

## McMillan 2012 Survey Report

### Background of McMillan Park

- In the early of 1900s, Frederick Law Olmsted Jr. & Olmsted Firm designed McMillan Park Landscape, which include the Sand Filtration Site & Reservoir across 1<sup>st</sup> Street. Frederick Law Olmsted Jr. was a great American Landscape Architect who commits his lifetime to national parks, like Yosemite National Park, Rock Creek Park, and White House Grounds.
- 1905, the completion of the McMillan Reservoir Sand Filtration Site was a Washington public health milestone. Its innovative system of water purification, which relied on sand rather, led to the reduction of many communicable diseases in the city.
- In March 1911, President Taft & Congress officially designated the site as a park. In 1991, the D.C. Historic Preservation Review Board designated the site a Historic Landmark and nominated the site for the National Register of Historic Places.
- In 1987, the District of Columbia Government purchased the site from the federal government in 1987 for \$9.3 million dollars, in order to facilitate development. Since the time of purchase, the property has been vacant and has deteriorated severely due to lack of maintenance. The Underground cells have ceiling heights of approximately 12 feet.
- The survey was the first ever data-collection effort undertaken during the past twenty-plus years of McMillan Park development proposals, approved by McMillan Advisory in conducting the door-to-door McMillan Community Survey of 2012.

### Data Collection and Cleaning

The McMillan Park Community Survey evaluated a broad range of concerns related to the proposed development plans. The survey team collected data from approximately 1,010 individual respondents. For surveying, the data collectors carried and collected hard-copy forms to/ from random survey takers' occupancy in person.

Questionnaires with incomplete contact information (such as missing address, email or phone number) are removed in the data cleaning process to make sure all respondents can be traced back.

There are 983 valid respondents in the analysis. They are mainly from Bloomingdale and Stronghold communities and other parts of DC.

**Xi Meng**

George Washington University  
Final Version 1

**Table 1. Residents Distribution**

<i>Neighborhood</i>	<i>Counts</i>	<i>Percentage</i>
Bloomingdale	348	35%
Stronghold	176	18%
Others	459	47%
Total	983	100%

**Table 2. Wards Distribution**

<i>Ward Live In</i>	<i>Counts</i>	<i>Percentage</i>
Ward 1	69	7.1%
Ward 2 & 3	16	1.6%
Ward 4	16	1.6%
Ward 5	690	70.2%
Others	192	19.5%
Total	983	100%

The Residents Distribution Table (Table 1) indicates that Bloomingdale and Stronghold are the two major communities in the McMillan Park survey. They make up more than 50% of surveyed population alone with others from across DC. Table2. Wards Distribution shows that, 70% of surveyed population lives in Ward 5, where McMillan Park is located. So, this survey analysis mainly focuses on Ward 5, especially in Bloomingdale and Stronghold neighborhoods.

## Survey Results

### 1. Response Demographic

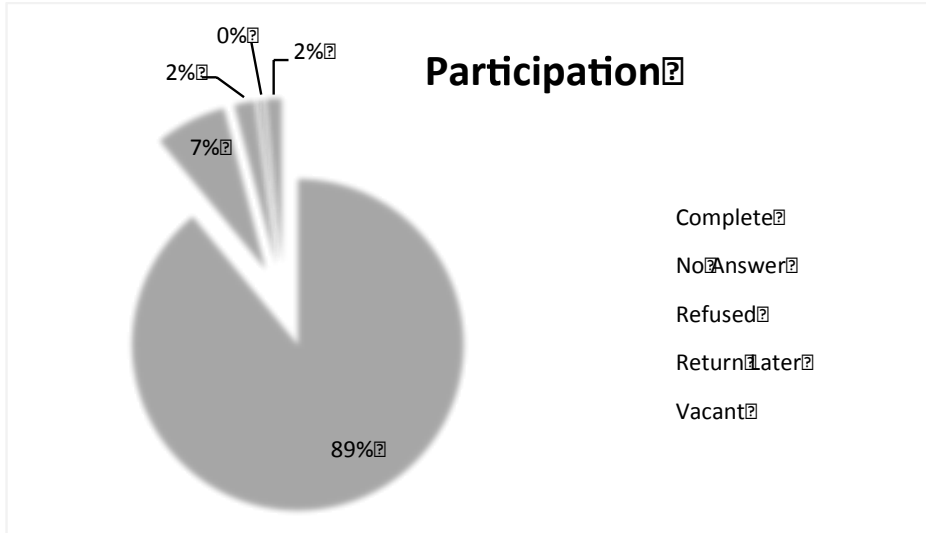


Figure 1. Participation Rate in McMillan Park Survey

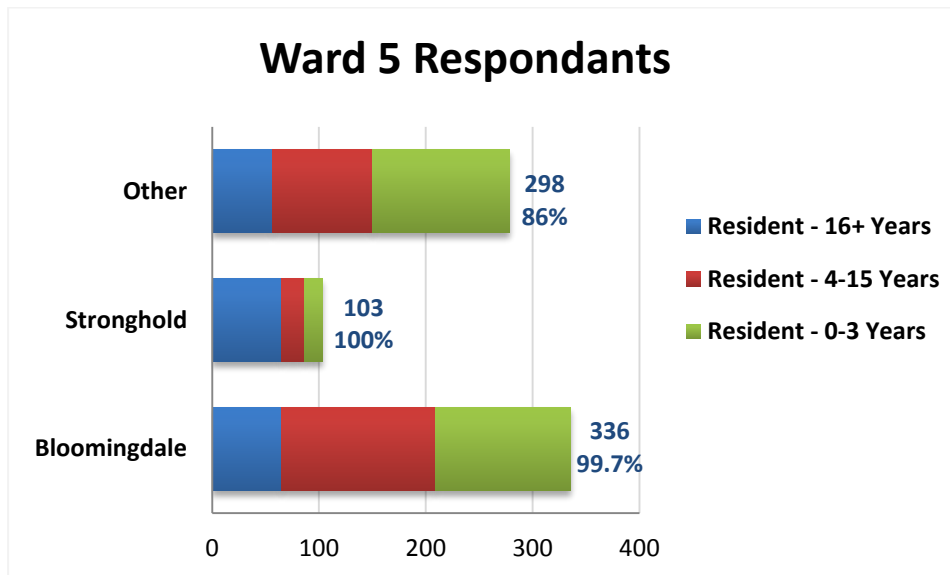


Figure 2. Ward 5 Respondents and Participation Rate (Percentage) in McMillan Park Survey

