

Economic Impacts of Montgomery County's Parks

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Executive Summary

This project's goal is to analyze how the presence and quality of local parks and open spaces affects adjacent property values and the local economy, and to gauge the public perception of parks in Montgomery County to better understand public opinion and concerns surrounding parks. This project will also recommend how those concerns can be addressed to make stakeholder groups more likely to support the activities of the County's Department of Parks.

We assessed opinions of property owners, businesses, developers, and residents in Montgomery County and beyond through on-line and in person surveys. Respondents were asked to assess park amenities by personal preference, state their willingness to pay a premium to live and work near a public park, and share other information on their perceptions of public green spaces in their area.

Using these survey results as well as literature reviews, we found a trend of increasing property values near parks, a perception of increasing business activity due to the presence of parks, and an increased attraction of visitors and residents to an area because of parks. We also determined that parks benefit the natural ecosystem in a way that offers significant monetary value and that can benefit the local economy in the form of saved public utility costs and personal health benefits. The surveys also provided information on trends in public opinion about parks. The most favored park amenity was paved trails, while the least favored amenity was skateparks. Overall, respondents' opinions were quite positive and any concerns they had were related to safety in parks.

Our research and surveys enabled us to determine four distinct recommendations for the Department of Parks. The first is to implement popular amenities. The surveys showed that paved trails were the most popular amenity, followed by family-oriented activities and dog parks, and these amenities can greatly help to generate a more positive perception of parks.

The second recommendation is to create educational programs to help people better understand the economic and social benefits parks can provide, especially their benefits to the natural ecosystem. When people better understand those benefits, they will be less likely to oppose new park plans.

The third recommendation is to continue to develop a safe atmosphere within parks. One of the main concerns is that parks can foster crime, so if the Department of Parks were to heavily advertise their safety measures, such as displaying signs about security camera systems or advertising that the parks are under constant surveillance, people may feel safer and be less concerned about a park in their neighborhood.

Finally, more surveys should be conducted. By continuing to survey the public's perception of their parks, the Department will be able to tailor services to residents and visitors as preferences and demographics change. We believe that following these suggestions will increase the economic benefits of parks in Montgomery County.

Description of Problem

One of the main goals of the Montgomery County Department of Parks is to provide publicly accessible parks, open space, and recreational opportunities that support healthy lifestyles for County residents and visitors. However, some Montgomery County residents worry that parks reduce the property values of homes and businesses, foster crime, and cost tax dollars to maintain. Property owners and developers resist proposed parks and open spaces on private property because they fear the creation of a “black cloud” that could limit the ability for new development.

However, they may not understand how much parks and open spaces can benefit a community. Parks provide social, environmental, and economic benefits that can greatly increase the welfare of a community.

Key Goals and Objectives

This project’s main objective is to assess the economic impacts of parks and public green spaces in Montgomery County. We hope this information will help the Department of Parks garner the necessary support for new parks and open spaces throughout the County. The Department has stated their desire to determine concerns people have about parks and ways to address these concerns and potential problems so that the public will support the work of the Parks Department.

Our goal is to assist the Department with surveys of local property owners, visitors, developers and businesses to gauge public perception of parks. The survey findings and background research are the basis for recommendations that we believe will increase visitation, create more attractive open spaces, garner more public support, and generate more of the economic benefits that parks provide.

Background Research

Before conducting surveys to gauge the public perception of County parks, we obtained background information and research that help us better understand the Department of Parks’ concerns. We also wanted to understand why property owners and developers may be concerned about living or developing next to a park. To do this, we researched the impact of parks on property values, on the local economy, and on natural ecosystems, as well as the importance of park amenities and safety. We also looked at public documents about the current public perception of parks.

Property Value

Figuring out how parks interact with their surrounding neighborhoods involves assessing the details of each park and community. To simplify the relationship, we divided a park’s impact on property value into two categories. The first category is the park’s existential value, defined as the value gained by all community members, no matter how often they use the park, or whether they use the park at all. An example of this type of benefit is hedonic pricing value, where proximity to a public park as an

amenity can be isolated as a positive factor on property values. Another example is the value accrued by the community from ecosystem services that a green space provides. These benefits are provided by public park space at all times, and are enjoyed by residents regardless of personal preference or park usage. John Crompton and Sarah Nicholls of Texas A&M University and Michigan State University, respectively, conducted research on the effects of green spaces on property values, and dubbed this effect, “The Proximate Principle” (2005). This principle “...suggests that the value of a specified amenity is at least partially captured in the price of residential properties proximate to it” (Nicholls & Crompton, 2005). This is an important concept in determining the effect of parks on the surrounding community.

The second category of benefit from public parks is direct usage value, which is the value gained by residents from their personal use of park facilities (Trust for Public Land, 2009). These values are specific, and are tailored not just to a resident’s personal preferences and park use, but also to the availability of certain public park amenities. For example, they could include saved costs from free exercise space, free playground and sports facility space, and the health benefits from being in a natural green setting.

In a 2009 study, the Trust for Public Land also sought to quantify benefits of public park spaces in metropolitan areas, highlighting Washington, DC, Boston, and Philadelphia, among others. In reviewing studies of public park benefits, the Trust found impacts on property values that ranged from a negative 5% effect in the surrounding 500 feet to a positive 15%. The Trust averaged those values, and conservatively estimated a positive 5% effect on surrounding property values. This study will use the same due to the overwhelmingly positive survey responses from both residents and developers.

Multiplying the current County median home price of \$469,400 by the estimate of +5%, and then by the County’s average effective annual property tax rate of 0.93% indicates an estimated benefit of \$219.21 per household that can be tied to parks’ impact on property value.

Direct usage value can be added on top of the existential value, but will be assessed in very different ways, depending on a property’s distance from a park, as well as a park’s size and features. The Trust for Public Land calculated average values per park visit for individuals based on the type of amenities used. The single use values were calculated using 2006 figures, so they are converted here from January 2006 dollars into October 2017 dollars using the CPI calculator provided by the Bureau of Labor Statistics.

For features like playgrounds, trails, dog walking, and picnicking, a single use value of \$1.91 was calculated, translating to \$2.38 in October 2017 dollars. Sports facilities for individual and team sports, a single use value of \$3.05 was calculated, translating to \$3.79 in October 2017 dollars. For special events like festivals and concerts, a single use value of \$9.33 was calculated, translating to \$11.61 in October 2017 dollars (Trust for Public Land, 2009). These values are clearly worth paying for, but are much more difficult to quantify in the County, due to the varied characteristics of each park facility and neighborhood.

Economic Value

To understand the economic impacts of parks on their surrounding areas, we reviewed research papers or books and official reports. Some of the reports were published by parks departments, such as the Chicago Park District, and outlined the revenue and economic impact of a park system within a given year. Others were published by organizations such as the National Recreation and Park Association. Many

reports came from the Trust for Public Land, either as individual research summaries or in collaboration with city park departments.

Based on this research, which covers almost half a century, parks not only boost adjacent property values, but also benefit the local economy in other ways. Parks boost business activity and attract more residents and visitors to an area. By increasing the residential quality of life, both businesses and residents are attracted to come and to stay.

