilities. The variables utilized to conduct profiling were age, gender, education level, income level, times per week attended facility, length of consistent use, and band address, including quadrant. This study concentrated on geographical proximity to recreational facilities and its significance to individuals' frequency of use and level of exercise adherence within a built environment. Specifically, the current study determined user demographics and the relationship amongst the multiple half-mile radiuses from each specific facility. In an effort to make this a complete and noteworthy analysis, a comprehensive literature review was performed including relevant subjects such as the built environment, environmental barriers and exercise adherence.

Introduction

According to researchers, an exercise determinant is a factor proven to affect levels of exercise adherence (Weinberg & Gould, 2007). All determinants affecting exercise adherence are divided into two major categories: personal or environmental. In each of these categories, specific aspects of maintaining or discontinuing exercise are identified. In the personal category, characteristics identified include: demographic

variables, cognitive variables, and behaviors. In the environmental category, factors are further subdivided into the social and physical environment of an individual. Social determinants consist of two external factors: family and peer support; while physical determinants include factors such as cost, disruptions in routine, home equipment, weather, time pressures, distance and access to facilities (Dishman, 1985). There has been a positive association linked between accessibility of facilities and exercise adherence in physical activity (Shephard, 1978). The Perrier Fitness Study (1979) and the Canada Fitness Survey (1983) were two research examples found concluding no significant association between exercise adherence and accessibility to facilities. Nevertheless, it is relevant to mention the lack of literature identifying a negative correlation between geographical proximity and exercise adherence within a built environment. When supervised exercise programs were investigated, several studies uncovered positive association between exercise adherence and access to facilities (Oldrige, 1982; Teraslinna, 1969; Andrew, 1981). In the current studies available, distance and access to facilities were identified as key factors, but exploratory analyses to correlate variables were not found. Literature addressing exercise adherence and its determinants were found, but none used geographic information systems tools or software for the aforementioned purpose.

The Built Environment

The noteworthy rise in obesity is a concern to governmental entities due to the consequent diseases and the corresponding healthcare costs (Department of Health and Human Services, 2004). According to *F as in Fat: How Obesity Policies are Failing in America*, the nation is beginning to recognize obesity as a serious health crisis (Trust for

America's Health, 2009). Researchers are diligently working to identify the most significant factors of a built environment. United States Census Data exemplifies the current rising obesity epidemic and the related trends (Trust for America's Health, 2009). The report co-author, Jeffrey Levi has been stating the importance of individual communities contributing their part in the United States' fight against obesity since previous years when this report was first presented (CNN, 2007).

Recently, built environments have received much attention. Researchers have noted the importance of community strategies to promote healthier choices (Trust for America's Health, 2009). Municipal governments and respective public officials are charged with the responsibility to create an infrastructure conducive to a physically fit community (Trust for America's Health, 2009). Due to the growing health burden, municipal governments must develop and maintain safe, accessible, aesthetic facilities to enhance their built environment. In turn, utilization of facilities will increase activity levels, decrease obesity-related conditions, and result in a positive intervention (Department of Health and Human Services, 2004). No current study has assessed the built environment of the City of McAllen nor examined the significance of geographical proximity to recreational facilities and its impact on the residents' exercise adherence. The resulting evaluation will quantify the City of McAllen's built environment's efficacy.

Environmental Barriers

There are several barriers to physical activity. Barriers to physical activity are defined as reasons people use to defend their lack of exercise. Factors depict a subject's feelings on what prevents them from being more active. Examining each facet encompasses the characteristics of physical activity as well as the social and physical

environment surrounding exercise adherence. Some factors are considered individual barriers such as excessive cost, illness, injury, feeling uncomfortable, lack of skill, or fear (CDC, 2007). Others are considered environmental such as lack of nearby facilities, lack of safe amenities, insufficient programs, lack of transportation, lack of child care and lack of partner. The most common environmental barrier is lack of nearby facilities (Weinberg & Gould, 2007). The investigator will analyze geographical proximity to assess facilities within the chosen built environment.

Physical environmental factors, such as location of facility, consistently exhibit association with physical activity behavior (Humpel, 2002). A review of current literature provides clear empirical support signifying a positive association between accessibility to a facility and physical activity performed (Humpel, 2002). Many environmental determinants of exercise adherence were noted, but among those examined, location and access to facilities, be it a fitness center, pool, or walking trail, had a positive correlation with exercise adherence (Brownson, 2001). The recent rise in number of obese and overweight individuals has been linked to numerous exercise barriers. The government is diligently working to review factors linking environmental barriers to the built environment (Department of Health and Human Services, 2004).

Exercise Adherence

Exercise adherence is defined as the ability of an individual to continue their exercise program. Fifty percent of individuals who begin an exercise program discontinue their regimen during the first six months (Weinberg & Gould, 2007). While exercise adherence is a continual puzzle, research previously done has answered some of the variables in question. Researchers have found a number of positive variables influencing

exercise adherence including: weight control, reduced risk of disease, reduction in stress or depression, mere enjoyment, enhancement of self-esteem and opportunities to socialize. In contrast, negative variables influencing inactivity include: perceived lack of time, lack of energy and/or lack of motivation (Weinberg, 2007). Another factor which may not be as apparent includes psychological processes resulting from school exercise programs in a child's developing years (Sullivan, 1991). These experiences may have had a positive or negative influence; nevertheless, they can play an important role in an individual's desire to exercise as an adult.

Different models have been developed in an attempt to better understand exercise adherence. One example is the transtheoretical model (TM). Originally, the TM was used to understand people's rehabilitation relative to addictive behaviors, but has evolved to play a role in the understanding of exercise adherence. The six stages of TM are (1) precontemplation (2) contemplation (3) preparation (4) action (5) maintenance and (6) termination. These six stages serve to help us understand the phases an individual progresses through in order to incorporate an efficacious new behavior to be permanently adopted and requiring no conscious effort (Guillot, 2004). There are multiple models used for exercise adherence such as *Social-Cognitive* (Bandura, 1977; 1986), *Health Belief Model* (Anshel, 2003), and *Theories of Reasoned Action and Planned Behavior* (Azjen, 1991; Azjen & Madden, 1986). These aforementioned models also seek to understand factors affecting and/or determining exercise adherence.

Summary

The present study seeks to further research the relationship between physical location and exercise adherence. The researcher seeks to elaborate upon the current

findings regarding positive correlation between accessibility to facilities and adherence to exercise. By including a GIS analysis and mapping the hotspots, the findings will exhibit significant results describing the significance between geographical proximity and level of exercise adherence.

CHAPTER 3

METHOD

Introduction

Research studies have shown that approximately 50 percent of individuals who commence a self-monitored exercise program will discontinue participation within six months (Dishman, 1991). The first variable in this study, exercise adherence, was measured using this standard. A high level of adherence was set at 6 months or more. The second variable, geographical proximity was assessed by analyzing the relationship across half-mile radius bands. Multiple regression analysis was utilized to determine correlation between multiple variables. The researcher sought to determine if a significant positive correlation exists between geographical proximity and its effect on the built environment.