### 2. Residents Desire for %Development / %Park Space

Xi Meng

George Washington University

Final Version 1

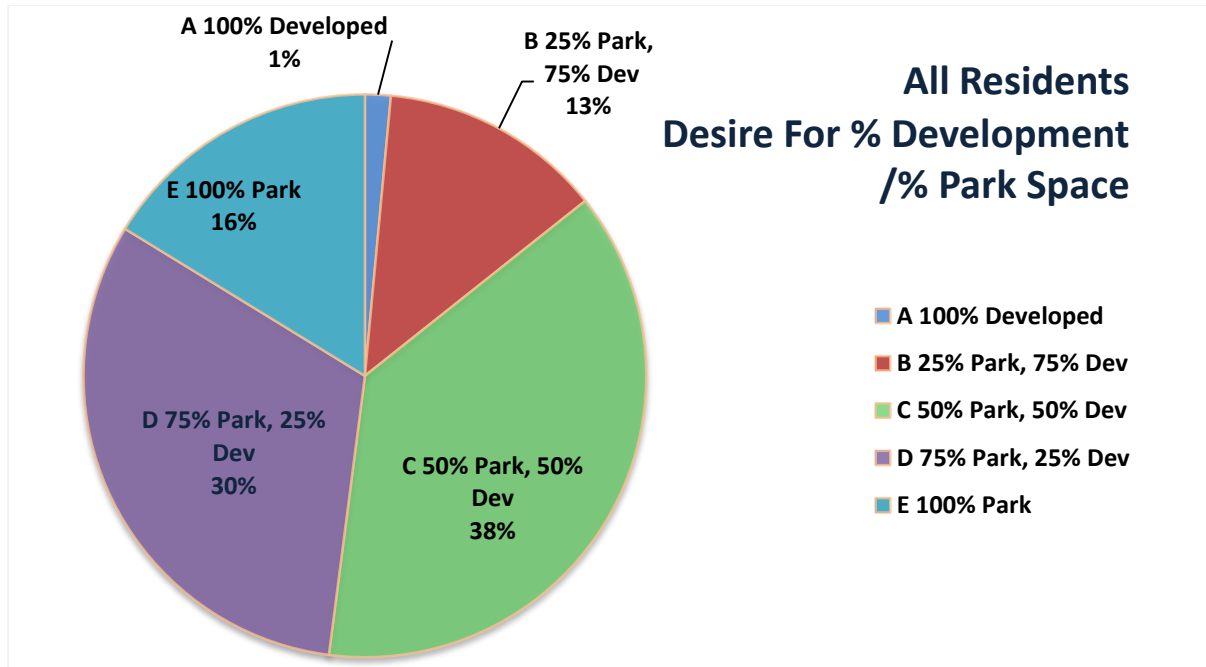


Figure 3. All Residents Desire for Dev./Park in McMillan Park Survey

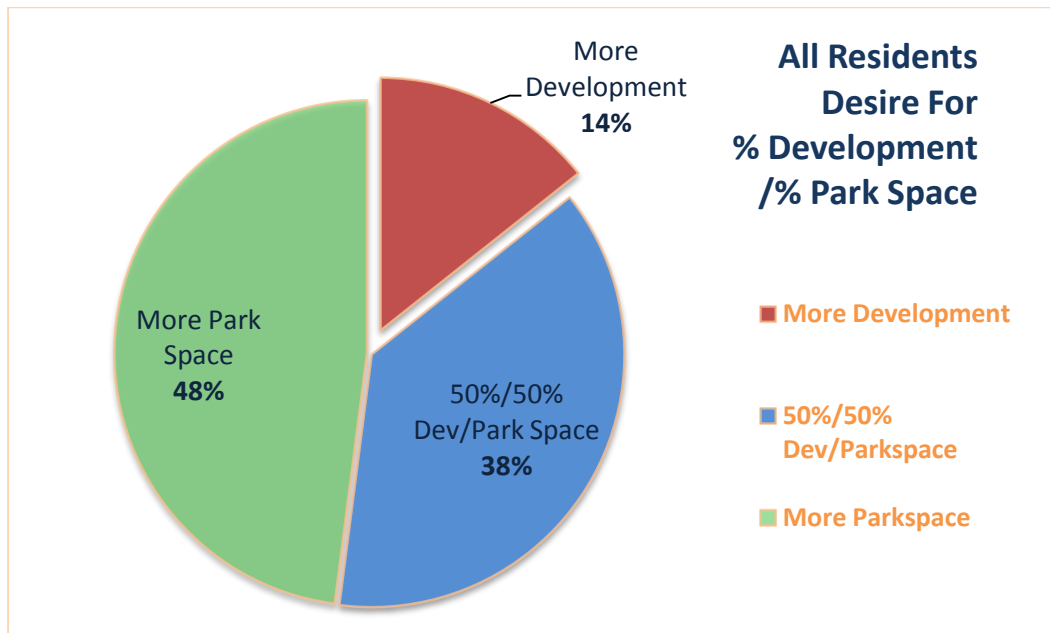


Figure 4. All Residents Desire for More Dev./ Park in McMillan Park Survey

We can see that there are about **86%** residents in our survey willing to have at least 50% Park Space in McMillan Park.