A 1997 study found that quality of life was the main reason that 174 small-business owners had moved to or started in Colorado, and that parks and recreation (along with their amenities) were the most important factor in their choice of location. Small business owners an important segment of the economy, including 45 percent of all US payroll and 97 percent of exporters in 2004 (Gies 2009). Even large businesses have analyzed quality of life as a location factor. In 2001, Boeing chose Chicago over Dallas and Denver for a new headquarters due to its higher quality of life (Sherer 2006).

Because of this, many cities have attempted to implement dramatic park projects and renovations to boost the economy. For example, after New York City's Bryant Park underwent a thorough renovation, adjacent property values, the number of nearby residents, and businesses revenues all increased. There seem to be very few economic downsides to both implementing and renovating parks and open spaces (Sherer 2006).

Ecosystem Services

The economic impacts of parks were also assessed by analyzing the effects of ecosystem services from urban parks to determine whether ecosystem services have economic benefits. To provide evidence that ecosystem services can provide benefits to residents around urban parks, we compiled information from previous studies that put an intrinsic or monetary value on ecosystem services.

The peer reviewed journals and scholarly articles explained the different ecosystem services that urban parks offer, what intrinsic values they hold, and how to put a monetary value on each service. The research showed that ecosystem services can provide many intrinsic values and even monetary values. There are four main divisions of ecosystem services: provisioning, supporting, cultural, and regulating services.

Provisioning and supporting ecosystem services provide clean water, habitat, biodiversity, soil formation, and food. The cultural ecosystem services captures intrinsic values such as recreation, education, aesthetics, and stewardship. It is difficult to put a price on these values, but they are important to the community. Lastly, regulating ecosystem services provide flood control, stormwater reduction, pollution control, and air quality and temperature regulation.

Regulating services were studied at 25 different sites in the U.S. and Canada, and it was found that parks help save between \$3,212 USD to \$17,772 USD with an average of \$9,701 USD per hectare per year. This study did not include money saved by positive health effects because each site is different, but there are significant benefits to human health as well.

Amenities

To understand the specific park features that attract people to parks and increase their economic impact, we conducted a literature review to determine the most popular park amenities in the U.S. and other developed countries. Amenity use was evaluated based on the overall frequency of use as well as amenity use by demography. The review examined the use of several amenities in public, free parks to find which features attract the most people. The findings are sorted into four categories: amenity use based on gender, race, age, and most frequent amenity use regardless of demography.

The literature review showed that trails are the most important amenity to implement in parks; their presence has the strongest correlation to increasing park visitation when compared to other amenities (Shores & West, 2010). The literature review also found trends in amenity use by gender, race, and age. Males visit parks more often than females, participate more frequently in physical activity than females (Mota et al., 2017), and favor sports fields while females favor playgrounds (Loukaitou-Sideris & Sideris, 2009). Black and Asian children have been found to use basketball courts more than other amenities, Hispanic children have been found to use soccer fields more than other amenities, and White children have been found to use baseball diamonds more than other amenities (Loukaitou-Sideris & Sideris, 2009). Teenagers have low visitation rates to parks because they believe park amenities are boring, but are attracted to parks with amenities that provide a physical challenge (Veitch et al., 2017). Adult visitation often depends on park features available for their children (Loukaitou-Sideris & Sideris, 2009). Implementing popular amenities in parks helps create a more positive perception of parks, which leads to more monetary benefits from the park and to higher surrounding property values.

Safety

While safety is indirectly related to the economic benefits of parks, the perception of safety and ways to reduce crime was analyzed to determine if crime is an issue in County parks. News articles and park crime statistics were analyzed to determine how big an issue crime is in Montgomery County. Park policing reports and park plans were analyzed to determine the best methods to decrease crime in parks and increase the overall sense of safety so people will visit and support parks.

The literature review determined that there are aspects of physical design that can help reduce crime in parks, and that having a constant maintenance plan is crucial for minimizing crime (Hilborn, 2009). A park's physical design aspects—lighting, signage, sight lines, and visible exits—are important in ensuring safety as well as a sense of safety. Sufficient lighting helps people feel more secure since they can see what is around them, leading to more people visiting parks at all times of the day, even when it gets dark. Clear and understandable signage helps enhance the feeling of safety because people feel safer when they understand their location in a park. Clear sight lines help people see what is happening around them, removing concerns about hidden dangerous activity. Exits visible from all parts of the park make people feel they can easily escape when faced with dangerous behavior. Also, people are less likely to engage in illegal activity if they can't hide (Hilborn, 2009).

In terms of maintenance, people feel less safe in an unkempt and vandalism-ridden park. A decline in a park's condition also creates the opportunity for antisocial behavior to become prevalent since it illustrates to potential offenders that no one is trying to prevent these actions (Riley et al., 2017). Therefore, a maintenance plan that involves constant removal of vandalism and litter, ensuring that overgrown foliage does not result in hidden spaces, and regularly emptying trash and recycling bins can

increase the sense of safety people feel in a park and decrease crime. Also, making it known that there is surveillance, with signs that make the public aware of that surveillance, will make people less likely to litter or vandalize since they know there is a higher chance of getting caught. If open spaces are perceived as safe places, park visitation and monetary benefits will increase.

Current Public Perceptions

Understanding the current perceptions of parks and park development held by stakeholder groups was essential for developing effective surveys and recommendations for Montgomery County that will help garner support for park development. To gather the necessary data, a literature review of previous and current Maryland park proposals and development plans was conducted to evaluate the overall approval ratings of parks and park development by residents, property owners, and developers. It provided valuable insight into what stakeholder groups feel are positive and negative aspects of parks, and why. The research also helped identify the most effective survey types to promote the improvement and development of successfully used and maintained parks.

Survey results from the Democratic polling firm of Fairbank, Maslin, Maullin, Metz & Associates and from the Republican polling firm of Public Opinion Strategies showed overwhelming support by Maryland voters for Program Open Space, which helps fund the development of parks and open spaces as well as preserve and protect wildlife habitat and important natural areas (Everitt et al., 2016). These results showed positive support for the development of parks regardless of political affiliation, sex, ethnicity, age, or geographic location within the state. Public testimony from a 2017 hearing on the *Energized Public Spaces Functional Master Plan* by the Montgomery County Parks Department showed that a majority of residents support park development and feel that parks are important for communities and nature.

However, the literature review showed that businesses, developers, and homeowners have significantly more concerns about the potential negative consequences of park development including additional taxes and restrictions, and changes to zoning, development, and land use regulations. Finally, the literature review identified usership surveys as the most effective means for gauging public support for and participation in parks. Many of the Maryland park proposal plans reviewed used usership surveys that identified participation rates; preferred park amenities; and social, economic, and ethnic demographics of park users. Usership surveys have been identified as extremely effective in developing and managing successful parks, stating that “conducting surveys of park users can help managers respond better to community needs, resolve conflicts among groups of park users, and manage park assets more effectively...to maximize community benefits of parks” (Walker, 2004). Clearly, surveys are important to understand public opinion and to learn how public support for parks and the economic benefits of parks can be increased.