Site and Participants

A sample population of 260 participants was surveyed. Participants were 18 years of age or older and were found exercising at each of the three locations chosen by the current study. Random samples of actively engaged participants at three different times on two different days at each location were asked to respond. The investigator only collected data from participants engaging in physical activity and falling under previously stipulated delimitations. In addition, there were no recapture subjects. Once a participant

had answered a survey, even at another location, they were not allowed to repeat the questionnaire.

Conforming to the limitations placed, the investigator selected for participants over 18 years of age and who were not involved with a personal trainer and/or other monitored exercise program. Furthermore, in order to prevent outside visitor data from skewing the statistical analysis, the researcher only surveyed residents from the Rio Grande Valley. The sites selected were McAuliffe Park, 2nd Street Trail and Bill Schupp Park.

Research Design

The current thesis is a descriptive study employing survey methods (Dillman, 2006). A cross-sectional survey research design was used to attain a distribution of traits and attributes for a sample population. The objective was not only to describe the sample population selected, but also to determine relationships across variables (Babbie, 1973). The current study also sought to explore an additional objective in reference to geographical proximity and exercise adherence: Does built environment affect these two variables, and if so, how? Following data compilation, an explanatory assertion was made.

Instrument

A total sample population of 260 participants completed a custom survey. Each survey contained seven questions inquiring about the following units of analysis:

- Age Category
- Gender
- Education Level

- Income Level Category
- Number of times per week respective facility is utilized
- Length of months engaged in present exercise program
- Band Address and Quadrant

The survey questions were on a 5 ½" by 4 ¼" postcard printed on a color laser printer and was titled "Quick Survey" (Figure 5) The City of McAllen logo was included on the card with the city's permission. The simple design and easy-to-read questions made data collection an expedited process.

Data Collection

In the fall of 2008, specifically in the latter part of November and the early part of December, a total of 260 individuals aged 18 years and above were selected from a cluster sample at three different municipal parks or trails. The goal was to survey a population of 90 participants at each of the three parks and/or trails during the three times frames established. On Wednesday and Saturday mornings the research was conducted at 8 a.m. On Wednesday and Saturday afternoons, the chosen time for data collection was 6 p.m. Finally, the time selected for evening data collection was 8 p.m. All but one location was able to supply the total needed. The Saturday evening collection at 2nd Street Trail was low due to lack on trail users on that day and time and the Wednesday morning temperature at Bill Schupp Park was 40 degrees Fahrenheit; hence the planned sample size was not achieved for those two sites. A total of 93 participants were surveyed at McAuliffe Park, 83 were surveyed at 2nd Street Trail and 84 were surveyed at Bill Schupp Park. Individuals were randomly asked to fill out the survey at each location. The participants were approached and the researcher conformed to IRB

standards and read a prepared script asking the participant for confirmation of being 18 years of age or older and consent to participate in the study. If the person approached only spoke Spanish, the script was read in Spanish. Following their consent, the participant was handed a Study Information Sheet in either English or Spanish, depending on their preferred language, and the "Quick Survey" which was then filled out. (See Appendix A for above mentioned documents.)

After the first four demographic questions were answered (age, gender, education level and income level), the participant then indicated the number of times per week they attend the respective facility and how long (in terms of months) they had routinely engaged in exercise. For the last question of the survey, the participant chose a band address and quadrant.

To determine band address and quadrant, the investigator asked the participants to indicate the location of their residence by a pin-pointing procedure. Geographically correct maps, which were previously created by ArcGIS 9.2 Software, were shown to the participant. The researcher then asked the participant to point to where their residence is located on the provided map. Dependent upon where the participant pointed to, they were assigned a band address with a quadrant and asked to circle it on their survey. Each location surveyed had their individual color-coded map (see Appendix B) with radiuses around the respective park or trail location. Each map was specific to each location and delineated the half-mile radius bands around each locale with the following interval distances:

- Less than .5 mile away = 1
- .5 to 1 mile away = 2

- 1 to 1.5 miles away = 3
- 1.5 to 2.0 miles away = 4
- 2.0 to 2.5 miles away = 5
- 2.5 miles or more away = 6

After the participant found the location of their residence, the investigator marked the participant's assigned color-coded number given to describe the day and time the participant was surveyed. Furthermore, the bands were divided into quadrants to better identify the participants' residential geographical location.

The quadrants were established as follows:

- A = Northwest
- B = Northeast
- C = Southwest
- D = Southeast

Each of the locale's respective maps contained anonymous information obtained for both of the days and the three times of day at each locale. This protected the individual's privacy and increased cooperation for the study.

Following the collection of data, statistical analyses were conducted and relationships amongst variables were assessed. The main objective was to observe the parameters and determine the relationship between geographical proximity within the built environment, utilizing each facility's geographical proximity, and frequency of use. Exercise adherence was also observed as a secondary variable in relation to geographical proximity. In addition, demographic variables obtained were also included as part of the exploration to seek relationships in other aspects of the information gathered.

The three different built locations were mapped with six half-mile radius bands assigned around each, totaling a two-and-a-half-mile radius for the three chosen locations. In an effort to collect randomized data, the investigator surveyed a cluster sample at three different times. After organizing the data collected regarding demographics, addresses and exercise regimen details, GIS software was utilized to map the approximate addresses and determine the correlation between geographical proximity and exercise adherence. A multiple regression statistical analysis using a 95% confidence level was conducted to determine significance.

Data Analysis

The researcher utilized ESRI ArcGIS 9.2 Software to analyze the proximity of the facility in reference to the participants' approximate residential address. A qualified GIS Specialist assisted the investigator in performing spatial analyses and managed all the residential band addresses collected from the surveys. After the band addresses were geo-coded and inputted into the computer-analysis GIS software, a cartographically precise map was produced to further analyze the coordinates plotted and their respective hotspots. Each half-mile radius band is distinguished by color and the compiled data informed the investigator the degree of each park or trail utilization at each distance category.

Statistical Applications

The generated data was categorized and statistical significance was determined using a multiple regression test. The information gathered and the data analyses results were used to determine significant positive associations between all of the variables studied. Various categories of data were collected, but the investigator's main focus lied

in the significance of geographical proximity to recreational facilities within the built environment.

In addition to the multiple regression analysis, a spatial analysis extension of ESRI ArcGIS 9.2 software was used to calculate hotspots and any other trends found amongst the bands. A map detailing the spatial distribution of the hotspots within the city of McAllen, Texas is a product of this analysis.

CHAPTER 4

ANALYSIS OF DATA

Introduction

This chapter presents the results of the study in five sections. The first section discusses the investigation. Following the initial overview of the study, each of the three facilities' individual results are discussed using the maps created by the ArcGIS Software. The second section depicts the map and results of the investigation concerning McAuliffe Park. The third section describes the map and results at the second location: Second Street Trail. The fourth section details the third locale's map and results: Bill Schupp Park and Trail. Lastly the fifth section relates data compiled across all three locations and imparts a comprehensive statistical analysis including all three sites surveyed.