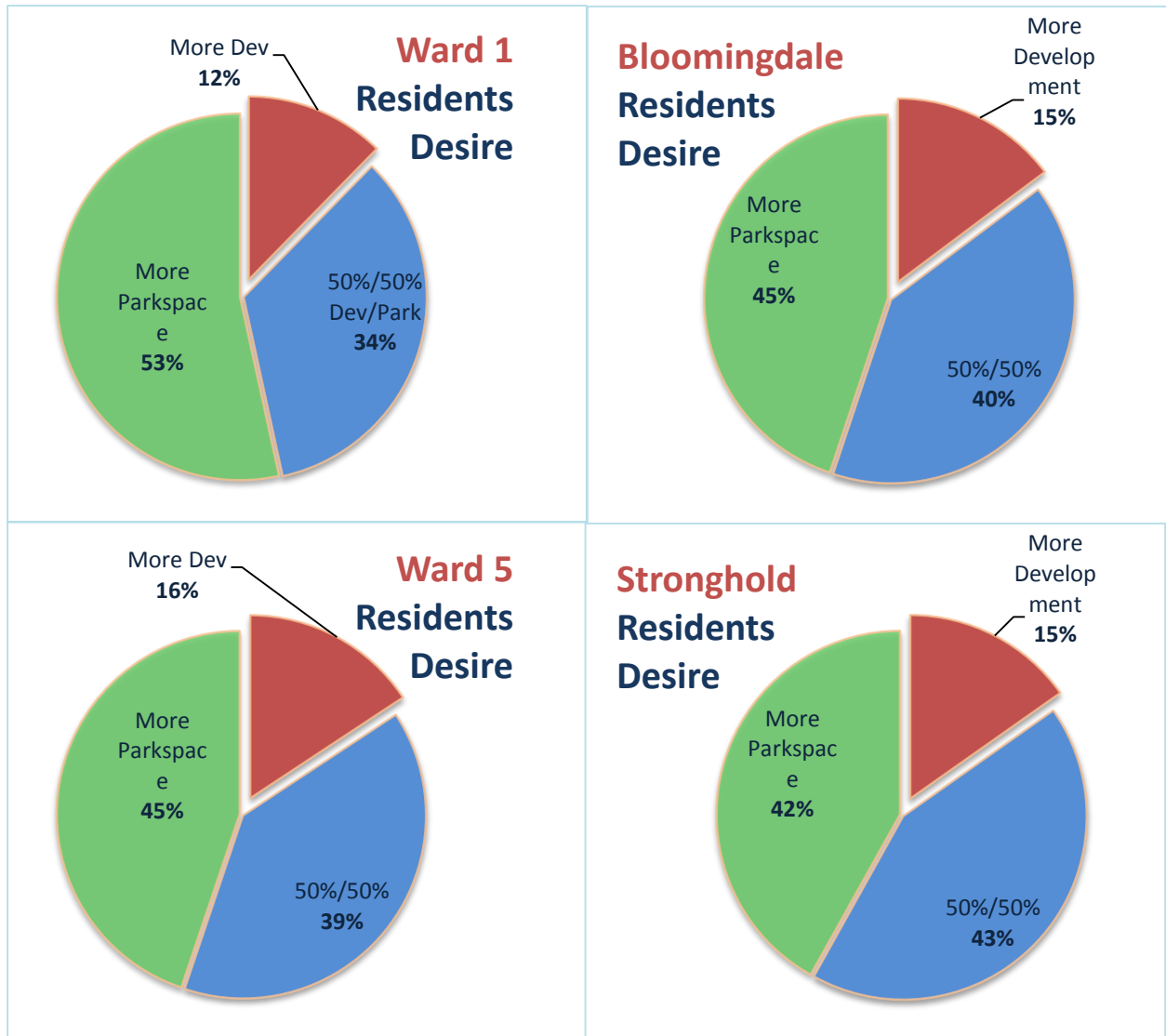


Figure 5. Two Major Communities and Wards’ Residents’ Desire for More Dev./ Park in McMillan Park Survey

From the 4 pie charts above, we know that Bloomingdale and Stronghold residents basically have the same desire (85%) for at least 50% park space. Ward 1 and Ward 5 have the same high desire for park space, with 88% and 84% respectively. Coincidentally, this falls in line with the 2001 Office of Planning guidelines, which suggests at least 50% of the land be preserved as park space.

**Table 3. Residents Desire for More Park Space (50% or more land) Per Major Community**

<i>Residents</i>	<i>Sample Size</i>	<i>Population</i>	<i>Desire for More Park Space</i>	<i>Standard Deviation</i>	<i>95% Confidence Interval</i>
Bloomingtondale	332	4994	85.24%	0.0195	(81.4%, 89.0%)
Stronghold	105	1333	84.76%	0.0351	(77.9%, 91.6%)
Ward 5	687	74308	84.28%	0.0139	(81.6%, 87.0%)

All demographic information listed above is from: [Neighborhoodinfodc.com](http://Neighborhoodinfodc.com), updated to 2010.

Residents desire at least 50% of the land to be preserved as park space.

Compared to the overall population, our sample size in Bloomingtondale and Stronghold is big enough. Residents’ desire for park space, listed in Table 3, shows 85% of residents prefer 50% or more park space in McMillan Park. The acceptable error is less than 5%, with 95% confidence interval (CI) between 80% and 90%. This means we can be 95% confident that 80% to 90% of the residents desire more Park space in McMillan Park.

**3. Importance Features of Amenity**

**Methodology:**

Excel Pivot table was used to calculate the number of each amenity importance level. Then, a weight of 1, 2, or 3 was assigned to each level, with 1 representing the most Important, 2 representing Neutral and 3 representing Least Important. These numbers were added together and then divided by the total number for each amenity. In this way, we calculate the Average Rating for each Amenity. Using statistical method, we got a 95% Confidence Interval of the range of rating. As for the sample size, the margin of error is not big, making the CI acceptable with 95% significance level, meaning there is no more than 5% chance the rating is not within our confidence interval.

**a) All people surveyed**

**Table 4. Amenity Summary (in order of importance)**

<i>Amenity</i>	<i>N sample size</i>	<i>Average Rating</i>	<i>95% Confidence Interval</i>
----------------	----------------------	-----------------------	--------------------------------

Public Park	886	1.26	(1.22, 1.30)
Preserve Cavern	889	1.40	(1.35, 1.44)
Rec Center	888	1.54	(1.50, 1.59)
Restaurant	881	1.68	(1.63, 1.73)
Grocery Store	885	1.76	(1.70, 1.81)
Retail	881	2.12	(2.07, 2.18)
Housing	882	2.13	(2.08, 2.18)
Offices	887	2.61	(2.57, 2.65)

As the standard error is small, the 95% Confidence Intervals for each Amenity are fairly narrow. So, the Average Rating is accurate and we are 95% confident that the true resident desire for amenities is within our confidence interval.

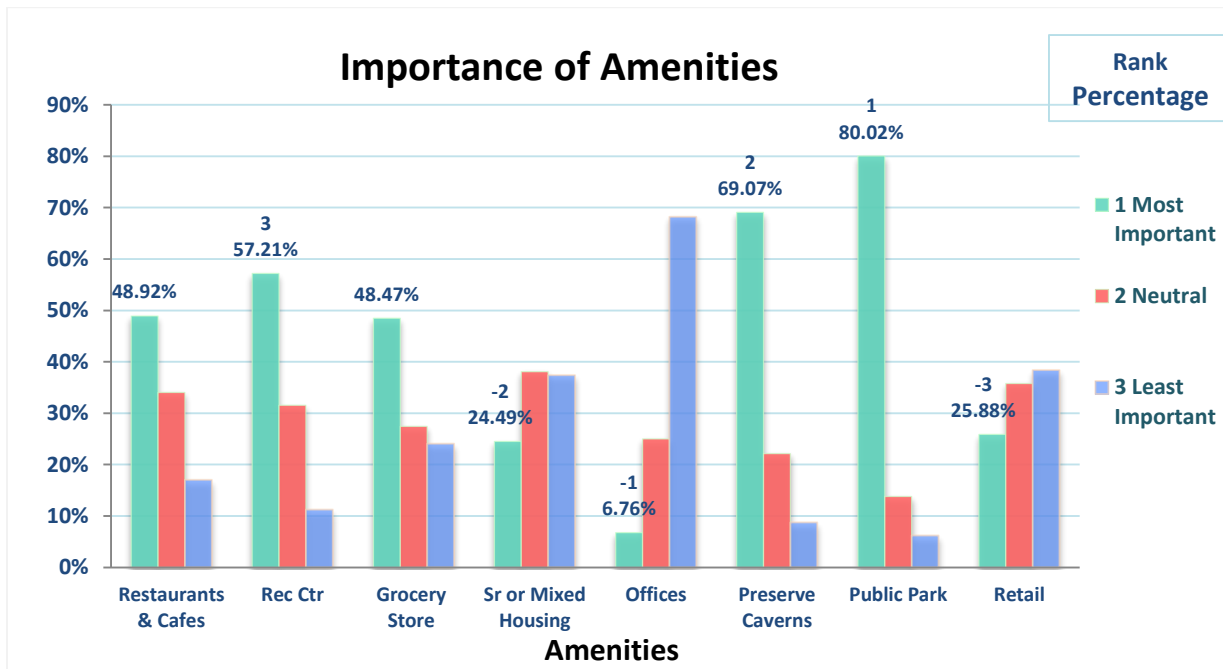


Figure 6. Bar Chart for Importance Features Analysis of Each Amenity

This Bar Chart indicates residents have the same trends in desire for Restaurants, Recreation Center, Grocery Store, Preserved Caverns and Public Park. More than 50% of the residents marked these amenities as “Most Important”. On the other hand, according to survey results, most residents take a higher proportion of their desire for Housing, Retail and Offices as the “Least Important” Amenities.