Primary Research Approach

Methods

A literature review provided information needed to inform residents about the benefits of parks and to inform the Department of Parks on ways to garner support for parks and open space proposals. Each team member addressed a research question to round out information about public opinions of parks, the economic benefits of parks, and concerns about living near parks. We assessed the impact of parks on businesses and property values, the economic value of ecosystem services, the economic impact of implementing certain amenities, the importance of safety, and current perceptions of parks.

This finalized review was used to create the survey to determine the current opinions about parks and their economic impact. The survey was addressed to developers, local property owners, local business owners, and park visitors, since each group has a different connection and perception of parks. We began with four separate surveys, one for each group, that included many written answers, but later switched to the survey website Qualtrics to make that data more concise and quantifiable. While creating these surveys, we wanted to discover the individual's connection to parks before asking their opinion, including whether or not they lived near a park and how often they visited parks.

Surveys were initially conducted in-person at Bethesda's Cabin John Regional Park, over two weekends. Due to time restraints and poor weather, we were unable to procure many survey responses from these trips, and so transitioned to Qualtrics. Qualtrics allowed us to send a link to the survey page to the recipient so that they could take the survey online and allowed us to better organize the survey data. To gain more resident and park visitor responses, each team member individually emailed their contacts who lived in the area; we received a good number of responses. Rick Liu of the Montgomery County Planning Department provided a list of developer contacts and we used a separate list from our research. We then both called and emailed each developer, but had fewer responses than hoped. Unfortunately, we only received two business responses, and so the results and recommendations section has little business data. All responses were anonymous.

Finally, the team compared findings from individual research topics with the survey results to determine if public perceptions, interests, or demographics were significantly different from our background research findings; this helped to ensure that the team could provide the County with up-to-date recommendations.

Resident Survey

In an online survey, Montgomery County residents were asked their ethnicity, gender, age, and number of children. They were also asked if they were homeowners and the number of times they visit County parks. Respondents were also asked whether they considered nearby parks when buying their homes, the park's impact on their property value, the value of paying more to live near a park, concerns about living near a park, and the attractiveness of certain amenities. We also received a few surveys from our in-person trips (see Appendix charts a-d, e-k).

Developer Survey

In an online survey, 30 developers with properties in Montgomery County were asked their opinions about paying more to develop near a park, the importance of a park when developing, concerns about developing near a park, challenges when developing near a park, and the advantages and disadvantages of developing near a park (see Appendix charts a-d, l-n).

Business Survey

In an online survey, businesses adjacent to parks in Montgomery County were asked their opinions about the cost of conducting business near a park, the effect of the park on their business, the effect of the park on their customers, changes in business due to the park, concerns about conducting business near a park. Unfortunately, we only received two responses (see Appendix charts a-d, l-n).

Survey Analysis

Demographics

Of the more than 50 overall responses, the majority were residents and park visitors (see Appendix chart a). More women responded than men, and most of the residents surveyed were homeowners (see Appendix chart a). Additionally, for most homeowner responses, the nearest park to their home already existed when they bought the house (see Appendix chart f). Most of them also responded that they had been to a County park in the last month, and that they visited this park more than once a month (see Appendix charts c and g).

However, due to a smaller than anticipated sample size, we do have sample errors and less than ideal diversity. All responses were from adults aged 19 and older, which is important to note when looking at amenities results. Additionally, most responses were from Caucasian people; we had low Hispanic and Asian representation and no African American representation, even though there are large populations in Montgomery County (see Appendix chart a). Finally, it's important to note that although the majority of residents said they visited parks at least once a month, responses were fairly evenly spread from "frequently visits parks" to "never visits parks," meaning that a significant portion of the individuals surveyed hardly to never visit Montgomery County Parks (see Appendix chart g). These demographic differences may or may not have a large impact on the results, but could contribute to sample error.

Amenities

Trends in amenity preference were evident in the resident surveys. Respondents were asked to rank the following amenities as "very attractive," "moderately attractive," "a little attractive," or "not attractive at all": baseball/softball diamonds, basketball courts, gym equipment/exercise stations, paved trails, playgrounds, skate parks, sports fields, tennis courts, and unpaved trails. The amenities were then given a score from 1 to 4 based on the total number of times they were deemed "very attractive,"

“moderately attractive,” “a little attractive,” or “not attractive at all.” Amenities ranked as “very attractive,” received a score of 4. Amenities ranked “moderately attractive,” received a score of 3. Amenities ranked “a little attractive,” received a score of 2, and amenities ranked “not attractive at all,” received a score of 1. The average attractiveness score of each amenity was then calculated (see Table 1). Differences in attractiveness scores for each amenity were found using a t-test through Microsoft Excel.

Paved trails are the most popular amenity (see Figure 1), while skate parks are the least attractive (see Figure 2). The t-test showed that paved trails were significantly more popular than any other amenities. The second most attractive amenities were playgrounds, unpaved trails, sports fields, and tennis courts, which were statistically equivalent. The third most popular amenities were gym equipment, basketball courts, and baseball diamonds, which were all statistically equivalent. The t-test also showed that skate parks were significantly less attractive than any other amenity. However, it is once again important to note that we received no responses from residents younger than age 19. If teenagers had been included in our sample, it could be possible that skate parks would be more popular.

The literature review indicated that Caucasian people have a strong preference for baseball diamonds. However, even though our data consisted mostly of responses from Caucasian residents, baseball diamonds were the second most unpopular amenity. Additionally, dog parks are not listed as an amenity in the responses. However, in additional comments from two dog-owning residents who took the survey, dog parks were their top amenity; one was willing to drive ten or more minutes every day to a park that included a dog park. Both dog-owners also mentioned that it was a necessity to them that a new home had a park directly adjacent to them for them to walk their dog every day.

Table 1. Popularity of Park Amenities. Survey respondents in Montgomery County, Maryland were asked to rank baseball diamonds, basketball courts, gym equipment, paved trails, playgrounds, skate parks, sports fields, tennis courts, and unpaved trails as “very attractive,” “moderately attractive,” “a little attractive,” or “not attractive at all.” Rankings of “very attractive” received a score of 4, rankings of “moderately attractive” received a score of 3, rankings of “a little attractive” received a score of 2, and rankings of “not attractive at all” received a score of 1. The scores of each amenity were then averaged to find the final mean attractiveness score. Based on the attractiveness scores of each amenity, the following is a list of the amenities ordered from highest score to lowest score: paved trails, playgrounds, unpaved trails, sports fields, tennis courts, gym equipment, basketball courts, baseball diamonds, and skate parks.