The Study

The investigator determined a three-mile radius from each of the identified recreational sites as the catchment vicinity. Six one-half mile bands were used to establish and distinguish distance from the exercise location. Geographical proximity to the exercise location was analyzed to determine if distance from the built exercise environment was significant to those who exercise therein.

McAuliffe Park

The survey results showed 65% of McAuliffe Park users lived within one mile of the park. The McAuliffe Park map can be found in Appendix B on page 42.

Second Street Trail

At 2nd Street Trail, 77% of participants surveyed lived within one mile of the trail. The Second Street Trail map can be found in Appendix B on page 43.

Bill Schupp Park

Participants surveyed at Bill Schupp Park were from several band addresses proving to be outliers in the statistical analyses. Only 46% of users lived within one mile of the park. Those living more than three miles away actually lived in another city. In conversing with participants, the researcher asked why they would come from another city. The investigator found the answer to be consistent. The users described the trail maintenance and surface as the best. The map of Bill Schupp Park can be found in Appendix B on page 44.

Three Locales

The researcher sought to investigate the difference in utilization between those participants living less than one mile away from the recreational facility (Bands 1 and 2) and those living more than one mile away (Bands 3 and beyond).

A correlation matrix was analyzed to evaluate and identify the existence of any relationships among the variables that comprised the data collected in the current study. Correlation coefficients were computed among trail usage frequency, distance of residence from trail, months of consistent trail usage, direction of residence from trail, income level, education level, gender, age, time of day and day of week the trail was

used, and the specific trail. Using the Bonferroni approach to control for Type I error across 55 correlations, a p value of less than .001 (i.e., $p < .05/55$) was required to analyze significance. The results of the correlational analyses presented in Table 1 indicate that 9 out of the 55 correlations were statistically significant ($p < .001$).

TABLE 1: Multiple Regression Results Using Demographic Data

Correlations

		Site	Weekday	Time	Age	Gender	Education	Income
Site	Sum of Squares and Cross-products	176.688	3.188	3.688	2.358	-3.188	57.846	71.259
	Covariance	.682	.012	.014	.009	-.012	.223	.276
	N	260	260	260	260	260	260	259
Weekday	Pearson Correlation	.030	1	-.094	.022	.005	-.098	.018
	Sig. (2-tailed)	.632		.131	.727	.941	.115	.773
	Sum of Squares and Cross-products	3.188	64.688	-9.812	2.858	.312	-14.154	2.896
	Covariance	.012	.250	-.038	.011	.001	-.055	.011
	N	260	260	260	260	260	260	259
Time	Pearson Correlation	.021	-.094	1	-.413**	-.130*	-.129*	-.234**
	Sig. (2-tailed)	.732	.131		.000	.036	.037	.000
	Sum of Squares and Cross-products	3.688	-9.812	168.688	-87.642	-14.188	-30.154	-60.741
	Covariance	.014	-.038	.651	-.338	-.055	-.116	-.235
	N	260	260	260	260	260	260	259
Age	Pearson Correlation	.011	.022	-.413**	1	.045	.112	.377**
	Sig. (2-tailed)	.862	.727	.000		.473	.072	.000
	Sum of Squares and Cross-products	2.358	2.858	-87.642	266.812	6.142	32.769	123.317
	Covariance	.009	.011	-.338	1.030	.024	.127	.478
	N	260	260	260	260	260	260	259
Gender	Pearson Correlation	-.029	.005	-.130*	.045	1	-.085	-.167**
	Sig. (2-tailed)	.647	.941	.036	.473		.171	.007
	Sum of Squares and Cross-products	-3.188	.312	-14.188	6.142	70.688	-12.846	-28.170
	Covariance	-.012	.001	-.055	.024	.273	-.050	-.109
	N	260	260	260	260	260	260	259
Education	Pearson Correlation	.242**	-.098	-.129*	.112	-.085	1	.534**
	Sig. (2-tailed)	.000	.115	.037	.072	.171		.000
	Sum of Squares and Cross-products	57.846	-14.154	-30.154	32.769	-12.846	322.615	191.653
	Covariance	.223	-.055	-.116	.127	-.050	1.246	.743
	N	260	260	260	260	260	260	259
Income	Pearson Correlation	.268**	.018	-.234**	.377**	-.167**	.534**	1
	Sig. (2-tailed)	.000	.773	.000	.000	.007	.000	
	Sum of Squares and Cross-products	71.259	2.896	-60.741	123.317	-28.170	191.653	401.537
	Covariance	.276	.011	-.235	.478	-.109	.743	1.556
	N	259	259	259	259	259	259	259
Frequency	Pearson Correlation	-.002	-.099	-.058	.321**	.027	.067	.190**
	Sig. (2-tailed)	.978	.110	.348	.000	.665	.282	.002
	Sum of Squares and Cross-products	-.273	-9.773	-9.273	64.165	2.773	14.692	46.483

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The results indicate that in four of the cases income has a statistically significant correlation with education, age, time of day one uses the trail, and specific trail. Frequency of trail usage had a significant positive correlation with income level and with age. The remaining three significant correlations occurred between the geographic direction from the trail and income, education level and the specific trail, and the time of day the trail was used and the user's age.

In order to specifically test the hypothesis that proximity of one's residence to a trail correlates with usage of that trail, a specific test of this relationship was performed. Results from the data culled for the current study provided support for this hypothesis ($r = -.17, p < .01$). However, the proximity to a trail and the number of continuous months the trail is used did not show a significant correlation ($r = -.10, p = .87$).

Following the correlation analysis a number of regression analyses were performed. First, a bivariate linear regression was performed to evaluate how proximity predicted the frequency of trail usage. Congruent with the results reflecting a significant correlation between residence distance from trail and frequency of trail usage, the results show the two variables are linearly related such that as overall distance decreases the frequency of trail usage increases. The regression equation for this relationship is:

$$\textit{Frequency of Trail Usage} = -.073\ \textit{Distance of Residence from Trail} + 2.27$$

The 95% confidence interval for the slope, -1.24 to -.022 does not contain the value of zero; therefore, distance is significantly related to the frequency of trail usage, as hypothesized. However, the amount of the variance accounted for in frequency by residential distance was small. Since the correlation between these two variables is -.17,

approximately 3% of the variance in frequency of trail usage is accounted on distance to the trail. In order to evaluate the possibility of other factors accounting for additional portions of the variance, further multiple regression analyses were performed.

The first multiple regression analysis added the variable quadrant to test whether or not the addition of the factor of geographic direction one's residence is from the trail improved the accuracy of the original bivariate regression equation. To evaluate this, the change in R^2 of the multiple regression over the original bivariate regression was identified, $R^2 = .016$. Since R^2 is $< .02$ it was decided that the addition of the geographic direction of one's residence from the trail did not make a significant contribution to a better fit of the regression equation with the data.