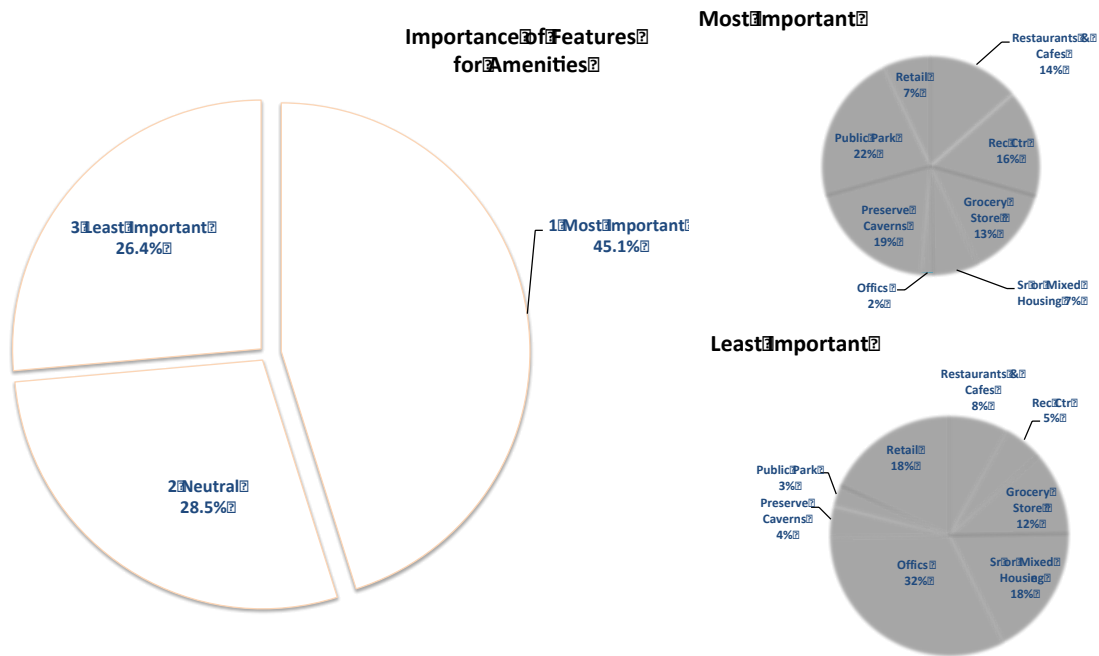


Figure 7. Pie Chart for Importance of Each Amenity Separated by Most Important Chart (how often each amenity got rated as 1) and Least Important Chart (how often each amenity got rated as 3). Larger pie chart indicates how often respondents chose 1, 2 or 3 overall.

The Pie Chart also illustrates the same trends. In the Most Important Pie Chart, amenities with big portions have smaller portions in the Least Important Pie Chart.

Figure 8. Stacked Marked Line Chart for Importance of Amenities

Note:

Using answers to the survey question “Which Picture comes closest to the amount of Development & Park space you prefer at the site”, all surveyed are broken into 3 groupings: 1. Those wanting “more” park space = those who chose 75% or 100% park space (45% of those surveyed)

**Xi Meng**

George Washington University

Final Version 1



- 2. Those wanting more development, = those who chose 75% or 100% development (15% of those surveyed)
- 3. Others (not used in the following analysis) = those who chose 50% of each(40% of those surveyed)

Smaller numbers in the chart = higher importance.  
Higher numbers in the chart = lower importance



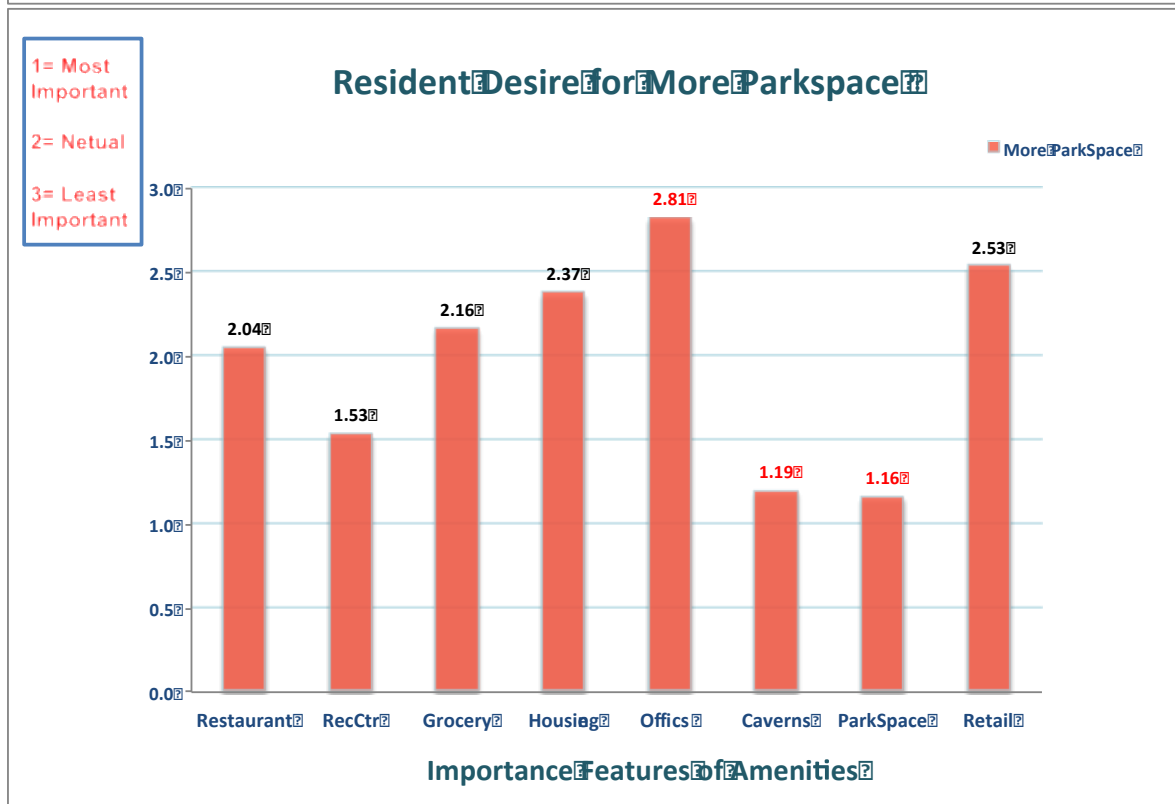
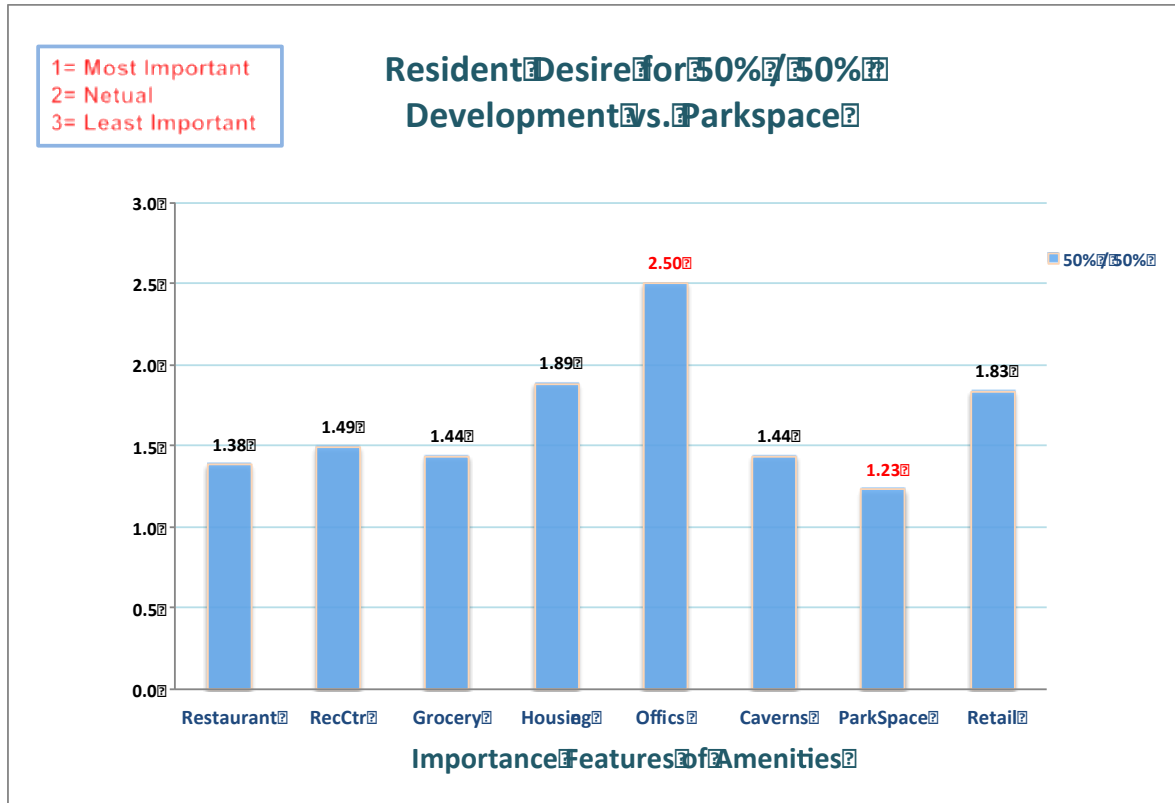