Amenity	Number of Times Ranked "Very Attractive" with a Score of 4	Number of Times Ranked "Moderately Attractive" with a Score of 3	Number of Times Ranked "A Little Attractive" with a Score of 2	Number of Times Ranked "Not Attractive At All" with a Score of 1	Attractiveness Score
Baseball Diamonds	2	12	10	10	2.18
Basketball Courts	7	10	10	7	2.47
Gym Equipment	10	8	8	8	2.59
Paved Trails	21	9	5	0	3.46
Playgrounds	16	8	6	5	3
Skate Park	1	8	7	18	1.76
Sports Fields	10	13	5	5	2.84
Tennis Court	11	11	3	8	2.76
Unpaved Trails	12	9	9	3	2.91

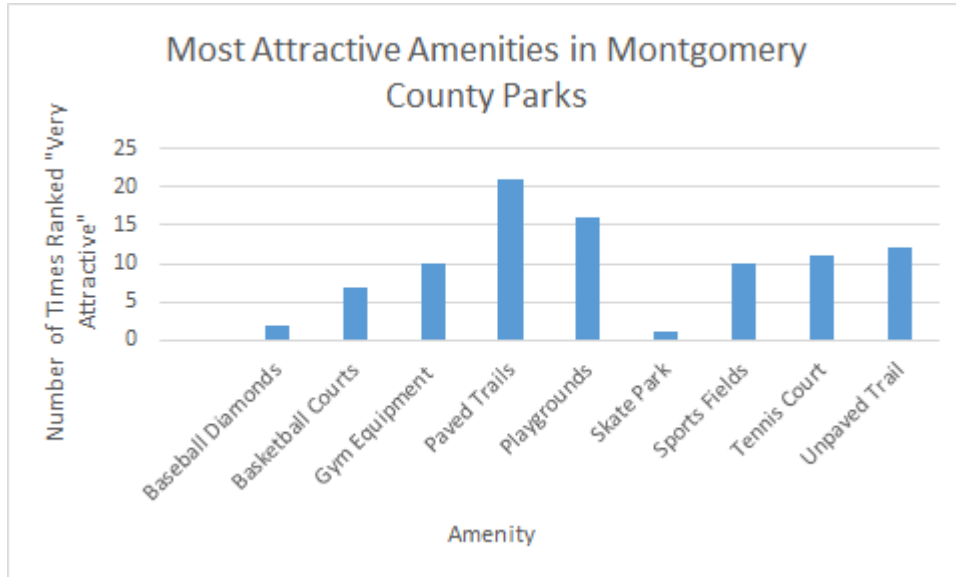


Figure 1: Survey Respondents' Favorite Park Amenities. The graph shows that paved trails received the most rankings as "very attractive." Paved trails are the most attractive amenity to Montgomery County residents and visitors.

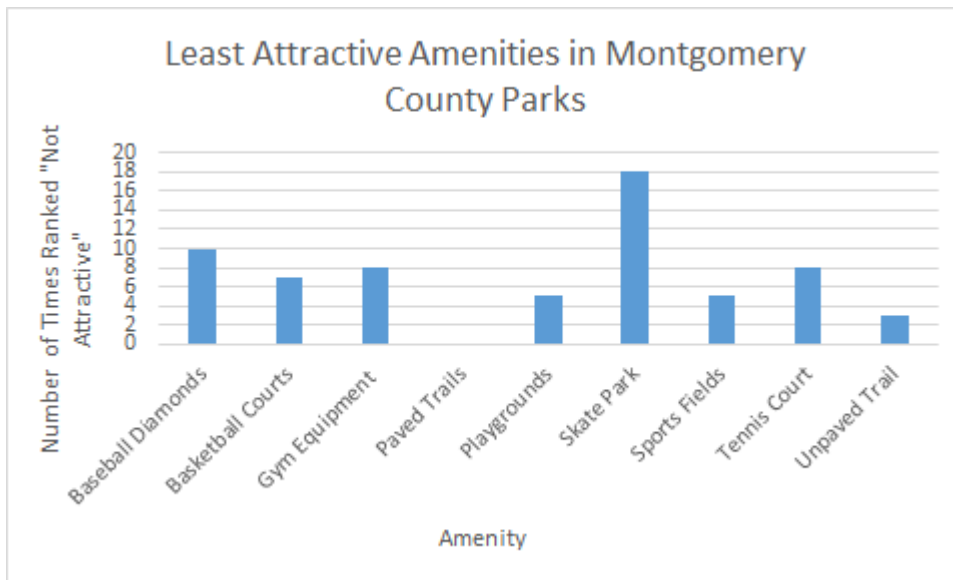


Figure 2: Survey Respondents' Least Favorite Amenities. This graph shows that the skate parks received the most rankings as "not attractive at all." Skate parks are the most unpopular amenity in Montgomery County.

Resident Opinions

Of the 37 Montgomery County residents who responded to the survey, 68% were homeowners (Figure 3), while 59% of the remaining respondents plan to purchase a home within the next five years (Figure 4). About 50% of homeowner respondents have owned their home for more than 20 years, while 74% stated that there was already a park established nearby when they initially purchased their home. Half of the homeowners surveyed responded that they considered the nearby park as a factor when deciding to live where they currently do, and 65% of homeowners visit these parks at least once a month or more (Figure 5).

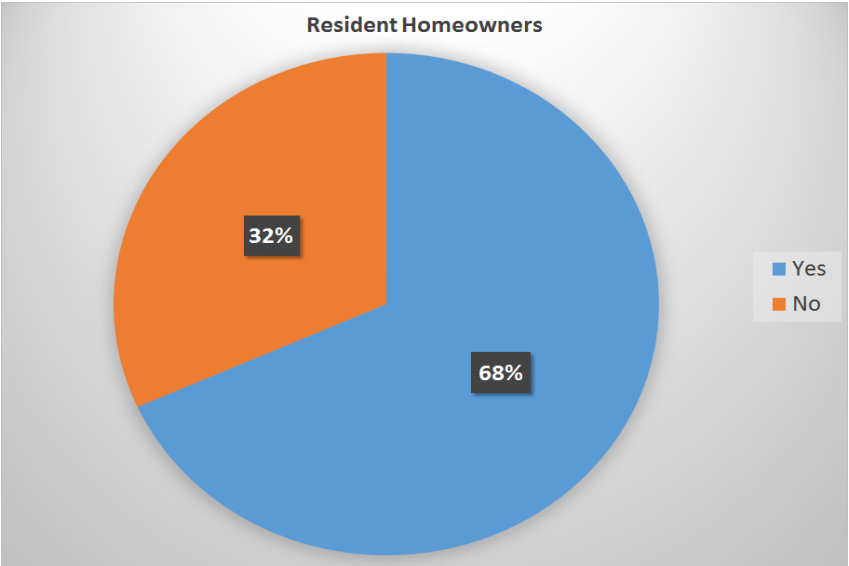


Figure 3: Percentage of Surveyed Residents who are Homeowners. Out of 37 respondents, about 68% of the residents we surveyed own their home compared to 32% who are just renting.