A second multiple regression that grouped predictor variables was analyzed for its ability to significantly explain the frequency of trail usage. This evaluated how well the criterion (i.e., frequency of trail usage) was predicted by the location of the trail relative to residences (i.e., zone and quadrant; Set 1), demographic factors (i.e., age, gender, education level, and income; Set 2), and ordinal factors (i.e., the site itself, day of the week, and time of day; Set 3). The relationship between frequency and the Set 1 factors was significant, $R^2 = .05$, adjusted $R^2 = .04$, $F(2, 255) = 6.07$, $p < .01$. The Set 2 factors predicted significantly above the Set 1 factors, R^2 change $= .09$, $F(4, 251) = 6.51$, $p < .01$. When the Set 3 factors were added to the regression equation the R^2 change $= .01$, $F(3, 248) = 1.37$, $p = .25$, which clearly does not improve the regression equation created by Set 1 and Set 2 factors (i.e., R^2 change $< .02$ and $p > .05$).

A final prediction equation evaluated factors most salient to frequency of trail usage (a) distance from trail (b) age (c) income. All of these have significant correlation

coefficients with frequency of trail usage. However, in the interest of parsimony, it was decided to exclude income as there is sufficient research to support that as people get older their incomes rise (Liu, 2007). The resultant regression equation is:

$$\textit{Frequency of Trail Usage} = -.054\ \textit{Distance of Residence from Trail} + .225\ \textit{Age} + 1.69$$

The 95% confidence interval for the slope of distance of residence from trail is -0.103 to -.004, while the same for age is 0.138 to .312, neither of which contains the value of zero, and therefore are significantly related to the frequency of trail usage, as hypothesized. However, the amount of the variance accounted for in frequency by residential distance also was small with this regression equation. Since the correlation between the two predictor variables and the criterion is .35, approximately 12% of the variance in frequency of trail usage is accounted for by how close one lives to the trail and the individual's age. Essentially this means frequency of trail usage is a function of distance to the trail (as distance to trail decreases, frequency of trail usage increases) and age (as age increases, frequency of trail usage increases), plus a constant. Statistical analyses were performed to identify the strength of the relationship between the predictor variable (distance from the trail) and the criteria variables (a) the number of times per week the trail is used and (b) the number of months the participant historically has used the trail. In the former case (distance and frequency per week), there was a statistically significant correlation ($r = -.17, p < .01$). However, in the latter case when correlation between distance and historical use of recreational facility over time (measured in months) was analyzed, statistical significance was not found ($r = -.01, p = .87$).

After the initial analyses, a more comprehensive analysis was performed. The purpose of this was to uncover strength of correlation across other variables in relationship to distance from the trail and the participants' number of uses per week. In addition to the predictor and criteria variables, the environmental data (i.e. trail, day of the week and time of day) as well as the demographic data (i.e. participants' ages, gender, education and income level) were incorporated to further understand the relationship any of these had with the criteria variables of interest. Table 2 analyzes environmental data.

TABLE 2: Multiple Regression Results using Environmental Factors

Correlations

		Frequency	Months	Zone	Quadrant
Site	Sum of Squares and Cross-products	-.273	46.315	64.761	-21.165
	Covariance	-.001	.187	.251	-.082
	N	260	260	259	260
Weekday	Pearson Correlation	-.099	.021	.149*	-.042
	Sig. (2-tailed)	.110	.730	.016	.504
	Sum of Squares and Cross-products	-9.773	3.315	34.525	-5.665
	Covariance	-.038	.013	.134	-.022
	N	260	260	259	260
Time	Pearson Correlation	-.058	-.139*	-.027	.072
	Sig. (2-tailed)	.348	.025	.661	.247
	Sum of Squares and Cross-products	-9.273	-34.685	-10.239	15.835
	Covariance	-.036	-.134	-.040	.061
	N	260	260	259	260
Age	Pearson Correlation	.321**	.255**	-.152*	-.075
	Sig. (2-tailed)	.000	.000	.015	.227
	Sum of Squares and Cross-products	64.165	79.823	-71.309	-20.773
	Covariance	.248	.308	-.276	-.080
	N	260	260	259	260
Gender	Pearson Correlation	.027	-.070	.027	.033
	Sig. (2-tailed)	.665	.260	.668	.599
	Sum of Squares and Cross-products	2.773	-11.315	6.475	4.665
	Covariance	.011	-.044	.025	.018
	N	260	260	259	260
Education	Pearson Correlation	.067	.199**	.028	-.064
	Sig. (2-tailed)	.282	.001	.654	.302
	Sum of Squares and Cross-products	14.692	68.538	14.417	-19.538
	Covariance	.057	.265	.056	-.075
	N	260	260	259	260
Income	Pearson Correlation	.190**	.341**	.086	-.191**
	Sig. (2-tailed)	.002	.000	.169	.002
	Sum of Squares and Cross-products	46.483	131.143	49.442	-64.745
	Covariance	.180	.508	.192	-.251
	N	259	259	258	259
Frequency	Pearson Correlation	1	.319**	-.173**	-.132*
	Sig. (2-tailed)		.000	.005	.033
	Sum of Squares and Cross-products	149.304	74.931	-60.637	-27.281

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Significance was determined ($R^2 = .11$, adjusted $R^2 = .10$, $F(4, 254) = 7.73$, $p < .01$). The regression equation with the environmental data was not significant, $R^2 = .02$, adjusted $R^2 = .01$, $F(3, 255) = 1.45$, $p = .23$. Based on these results, the demographic data appear to be better predictors of the frequency of use of the trails.

Based on the findings of the investigation, the following null hypotheses were rejected:

1. There is no difference between groups living near the recreational facility (established at less than one mile radius) and those living further away (more than one mile radius) in frequency of use per week

2. There is no difference between groups living near the recreational facility established at less than one mile radius) and those living further away (more than one mile radius) in exercise adherence

CHAPTER 5

SUMMARY, FINDINGS, CONCLUSIONS and RECOMMENDATIONS

Summary

The purpose of the study was to determine significance between municipal built environments and physical activity frequency and adherence. In exploring the City of McAllen's built environment, we were able to demonstrate the effectiveness of its infrastructure and how conducive it is to prompt physical activity. Although external personal factors act as barriers to exercise, the scope of this study was limited to examining the environmental factors affecting frequency of facility usage and exercise adherence. Geographical proximity, specifically distance from an individual's residence to identified City of McAllen recreational facilities and frequency of use, helped assess the effectiveness of the City of McAllen's built environment.