Figure 8. Separate Bar Chart for Importance of Amenities for All Residents Surveyed

Note for mark—place pie chart here from free writing

b) For Residents in Bloomingdale

Table 5. Amenity Summary for Bloomingdale

<i>Amenity</i>	<i>N sample size</i>	<i>Average Rating</i>	<i>95% Confidence Interval</i>
Public Park	332	1.23	(1.17, 1.29)
Preserve Cavern	334	1.43	(1.36, 1.50)
Rec Center	335	1.55	(1.47, 1.62)
Restaurant	333	1.64	(1.55, 1.72)
Grocery Store	335	1.70	(1.61, 1.79)
Retail	330	2.12	(2.03, 2.21)
Housing	330	2.22	(2.14, 2.30)
Offices	333	2.66	(2.60, 2.72)

Note: 1= Most Important, 2= Neutral and 3= Least Important

The Average Rating is consistent with all resident rating. But the range of 95% Confidence Interval becomes a little wider than the whole survey.

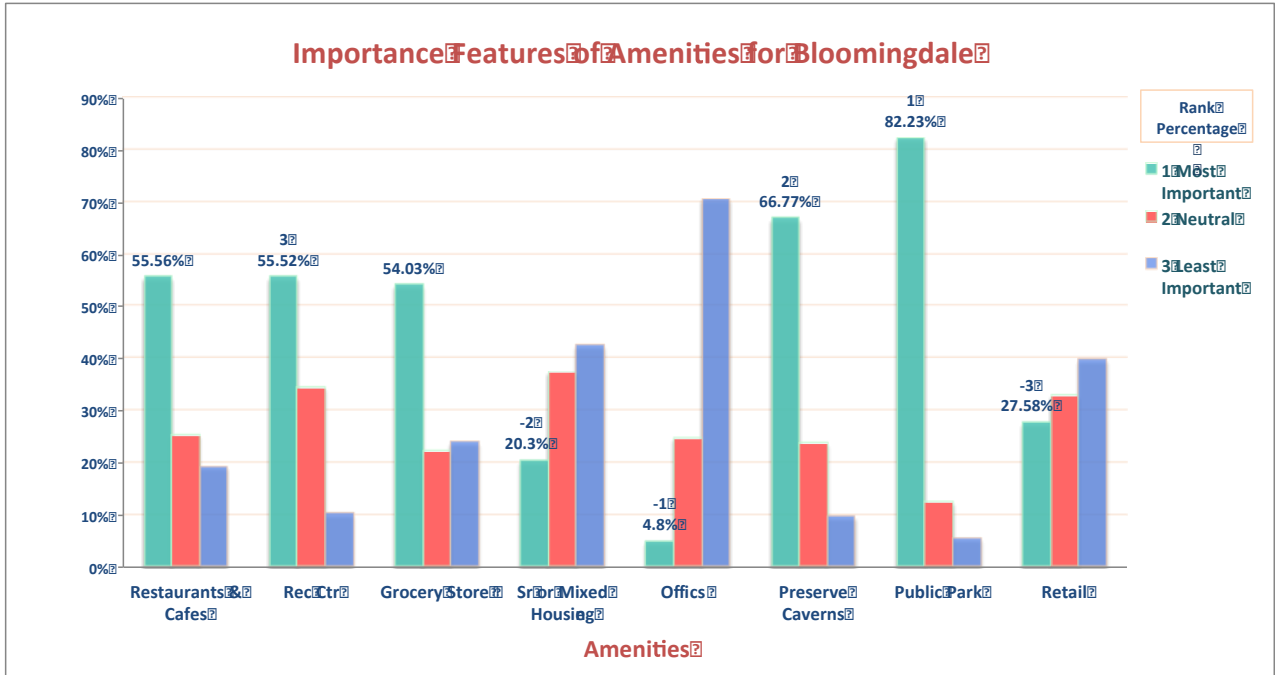
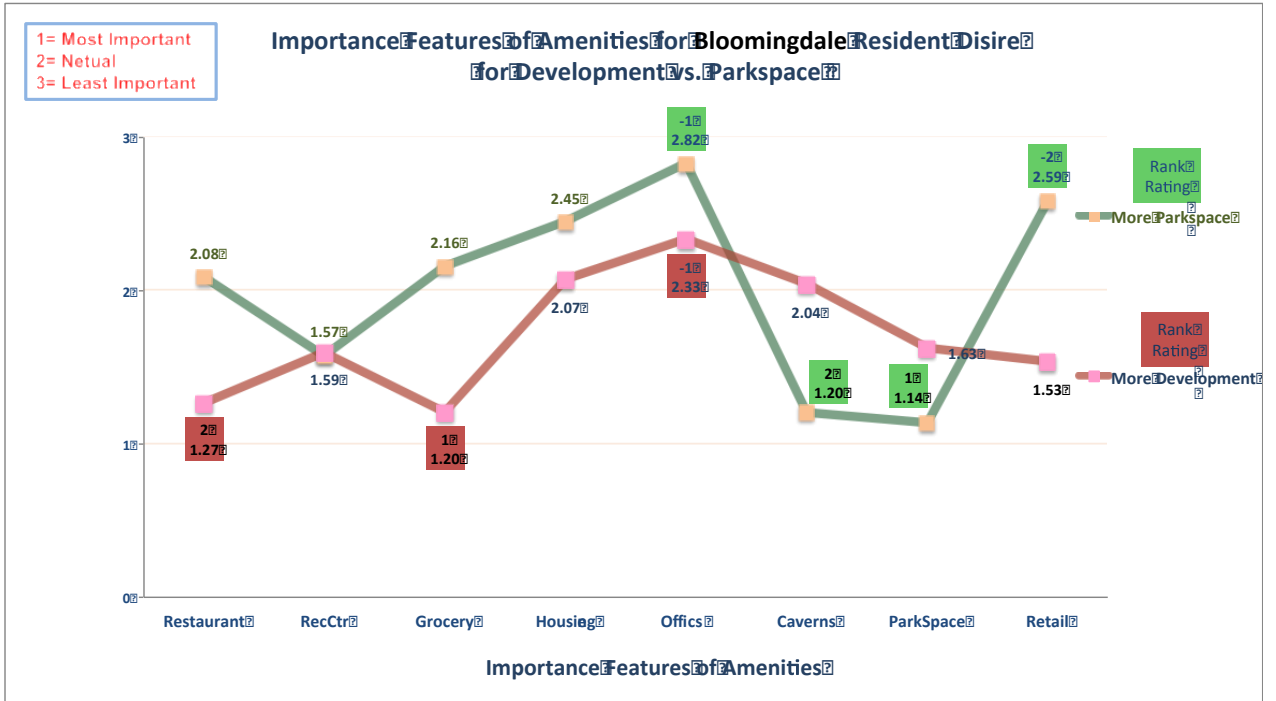