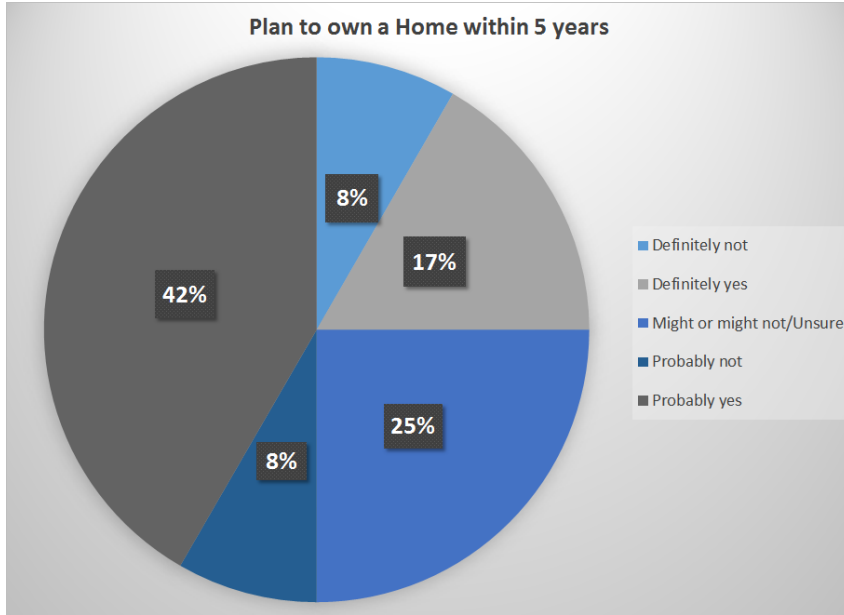


Figure 4: Percentage of Residents who Plan to be Homeowners within the Next Five Years. Out of 37 respondents, a large majority said they will still be living in the same place, while a quarter were not sure. The rest of the respondents said they will not or will probably not be living in the same place in the next five years.

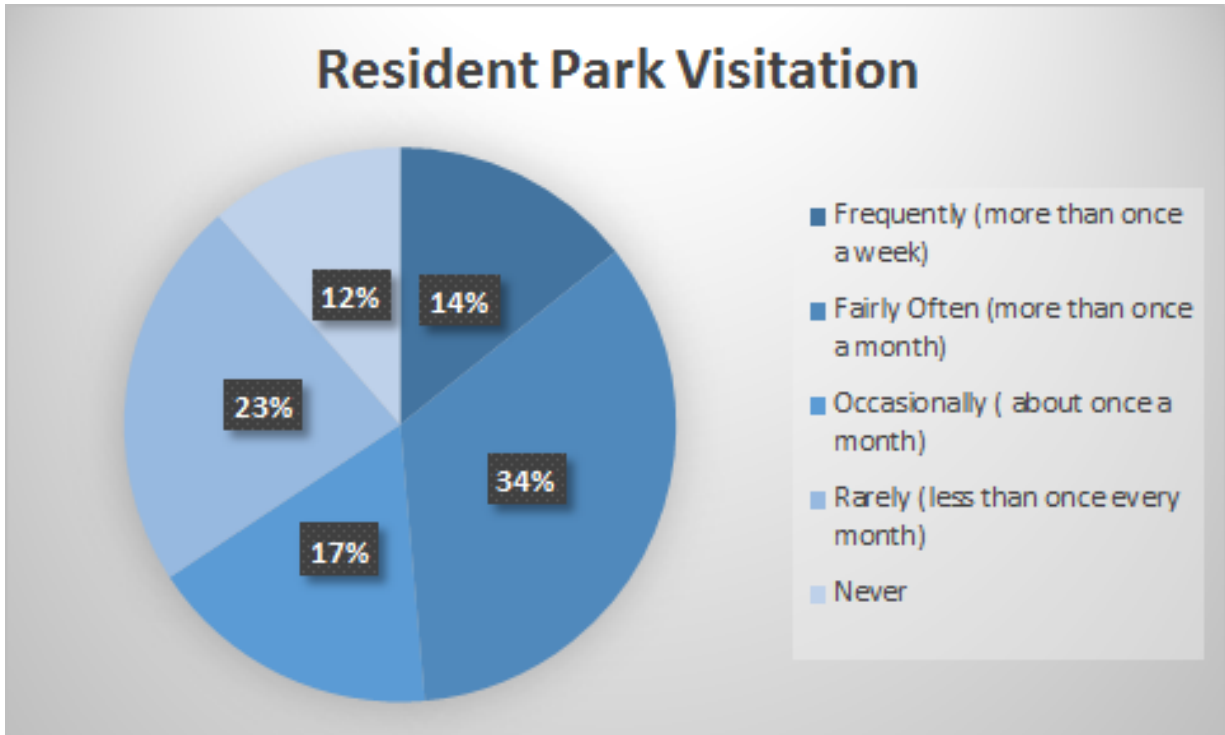


Figure 5: Park Visitation Rates. About 1/3 of the respondents said they visit a park fairly often, or more than once a month, and only 14% said they visit a park more than once a week. 17% of respondents said they visit a park about once a month, and about 1/3 of the respondents said they either rarely or never visit parks.

When residents were asked how they felt parks affected their property value when they first moved in, about 85% of the residents believed the park had a slightly or very positive effect and about 15% said they believed there was little to no effect; no respondents thought the park had a negative effect on their property value. Similar results were obtained for how residents think nearby parks affect their property's value today (Figure 6). When asked whether they think it is worth it to pay slightly more to live near a park in Montgomery County, 39% of residents said yes, about 50% said probably so, and only 8% said probably not and 3% said definitely not.

Finally, while a vast majority of residents responded they had no concerns about living near parks, 23% of resident respondents expressed concerns such as night time park safety and unauthorized activities, additional traffic caused from park visitors from outside the area, as well as the potential for homeless people staying in the park, nuisance wildlife, and improperly discarded trash left by park goers (Figure 7).