Furthermore, this study examined the environmental barrier of distance in conjunction with degree of adherence by examining the correlation between geographical proximity and history of exercise, among McAllen residents. By investigating current frequency of use per week and history of use over the past months, years in some cases, correlations between geographical proximity, utilization and level of exercise adherence were found. This study served to evaluate the habits of active participants and their use of the chosen recreational areas. The results for this study can serve municipal

governments with assessment of utilization and efficacy of existing parks and trails and in determining future locations.

Findings

Although demographic variables were better predictors of frequency and history of use in terms of months, there were other significant findings enabling us to understand user origin. The investigator had posed the following research questions:

1. How does distance to a recreational facility affect weekly frequency of use?
2. How does distance to a recreational facility affect level of exercise adherence?
3. What demographic variables are indicators of frequent use and exercise adherence?

After the collection and analysis of data, the GIS Maps exemplified the effect of distance as a factor. Sixty-five percent of users at McAuliffe and seventy-eight percent of users at Second Street Trail were within a one-mile radius. The Bill Schupp users had a different scheme because users spanned all the bands in the city and beyond. Nevertheless, these finding do not necessarily imply frequency of use at each of the facilities. A deeper investigation was required. After careful examination of statistical analyses and information gathered from Arc GIS maps created, the investigator determined an important phenomenon. Although the statistical analysis did not show a significant correlation, the maps exemplified the importance of proximity in exercise frequency and adherence. The sample was extremely homogenic; thus, statistical analyses were not able to determine a correlation. Most subjects lived near the facilities studied as well as visited them often and consistently; therefore, a linear relationship could not be established resulting in low correlation between predictor variables. The

study did establish distance as a factor responsible for predicting consistent use three percent of the time among those surveyed. Furthermore, demographic variables such as age and income level did show a significant correlation and proved to be a better predictor of exercise adherence within this study. While zone and quadrant exhibited significant correlations with frequency of attendance, exercise adherence had higher correlations with age, education level and income due to the aforementioned factors. Based on the findings, both null hypotheses were rejected.

Conclusions

The findings enabled the investigator to inform municipal governments about the uncovered relationship between increased opportunities for fitness and exercise adherence. The investigator was able to uncover strong support to encourage municipalities to increase opportunities for exercise within communities. The convenient sample surveyed had a high degree of homogeneity; nevertheless, the investigator was unable to reject the null hypothesis due to the fact that in sum total 63% of all participants surveyed lived less than one mile away, further solidifying high utilization is highly related to geographical proximity. The investigator was able to statistically prove demographic variables are better indicators of higher probability for exercise adherence. In addition, it exemplified having a built environment with facilities near residential areas will increase user participation. These findings further solidify previous research noting a city offering multiple fitness-oriented facilities within their built environment results in higher levels of fitness (Pinzon-Perez, 2007).

Recommendations for Municipalities

The investigator wishes to impact our local society and encourage municipal governments to increase the number of parks, walking and biking trails, as well as any other recreational facilities to create a built environment conducive to physical activity. Consequently increased opportunities for exercise will be created therefore encouraging physical activity and decreasing the number of sedentary residents, high incidence of obesity and the consequences attributed with inactivity.

Recommendations for Future Studies

Due to the methods used in surveying subjects, the sample in this study, was highly homogenic; therefore, the researcher recommends a random sample for future investigations. Surveying a random sample of residents of McAllen in lieu of only park and trail users, would decrease the homogeneity of the sample and provide a better representation of the city's population.

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APPENDIX A

Consent Scripts & IRB Forms

CONSENT SCRIPT

"Hello, my name is Nancy Anzaldua. I am a researcher at the University of Texas – Pan American. We are conducting a research study about McAllen Hike and Bike Trails. Would you mind completing a short survey? It should take about 1 minute of your time. Your responses are confidential; any individually identifiable responses will be securely stored and will only be available to those directly involved in this study. We ask that you try to answer all questions. However, if there are any questions that you would prefer to skip, simply leave the answer blank.

Thank you for agreeing to participate. Are you at least 18 years of age?"

PROVIDE THEM WITH A COPY OF THE SURVEY AND A STUDY INFORMATION HANDOUT (shown below).

ESCRITURA DE CONSENTIMIENTO

"Buenas tardes/Buenos dias, disculpe que la/lo moleste. Me llamo Nancy Anzaldua y soy una estudiante de la Universidad de Texas-Pan Americana y estoy llevando acabo un estudio. Estamos investigando demograficas referente a los Parques y Pistas de Caminar en la Ciudad de McAllen. Podria participar en nuestra encuesta? Solamente se llevara 1 minuto de su tiempo. Sus respuestas son completamente confidenciales ; todas las respuestas seran guardadas bajo llave y solo las personas participando directamente con nuestro estudio tendran acceso. Le pedimos porfavor que intente contestar todos las preguntas. Sin embargo, si hay preguntas que usted prefiere no contestar, simplemente dejelas en blanco.

Gracias por participar. Es usted mayor de 18 anos de edad?"

DAR COPIA DE ENCUESTA E HOJA DE INFORMACION SOBRE EL ESTUDIO (mostrado abajo)

Research Study Information Sheet

(Please keep this information for your reference)

Study Title: Built Environment: Demographics of McAllen Hike and Bike Trails

Researcher contact information:	Name:	Nancy Anzaldua
	Title:	Graduate Student
	Dept:	Health and Kinesiology The University of Texas-Pan American
	Phone:	(956) 380-8745
	Email:	nanzaldua@broncs.utpa.edu
Faculty advisor contact information:	Name:	Dr. Paul Villas
	Dept:	Health and Kinesiology The University of Texas-Pan American
	Phone:	(956) 380-8745
	Email:	pvillas@utpa.edu

This research has been reviewed by the Institutional Review Board for the Protection of Human Subjects (IRB). If you have any questions about your rights as a participant, or if you feel that your rights have been violated, please contact the IRB at 956-384-5004

Pagina de Informacion Referente al Estudio

(Porfavor guarde esta pagina para su uso)

Titulo del Estudio: Infrastructura (Medio Ambiente): Demograficas de los Parques y Pistas de Caminar en McAllen

Informacion del Investigador:

Nombre:	Nancy Anzaldua
Titulo:	Estudiante Post-Grado
Depto:	Salud y Kinesiologia
	La Universidad de Texas-Pan Am
Telefono:	(956) 380-8745
Correo Elec.:	nanzaldua@broncs.utpa.edu

Informacion del Profesor Supervisando:

Nombre:	Dr. Paul Villas
Depto:	Salud y Kinesiologia
	La Universidad de Texas-Pan Am
Telefono:	(956) 380-8745
Correo Elec.:	pvillas@utpa.edu

Este estudio ha sido revisado por el Institutional Review Board for the Protection of Human Subjects (IRB). Si usted tiene preguntas sobre sus derechos como participante, si usted siente que sus derechos han sido violados, por favor llame al IRB (956) 384-5004.