Figure 9. Chart for Analysis of Each Amenity’s Importance for Bloomingdale

Note: The Importance of Amenities for Bloomingdale has the same trend as when all residents together are charted.



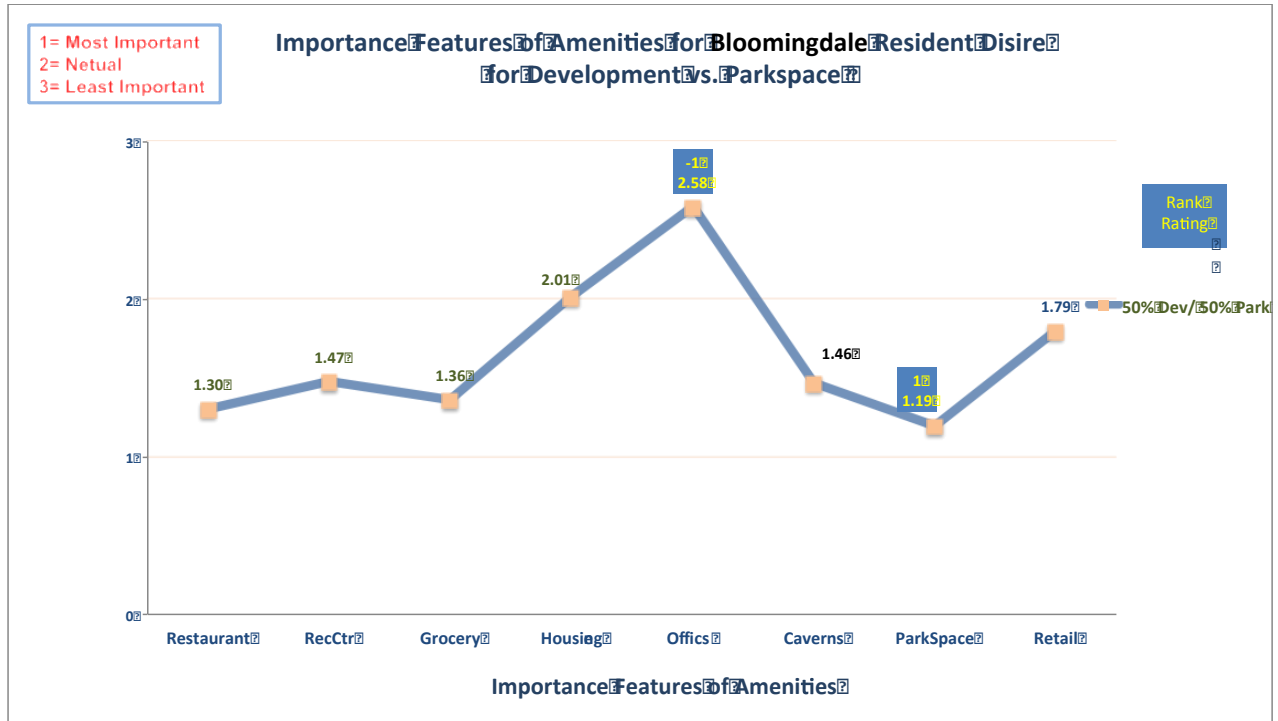


Figure 10. Marked Line Chart for Importance Features Analysis of Amenities for Bloomingdale Resident Desire for Development vs. Park Space

When Bloomingdale residents are grouped based on their desire for development, some amenities have opposite ranking. The 15% of Bloomingdale residents desiring more development consider Grocery Store and Restaurants as most important, while, the 45% of Bloomingdale residents desiring more park space consider Park space and Underground Caverns as the most important amenities. All residents consider Offices to be the least important amenity.

Bloomingdale’s preferences for underground caverns and retail graph in the same way as when all residents are graphed together.

c) For Residents in Stronghold

Table 6. Amenity Summary for Stronghold

Amenity	N sample size	Average Rating	95% Confidence Interval
Public Park	103	1.34	(1.21, 1.46)
Rec Center	104	1.385	(1.26, 1.51)
Preserve Cavern	104	1.44	(1.32, 1.56)

Grocery Store	105	1.66	(1.50, 1.81)
Restaurant	104	1.85	(1.70, 1.99)
Housing	104	1.93	(1.78, 2.08)
Retail	101	2.21	(2.06, 2.35)
Offices	104	2.49	(2.35, 2.63)

Note: 1= Most Important, 2= Neutral and 3= Least Important

The Average Amenity Rating for Stronghold Resident is from 1.34 to 2.49. Compared with Bloomingdale Resident (1.23 to 2.66) and All Residents (1.26 to 2.61), the rating range is narrower, showing Stronghold residents' preference for amenities on the McMillan Park site is evenly distributed. But the range of 95% Confidence Interval here are wider than Bloomingdale and all survey residents.