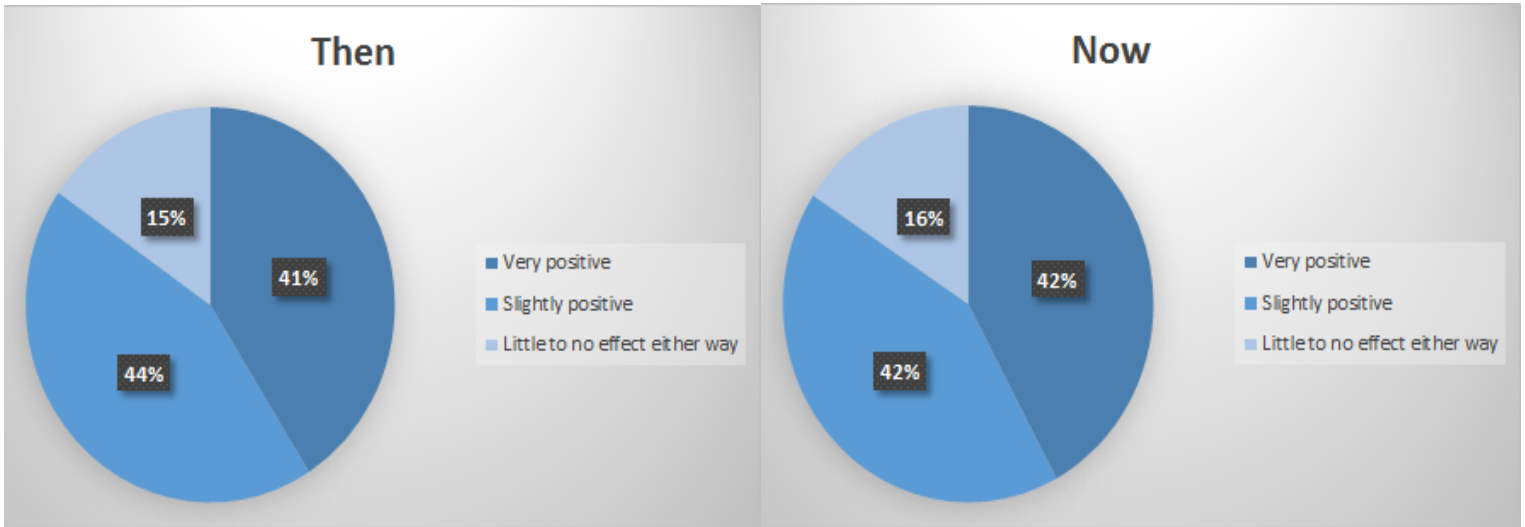


Figure 6: Impact of Parks on Property Values. These two pie charts show how survey respondents believe their property has been impacted by being adjacent to a park, both back when they first purchased the house and now. There is almost no change between how residents feel their property has been impacted back then and now. For both times, around 85% of people thought parks have a positive effect on their property value and only 15% said no effect. No one said parks have a negative impact on property value.

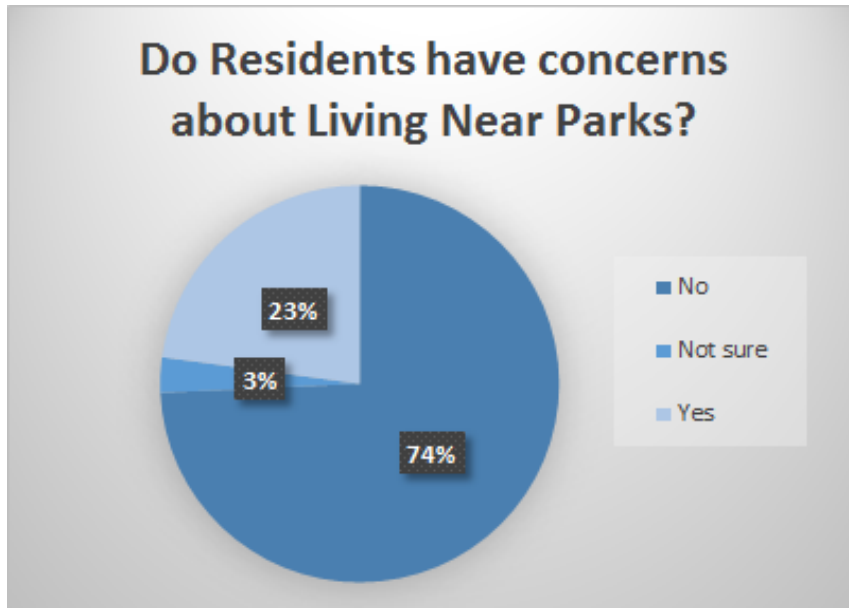


Figure 7: Percentage of Residents who Have Concerns about Living near Parks. Out of the 37 respondents, about 74% of respondents said they do not have concerns about living next to parks, while 23% said they do have concerns and only 3% were unsure. This shows that overall, Montgomery County residents are not very concerned about living near a park.

Developer and Business Responses

While we did not have a large number of developer responses, we did gather some valuable information from them. Developer opinions on the effects of parks on property values has not changed significantly over time. About 87% felt that parks have a positive impact on property values when they initially acquired their property, and 86% still feel this way today. All the developers surveyed believed that businesses are positively affected by nearby parks, and 75% felt it was worth it to pay slightly more to develop near a park in Montgomery County (Figure 8).

However, 38% of developers surveyed expressed concerns about developing near a park (Figure 9). Concerns included park maintenance and hours of operation as well as questions about who would maintain control of the park once its established and whether or not developers would have any say in park operations. Other concerns included the potential for increased criminal activity, and the environmental implications of developing near parks, including the adaptation of alternative or low impact, eco-friendly design methods, and additional requirements and costs for developments near parks.

All business owners surveyed stated that they thought it was worth it to pay slightly more to maintain a business near a park in Montgomery County, and a majority of them thought that urban parks had a slightly positive effect on nearby businesses.



Figure 8: Developers’ Willingness to Pay to Develop next to a Park. Out of 9 respondents, only 25% of developers said they are definitely willing to pay more to develop next to a park, while 50% said they probably would pay more and 25% said they would probably not pay more. This shows that while developers are not too concerned about parks, they would not go very out of their way to develop next to a park.

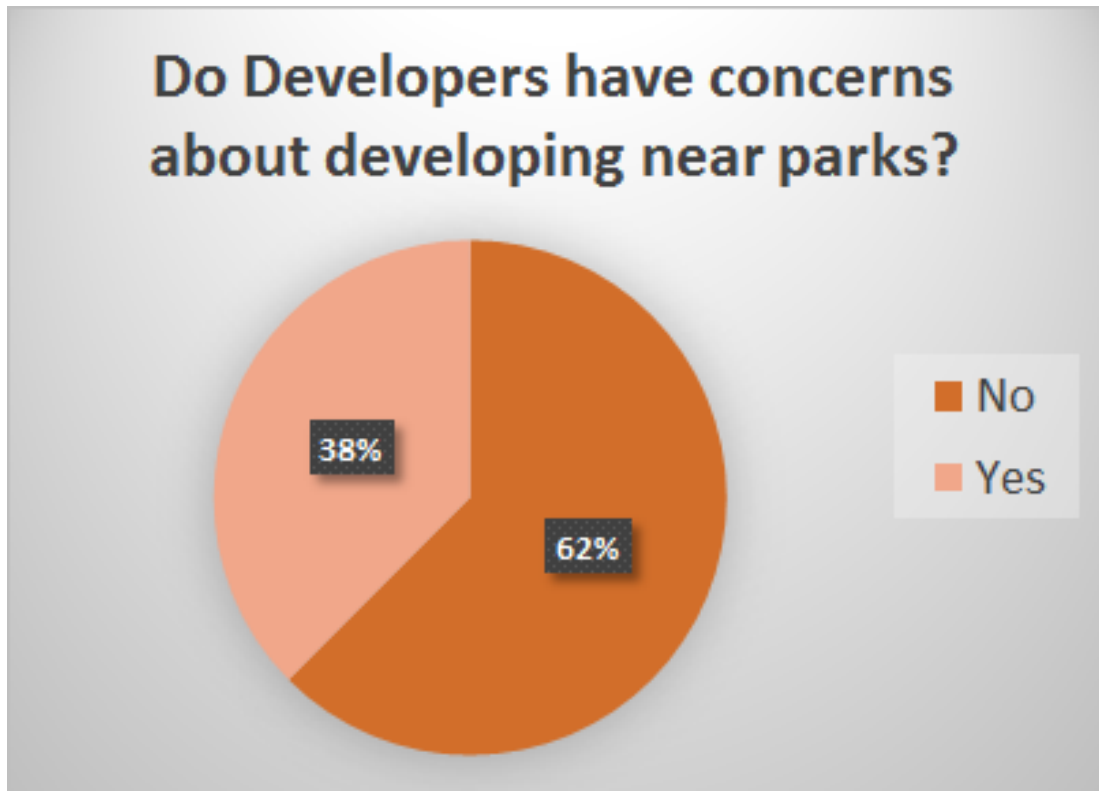


Figure 9: Percentage of developers who have concerns about developing near parks. Out of 9 respondents, about $\frac{2}{3}$ of developers said they do not have concerns about developing next to parks while about $\frac{1}{3}$ do have concerns. This shows that while a majority of developers do not see parks as in issue in development, there are still a number who do.