City of McAllen

Quick Survey

Park ___
Time ___
Day ___
Part # ___

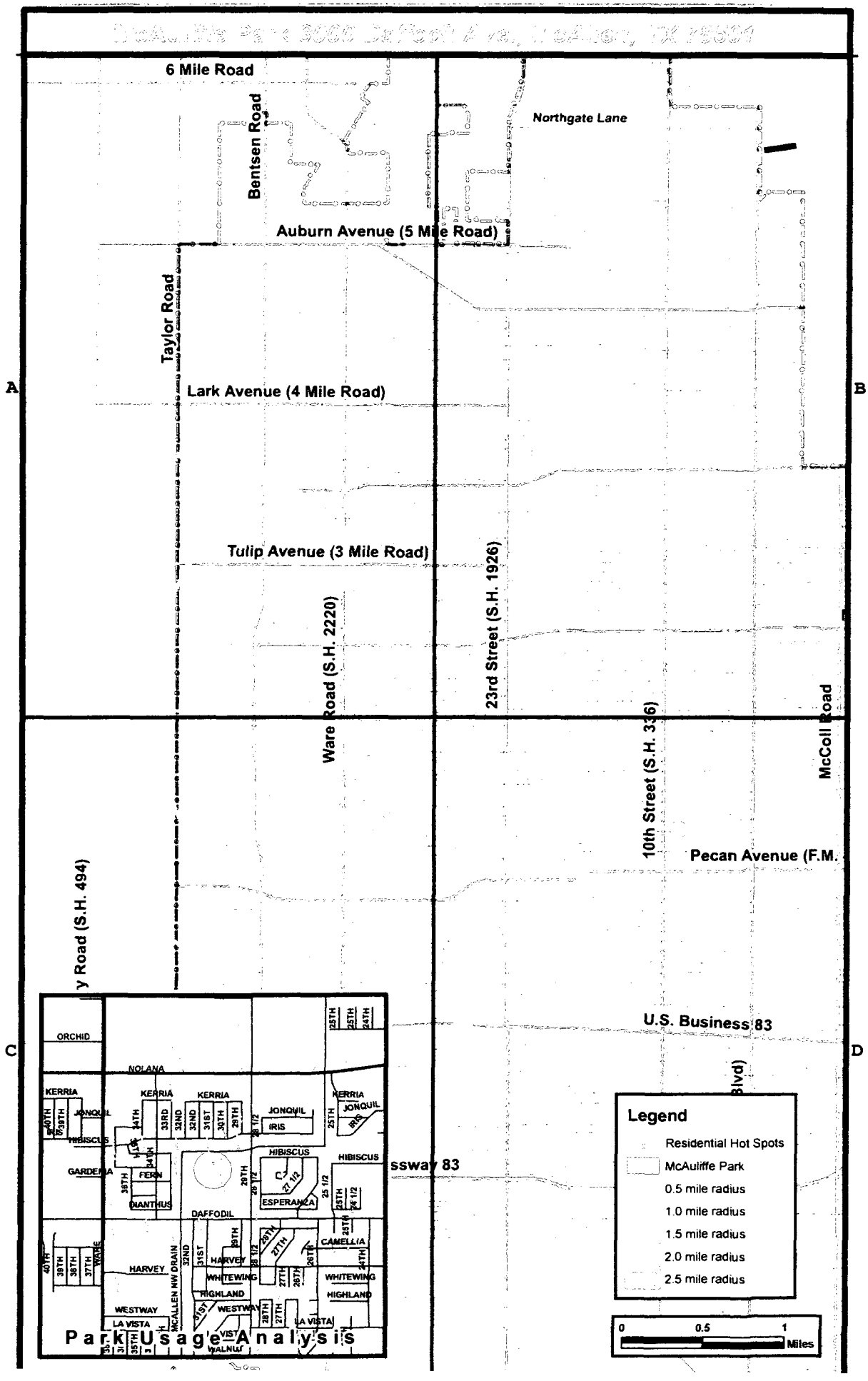
Please circle the appropriate responses.

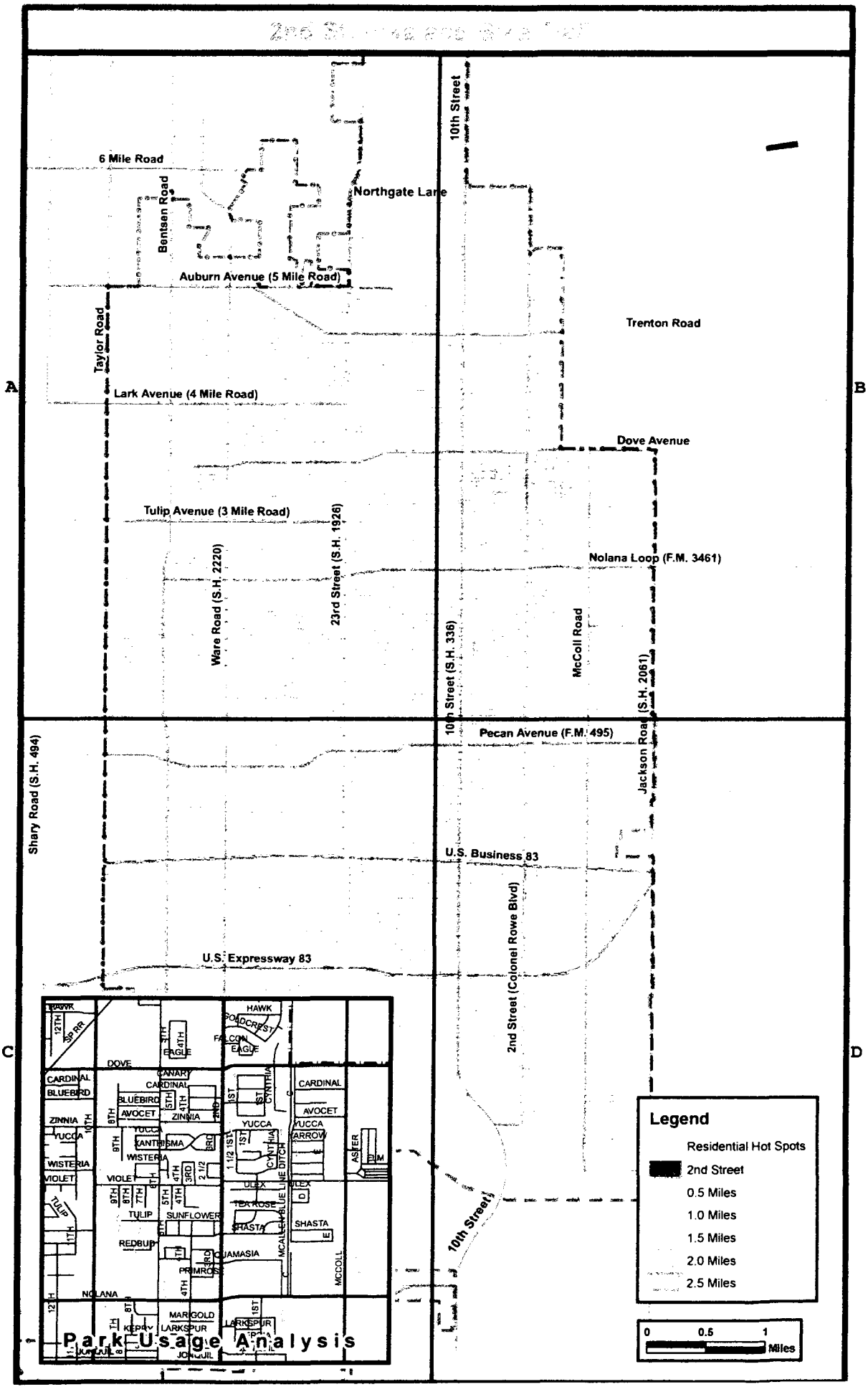
1. **Age** 18-25 26-40 41-55 56-80 81+
2. **Gender** M F
3. **Education Level** H.S. Some College College Graduate
4. **Income Level** <15,000 15,001-30,000 30,001-45,000 45,000+
5. **Times per week you attend this facility?** 1-2 3-4 5+
6. **How long have you been in a consistent exercise program?**
   Less than 2 mos. 2-4 mos. 4-6 mos. 6 mos. +
7. **Band Address** 1 2 3 4 5 6
   Quadrant A B C D