Also, the rank of Average Rating is different from the previous two groups. Stronghold Residents rank Recreation Center as the Second Most Important amenity, not the Preserve Caverns. Also, Stronghold puts less value on Retail. They make it the Second Least Important Amenity, only above Offices.

More details are displayed in Figure 11.

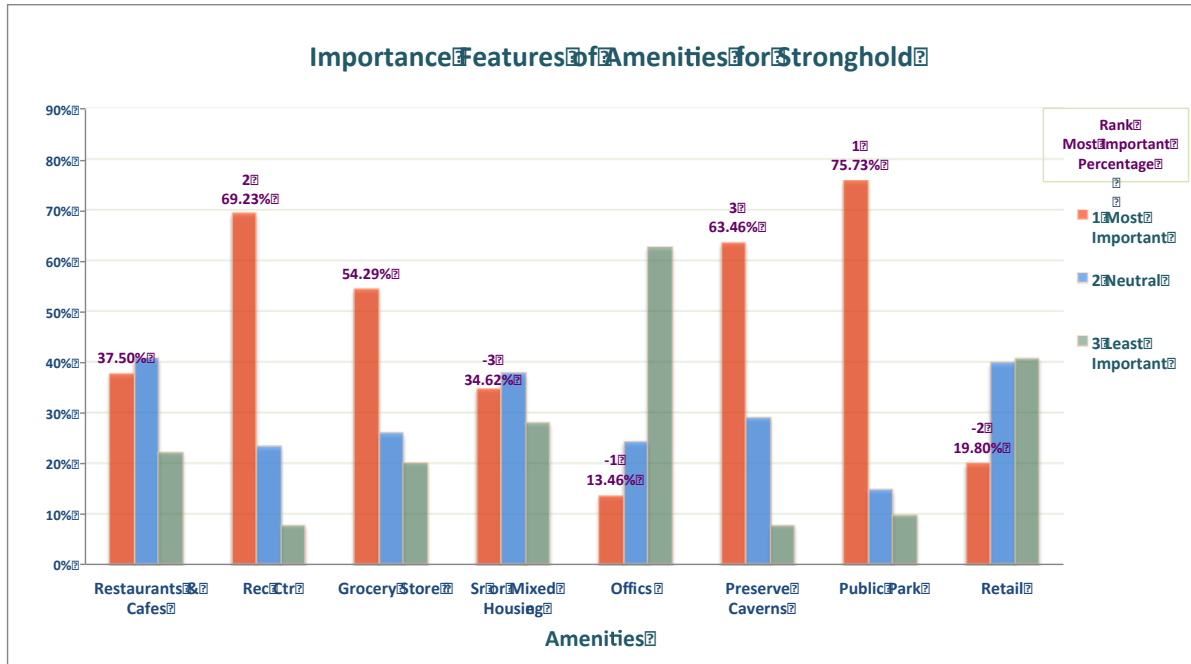


Figure 11. Bar Chart for Importance Features Analysis of Amenities for Stronghold

We can see that Stronghold Residents are not that zealous to put all their choice on the Public Park and Preserve Caverns and blind to think Offices and Housing are the Least Important Amenities. Because the Bar Chart of percentage shows that only 75% and 63% of Stronghold Residents consider Park and Caverns are the Most Important one. While, the percentages for Bloomingdale are 82% and 67%, which is much higher than Stronghold. As for Offices distribution, they are kind of cool to have some offices on the McMillan Park site, which 13.5% residents put the Most important level for Offices, not like Bloomingdale, less than 5% residents think offices are important.

But Stronghold Residents have higher preference for Recreation Center, which is 70%, much higher than Bloomingdale (55.5%) and all combined people (57%). Also for Housing, 35% residents feel that Housing is most important, while only 20% Bloomingdale residents feel the same way.

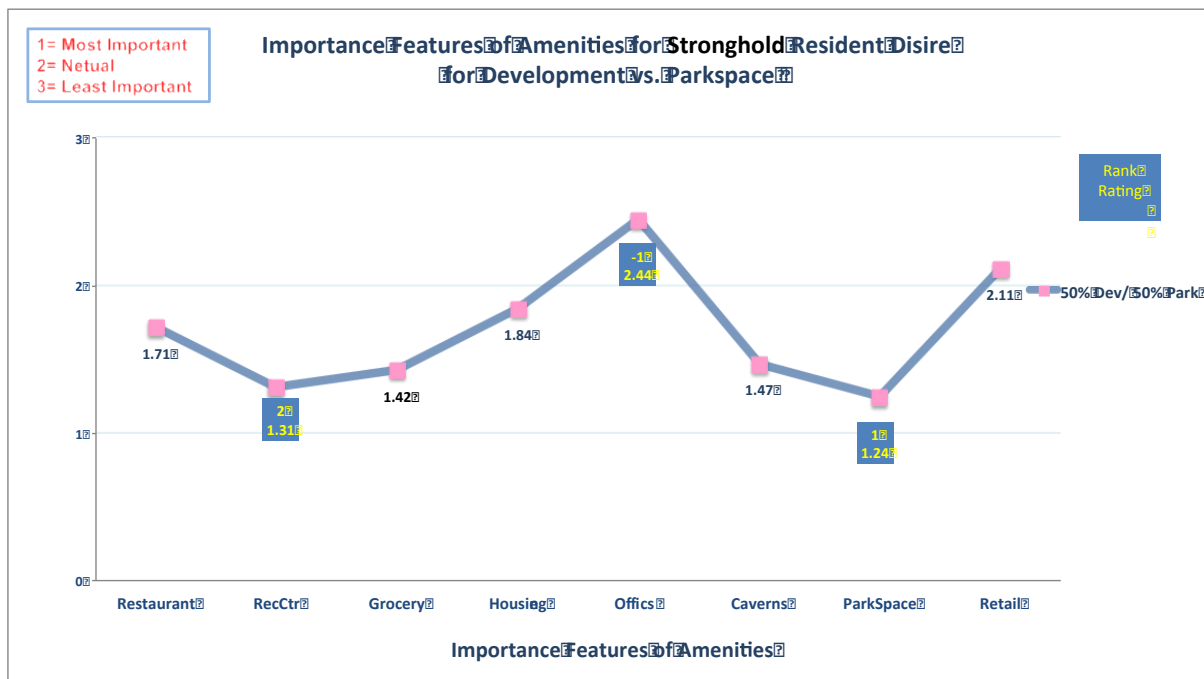
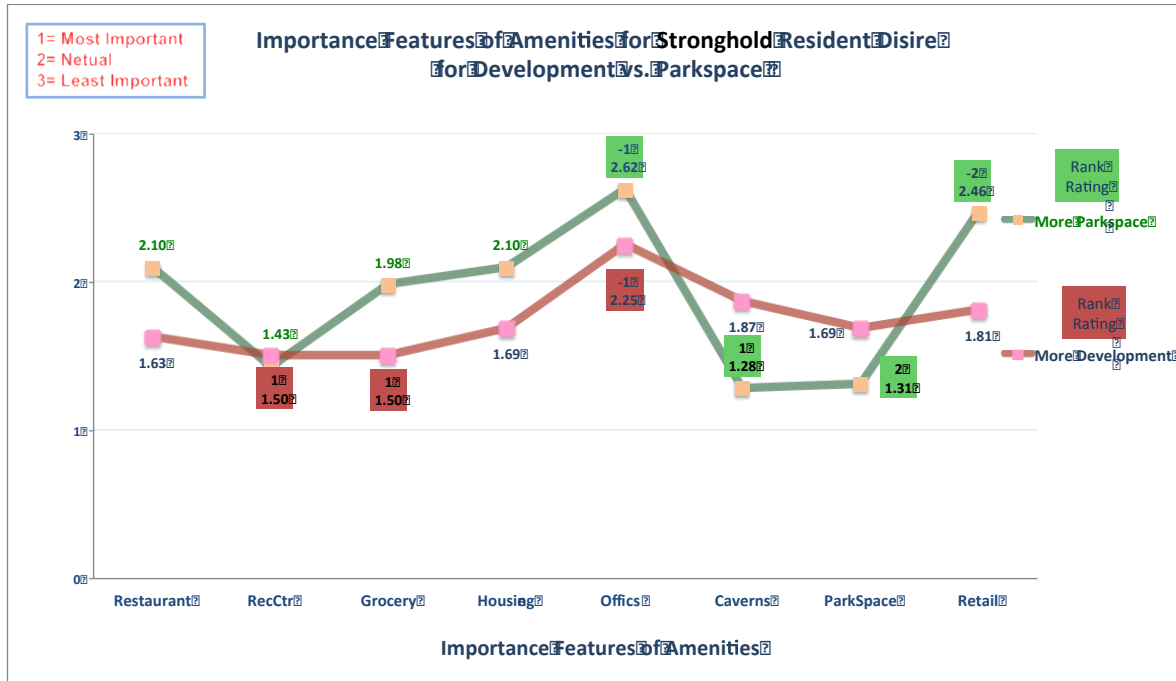