Successful Parks

Finally, survey respondents were asked to identify key factors they felt made a park successful. Responses included education and involving the public in park planning processes, as well as decision making and implementation. They also felt that successful parks must be well maintained and accessible for everyone, that they must provide ample and convenient parking and popular amenities, and be well integrated into the surrounding communities.

Final Recommendations

Analyzing the results of literature review and surveys led to the following recommendations to help the Montgomery County Department of Parks create parks that will provide the highest economic and social benefits to residents and visitors.

Implement Popular Amenities

Montgomery County can significantly increase support for parks by adding and advertising amenities that are most popular with the local public. Popular amenities are shown to attract more people and lead to the perception that the entire park is attractive, which can in turn increase its economic benefit. Popular amenities can help increase the value of parks, thereby increasing the property values of lands near the parks. Developing parks with attractive amenities is crucial to maintaining parks' positive economic impacts.

1. Paved Trails

Because amenities increase park visitation, we recommend that Department of Parks implements as many desired parks amenities that the County can afford. The literature review suggested that paved trails are the amenity that attracts the most people to parks, and our survey confirmed that County residents find paved trails to be the most attractive amenity. The survey analysis found a significant difference in the perception of paved trails compared with any other amenity and a t-test confirmed that significantly more people find paved trails to be the most attractive park feature.

Paved trails have such a high value of attractiveness because they provide comfortable walking and running space that is accessible to foot traffic, dogs, bicycles, strollers, and any other wheeled item. Paved trails are safer for users since there is no uneven ground or obstacles that could cause an accident. Paved trails also allow for easier access on wet grounds because visitors do not have to worry about slipping or getting muddy. Trails increase visitation more than any other amenity, so every public park should have at least one paved trail, providing people the opportunity to exercise, walk through nature, and gather with others.

2. Family-Oriented Activities

Both the literature review and the survey indicated that families visit parks at significantly high rates. Families are more likely to visit parks than other people because parents enjoy bringing their children to parks for entertainment in nature. Therefore, programs and amenities that attract entire families are encouraged. Playgrounds, sports fields, unpaved trails, and tennis courts were found to be the second most popular amenities in Montgomery County based on the analysis of the survey results. Playgrounds and sports fields received such high ratings of attractiveness by adults because these features provide their children the opportunity to play and exercise. When amenities are available for children, parents are more likely to value this amenity and bring their child to the park.

Because families have such high rates of park visitation, family-friendly programs are also encouraged. Programs can include arts and crafts, farmer's markets, fitness events, game nights, live music, movie screenings, picnics, and sports teams. These programs will increase the likelihood that at least one person in a family will be interested in an event at the park, resulting in the entire family visiting. These programs allow neighbors to meet, gather, and build friendships centered around nature. and they can also incorporate education describing the importance of parks and how they benefit both the ecosystem and the economy.

3. Dog Parks

Though not mentioned in the literature review, our survey with Montgomery County residents found that park visitors tend to be dog owners. The survey results indicated that close proximity to a park was imperative for dog owners when buying a house so that they have a place to walk their pets. Other survey respondents indicated that they would travel over ten minutes to visit dog parks. Dog parks were very important to those who owned dogs, so we believe that it would, at least, be beneficial to include small dog-friendly amenities--if not a dog park--including dog bags among other features. These features can encourage and support the continued use of these parks by dog owners.

Create Educational Programs

The Department of Parks already offers an impressive amount of educational programs including those implemented through social media; recommendations here are suggestions to help their programs continue and expand. Montgomery County could consider creating and expanding current educational programs to inform the public about the importance of ecosystem services that park spaces can provide. Based on observations and research, many people don't know what ecosystem services are or what they provide. Also, many don't know that these services create economic benefits for surrounding development. This information can be provided in many simple ways. Informational pamphlets describing the ecosystem services present in a park are a cheap and effective way of educating the public. Another option would be signs that point out services provided by the environment and how those services benefit the visitors and surrounding region.

A more in-depth way to educate the public would be an interactive presentation that can be held in park nature centers or at meetings with developers who are hesitant to participate in developing a nearby park. These presentations can vary in detail and topics according to the audience. Younger audiences will focus on what ecosystem services are and why it's important to have green spaces. Presentations to businesses and developers should include this project's data as concrete evidence that ecosystem services provide health and economic benefits.

Educational programs should also focus on the importance of ecosystem services provided by parks to the economy and parks' positive impact on property values. Some residents may be unaware of these impacts; informing them could encourage more public support for open spaces. Residents can be informed through flyers in County parks. An email to County residents would also inform them of parks' importance. Park signage describing the ecosystem services could highlight economic benefits. Even in small open spaces between buildings these signs would be helpful, as people tend to walk through these open spaces often.

While the Department of Parks already uses various forms of social media, it can create social media updates of information regarding the value of ecosystem services. For example, The Department could post an Instagram picture of trees in a specific park and explain the dollar value that a tree returns to the community through the ecosystem services that it provides.

Develop an Atmosphere of Safety

Multiple survey respondents mentioned they consider safety when deciding whether to live next to a park. While Montgomery County is generally a safe place compared to other areas in the U.S., safety should still be a significant concern for the Parks Department when creating and managing a park. An atmosphere of safety can be encouraged by publicizing the precautions taken by the Department of Parks and the Park Police. For example, it should be well known that Park Police patrol the areas, and that there is a Park Watch Program. Security features like this can be advertised using signs so that residents know they are actively protected during their visit. For example, park signs can note security cameras, that there is sufficient lighting in the park, that the park is under constant maintenance to stop people from doing illegal actions, and other safety measures.

Direct measures can also decrease crime such as adding lighting to dim places, adding cameras to areas of concern, and maintaining the vegetation to minimize the amount of hiding spaces. Finally, installing Code Blue Emergency Poles throughout the parks can make people feel like there is always a way to call for help in an uncomfortable situation.

More people will visit parks that feel safe. Safe parks are more attractive to residents; people will not want to live near an unsafe park. If people are aware of how the Department of Parks and the Park Police keep the parks secure, than safety will be less of a concern for residents and developers when they are considering whether to live or develop next to a park.

Conduct Future Surveys

Finally, the County could consider using this project's surveys to guide future park proposals, as well as to improve and maintain current parks. By analyzing survey results, the County would be able to gauge public opinion and tailor parks to residents and visitors as demographics change.