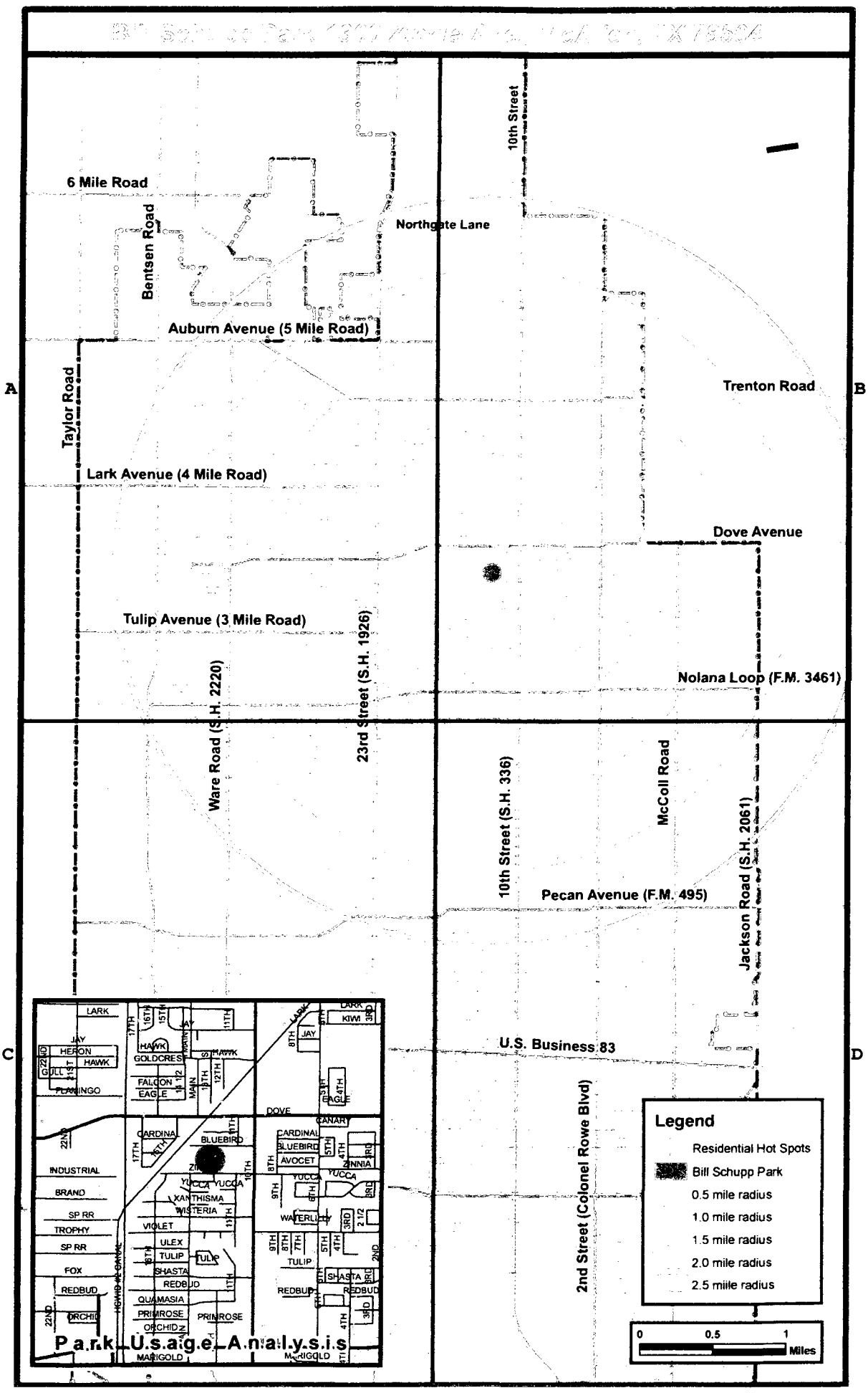
Thank you for your time!

APPENDIX B

MAPS


6 Mile Road
Bentsen Road
Northgate Lane
Auburn Avenue (5 Mile Road)
Taylor Road
Lark Avenue (4 Mile Road)
Tulip Avenue (3 Mile Road)
Ware Road (S.H. 2220)
23rd Street (S.H. 1926)
10th Street (S.H. 336)
McColl Road
Pecan Avenue (F.M.
y Road (S.H. 494)
U.S. Business 83
Blvd)
ssway 83
A
B
C
D
Park Usage Analysis
Legend
Residential Hot Spots
McAuliffe Park
0.5 mile radius
1.0 mile radius
1.5 mile radius
2.0 mile radius
2.5 mile radius
0
0.5
1
Miles


6 Mile Road
Bentsen Road
Northgate Lane
10th Street
Auburn Avenue (5 Mile Road)
Taylor Road
Trenton Road
Lark Avenue (4 Mile Road)
Dove Avenue
Tulip Avenue (3 Mile Road)
Ware Road (S.H. 2220)
23rd Street (S.H. 1926)
Nolana Loop (F.M. 3461)
10th Street (S.H. 336)
McColl Road
Jackson Road (S.H. 2061)
Pecan Avenue (F.M. 495)
Shary Road (S.H. 494)
U.S. Business 83
2nd Street (Colonel Rowe Blvd)
U.S. Expressway 83
A
B
C
D
Park Usage Analysis
Legend
Residential Hot Spots
2nd Street
0.5 Miles
1.0 Miles
1.5 Miles
2.0 Miles
2.5 Miles
0
0.5
1
Miles