This project's time constraints made it difficult to gather a wide variety of survey respondents. Most who responded were middle-aged, Caucasian people. By conducting a similar survey, Montgomery County would be able to better understand the perceptions of other ethnicities and age groups, and be able to maintain parks to benefit the most people. Surveys would also allow Montgomery County to create a database of perceptions of residents, developers, and business owners that could be examined over time to uncover trends in public opinion.

We also recommend that surveys be conducted in different seasons to determine differences in park visitation and how to increase visitation during different times of the year. A continued survey effort would also help the County discover why some parks are successful and others are not. By discovering how trends are shifting or preferences in differ in certain areas of the County, the Department of Parks can develop open spaces that will attract the most people and have the greatest economic impact.

Conclusion

We've seen that the implementation and maintenance of parks is important to Montgomery County residents and developers, as well as to the local economy. Through research and subsequent

surveys, we've found that parks and open spaces generally have a positive economic impact and provide social, environmental, and economic benefits.

These results will enable Montgomery County to make the best parks possible to increase park visitation and public support for parks. We believe that the recommendations can also lead to a more positive perception of parks, which can increase local property values and the economic benefits that parks provide.

Appendix

All Surveys

a)

		Age					Ethnicity								Gender					Total		
		0-18	19-36	37-54	55+	Total	Black/African American (non-Hispanic)	Native American	Hispanic	Asian/Pacific Islander	Middle Eastern or North African	Caucasian (non-Hispanic)	Biracial/Multiracial	Other	Prefer Not to Say	Total	Male	Female	Transgender		Other	Prefer Not to Say
I am a...	Resident	0	15	7	14	36	0	0	4	2	0	32	0	0	0	36	11	24	1	0	0	36
	Developer	0	2	3	2	7	0	0	1	0	0	5	0	0	1	7	5	3	0	0	0	8
	Business Owner	0	0	1	0	1	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	1
	Total	0	17	11	16	44	0	0	6	2	0	37	0	0	1	44	17	27	1	0	0	45

b)

		Do you have children?				Are you a homeowner?		Do you plan on owning a home in the next 5 years?					Total		
		Yes, aged 12 or younger	Yes, aged 13-18	Yes, aged 19 or older	I do not have children	Total	Yes	No	Total	Definitely yes	Probably yes	Might or might not/Unsure		Probably not	Definitely not
I am a...	Resident	5	4	11	14	34	24	12	36	2	5	3	1	1	12
	Developer	0	0	0	0	0	5	3	8	0	0	0	0	0	0
	Business Owner	0	0	0	0	0	1	0	1	0	0	0	0	0	0
	Total	5	4	11	14	34	30	15	45	2	5	3	1	1	12

c)

		Have you been to a public park in Montgomery County in the past month?			Total
		Yes	No	Not Sure	
I am a...	Resident	21	12	3	36
	Developer	5	3	0	8
	Business Owner	1	0	0	1
	Total	27	15	3	45

d)

		When did you move in to your current property in Montgomery County?					Total
		2011-2017	2001-2010	1991-2000	1981-1990	1980 or earlier	
I am a...	Resident	9	7	11	2	2	31
	Developer	0	0	0	0	0	0
	Business Owner	0	0	1	0	0	1
	Total	9	7	12	2	2	32

Resident Responses

e)

		Did you consider a nearby park as a factor when deciding to live where you currently do?			Total
		Yes	No	Can't remember/Unsure	
I am a...	Resident	18	11	7	36
	Developer	0	0	0	0
	Business Owner	0	0	0	0
	Total	18	11	7	36

f)

		Was the park nearest to your home already there when you moved in?			Total
		Yes	No	Unsure	
I am a...	Resident	26	4	5	35
	Developer	0	0	0	0
	Business Owner	0	0	0	0
	Total	26	4	5	35

g)

		How often do you visit this park each month (in reasonable weather)?					Total
		Frequently (more than once a week)	Fairly Often (more than once a month)	Occasionally (about once a month)	Rarely (less than once every month)	Never	
I am a...	Resident	5	12	6	8	4	35
	Developer	0	0	0	0	0	0
	Business Owner	0	0	0	0	0	0
	Total	5	12	6	8	4	35

h)

		What did you think park's effect on your property's value was when you acquired it/moved in?					Total
		Very positive	Slightly positive	Little to no effect either way	Slightly negative	Very negative	
I am a...	Resident	15	15	6	0	0	36
	Developer	3	5	0	0	0	8
	Business Owner	0	1	0	0	0	1
	Total	18	21	6	0	0	45

i)

		What do you think the park's effect on your property's value is today?					Total
		Very positive	Slightly positive	Little to no effect either way	Slightly negative	Very negative	
I am a...	Resident	15	14	6	0	0	35
	Developer	3	5	0	0	0	8
	Business Owner	0	1	0	0	0	1
	Total	18	20	6	0	0	44

j)

Do you think it is worth it to pay slightly more to live near a park in Montgomery County?	Resident	
	Yes	15
	Probably so	17
	Probably not	3
	Definitely not	1
Total	36	

k)

		Do you have any concerns about living near a park? If so, what?			Total
		No	Yes	Not sure	
I am a...	Resident	26	8	1	35
	Developer	0	0	0	0
	Business Owner	0	0	0	0
	Total	26	8	1	35

Developer and Business Responses

l)

		Do you think it is worth it to pay slightly more to develop near a park in Montgomery County? (As...				Total
		Yes	Probably so	Probably not	Definitely not	
I am a...	Resident	0	0	0	0	0
	Developer	2	4	2	0	8
	Business Owner	0	0	0	0	0
	Total	2	4	2	0	8

		Do you have any concerns about developing near a park? If so, what?			Total
		No	Yes	Not sure	
I am a...	Resident	0	0	0	0
	Developer	5	3	0	8
	Business Owner	0	0	0	0
	Total	5	3	0	8

m)

n)

		I am a...			Total
		Resident	Developer	Business Owner	
Do you think it is worth it to pay slightly more to maintain a business near a park in Montgomery...	Yes	0	0	0	0
	Probably so	0	0	2	2
	Probably not	0	0	0	0
	Definitely not	0	0	0	0
	Total	0	0	2	2
What effect do you think urban parks have on nearby businesses?	Very positive	0	3	0	3
	Slightly positive	0	5	1	6
	Little to no effect either way	0	0	0	0
	Slightly negative	0	0	0	0
	Very negative	0	0	0	0
Total	0	8	1	9	
Have you noticed a change in business since the park opened?	Yes, it's been very positive	0	0	0	0
	Yes, it's been slightly positive	0	0	0	0
	I've noticed little to no effect on my business	0	0	0	0
	Yes, it's been slightly negative	0	0	0	0
	Yes, it's been very negative	0	0	0	0
Total	0	0	0	0	
Do you have any concerns about operating a business near a park? If so, what?	No	0	0	2	2
	Yes	0	0	0	0
	Not sure	0	0	0	0
Total	0	0	2	2	

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