6 Mile Road
Bentsen Road
Northgate Lane
10th Street
Auburn Avenue (5 Mile Road)
Taylor Road
Trenton Road
Lark Avenue (4 Mile Road)
Dove Avenue
Tulip Avenue (3 Mile Road)
Ware Road (S.H. 2220)
23rd Street (S.H. 1926)
Nolana Loop (F.M. 3461)
10th Street (S.H. 336)
McColl Road
Jackson Road (S.H. 2061)
Pecan Avenue (F.M. 495)
U.S. Business 83
2nd Street (Colonel Rowe Blvd)
A
B
C
D
Park Usage Analysis
Legend
Residential Hot Spots
Bill Schupp Park
0.5 mile radius
1.0 mile radius
1.5 mile radius
2.0 mile radius
2.5 miile radius
0
0.5
1
Miles

APPENDIX C

MONTH AND ZONE FREQUENCY TABLES

FREQUENCY TABLES

Months

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	45	17.3	17.3	17.3
	2	33	12.7	12.7	30.0
	3	21	8.1	8.1	38.1
	4	161	61.9	61.9	100.0
	Total	260	100.0	100.0	

Zone

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	111	42.7	42.9	42.9
	2	52	20.0	20.1	62.9
	3	28	10.8	10.8	73.7
	4	20	7.7	7.7	81.5
	5	12	4.6	4.6	86.1
	6	36	13.8	13.9	100.0
	Total	259	99.6	100.0	
Missing	System	1	.4		
Total		260	100.0		

Months

4	73	33	15	10	7	23
3	4	6	2	5	2	2
2	14	6	3	3	3	4
1	20	8	8	2	0	7
	1	2	3	4	5	6

Zone

APPENDIX D

CITY OF McALLEN PARKS AND RECREATION SURVEY

City of McAllen Parks & Recreation Department

Hike and Bike Trail Survey Results 2008

1	Which of the following activities do you engage in at the trails?		
	Walk	162	78%
	Run	90	43%
	Bike	38	18%
	Train for Event	8	4%
	Rollerblade	4	2%
	Skateboard	2	1%
	Other	12	6%
2	Do you use the trails for		
	Pleasure	98	47%
	Health	182	88%
	Socializing	30	14%
	To Commute	3	1%
	Work	4	2%
	Shopping	1	0%
	School	1	0%
3	How long have you used the trails?		
	<6 months	62	30%
	6 mos.-1 year	33	16%
	1-2 yrs	43	21%
	3+ years	65	31%
4	What McAllen trails do you use?		
	Bill Shupp	87	42%
	La Vista	21	10%
	McAuliffe	70	34%
	2nd Street	94	45%
	Bicentennial	24	12%
5	How often do you use the trails?		
	1-2x/wk	60	29%
	3-4x/wk	80	38%
	5-6x/wk	30	14%
	Everyday	37	18%
6	How long is each trail outing?		
	<30 min.	27	13%
	30-45 min.	54	26%
	45-60 min.	70	34%
	>1 hour	66	32%

8	Do you feel safe on the trails?		
	Yes	198	95%
	No	20	10%
11	Has the trail added quality of life?		
	Yes	208	100%
	No	3	1%
12	Are restrooms important to have along the trails?		
	Yes	174	84%
	No	31	15%
13	How often do you think rest stops are needed?		
	<1 mile	75	36%
	1-2 miles	86	41%
	3-4 miles	25	12%
	4+ miles	14	7%
14	What would you like to have at the rest stops?		
	More shade	80	38%
	More water fountains	119	57%
	Picnic tables	36	17%
	Other	17	8%
15	Is the lighting on the trails adequate?		
	Yes	107	51%
	No	86	41%
17	How do you get to the trails you frequent?		
	Drive	122	59%
	Walk	94	45%
	Bike	23	11%
	Skate	0	0%
	Other	4	2%
18	What surface do you like better?		
	Asphalt	34	16%
	Concrete	116	56%
	Granit	9	4%
	Gravel	54	26%
	Dirt	22	11%
	Grass	26	13%
21	Do you use the trail with friends and/or relatives?		
	Yes	193	93%
	No	17	8%

22	Do you use the trails with your dog?			
	Yes		75	36%
	No		132	63%
23	Do you look at birds along the trail?			
	Yes		155	75%
	No		57	27%
25	For those walking or jogging, do you feel in danger by those biking?			
	Yes		65	31%
	No		131	63%
26	Are emergency phone stations needed at mile intervals?			
	Yes		151	73%
	No		56	27%
27	Are maps or trail markers needed for your convenience?			
	Yes		126	61%
	No		81	39%
28	Do you use other parks and/or recreation facilities regularly?			
	Yes		79	38%
	No		128	62%
29	Have you visited trails in other cities?			
	Yes		117	56%
	No		91	44%
30	Do you like the trails' art additions?			
	Yes		148	71%
	No		27	13%
	No Preference		32	15%
31	Have trails influenced certain purchases?			
	Yes		113	54%
		Bike	31	15%
		Skates	15	7%
		Food	63	30%
		Apparel	67	32%
		Other	9	4%
	No		83	40%
33	Do you find the trails to be clean and well maintained?			
	Yes		186	89%
	No		23	11%

34	Are there enough drinking fountains?		
	Yes	90	43%
	No	116	56%
35	Do you use the trails at night?		
	Yes	144	69%
	No	63	30%
37	Do you feel safe crossing street intersections?		
	Yes	147	71%
	No	55	26%
38	Is there enough parking at trailheads?		
	Yes	124	60%
	No	85	41%
39	Is there enough signage/mile markers?		
	Yes	74	36%
	No	129	62%
40	Did the trails influence your choice of where to live or buy your house?		
	Yes	85	41%
	No	119	57%

END of survey

BIOGRAPHICAL SKETCH

Nancy Anzaldua attended South Texas High School for Health Professions. After graduating with Honors, she attended Texas State University in San Marcos were she received two Bachelor's Degrees Suma Cum Laude in May 2003. The author fulfilled a dietetic internship and practices as a Nutritionist with her Bachelor's of Science in Nutrition and Foods. With the Bachelor's of Science in Exercise and Sports Science she pursued a Master's in Kinesiology at University of Texas-Pan American while she worked as a Graduate Teaching and Research Assistant.

The author is currently working at the University of Texas-Pan American in Edinburg, Texas at the Health and Kinesiology Department. She is also a Nutritionist at a gastroenterologist's clinic in Mission, Texas.

In December 2008 she attended the TAHPERD Conference in Corpus Christi, Texas as a presenter. In June 2009, she co-authored a study presented in El Paso, Texas at the United States-Mexico Border Health Conference.

In August 2009 the author will be conferred as a Masters Graduate, at the University of Texas-Pan American in Edinburg, Texas.

Other professional accomplishments include various fitness certifications, owning her own personal training and fitness studio and the title of WEFNA Master Trainer to teach others certifications. The author also records a weekly television segment where she speaks of Nutrition and Fitness on a local Hispanic channel.

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