Figure 12. Marked Line Charts for Importance of Amenities for Stronghold Residents based on their Desire for Development vs. Park Space

The top chart has Stronghold Residents separated into two groups, those desiring more development and those desiring more park space. They have the same trends as when all



residents are surveyed together, except that residents who desire more development hold a Recreation Center in higher importance than Restaurants.

The line for those wanting more Development is smoother that the more jagged line seen for those desiring more park space.

**4. Importance of Amenities based on number of Years living in Ward 5**

Question: Does length of residency affect preference?

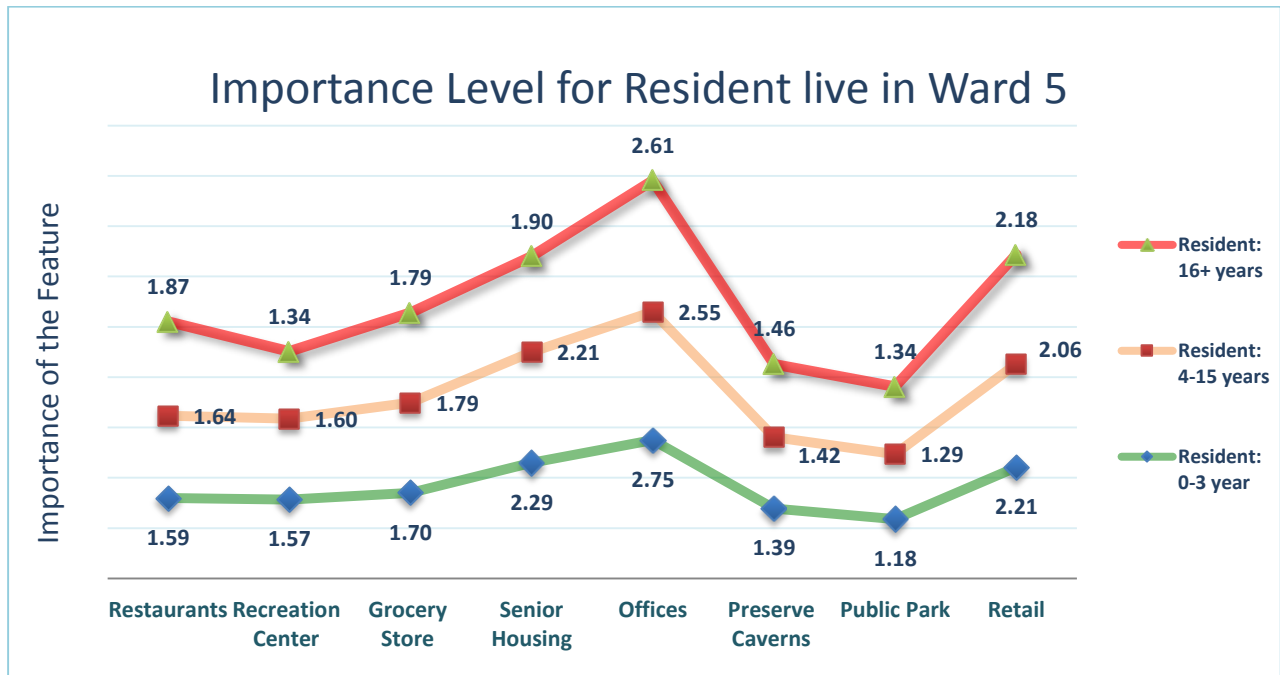


Figure 13. Marked Line Chart for Importance of Amenities based on number of years living in Ward 5.

Newer residents (living in Ward 5 for less than 15 years) have the same trends as longer term residents in their desire for various amenities. The most important amenity for all residents is the public park, and interest goes up slightly for newer residents. The underground caverns have the second highest ranking for all residents, no matter how long they live in Ward 5. Out of the 20 underground caverns, the current VMP plan offers to save one underground cavern and are unsure about saving part of a 2<sup>nd</sup> cavern. This does not fall in line with the 2001 Office of Planning guidelines, which suggests saving at least 9 caverns. Senior residents may have slightly more preference than newer residents for a recreation center.

Overall, the length of residency dose not affects the Amenities preference.

Xi Meng

George Washington University

Final Version 1

5. Bias of Data Collectors

Table 7. Summary Description for Data Collectors

<i>Surveyors</i>	<i>Counts</i>	<i>Percentage</i>	<i>Completion</i>	<i>Completion Rate</i>
Hugh	93	10.1%	88	94.6%
Kirby	158	17.2%	75	47.5%
Kit	120	13.1%	114	95%
Mark Muller	317	34.6%	309	97.5%
Park Place	50	5.5%	46	92%
Others	179	19.5%	160	89.4%
<b>Total</b>	<b>917</b>	<b>100%</b>	<b>792</b>	<b>86.4%</b>

There are at least 27 surveyors who participated in the McMillan Park 2012 survey collection. We choose surveyors who collected data from more than 50 residents as listed in Table 7. The surveyors who collected data from less than 50 are considered as others. Park Place residents provided their surveys through their security guard, therefore we consider Park Place as a “surveyor” for bias analysis.

From the Table 7, we can see that Mark Muller has collected the most data, which covers 34.6% of total and the data also has the highest completion rate (97.5%).

\*Notice here, Kirby took 158 people on survey, but only has 47.5% completion rate, because he recorded more homes that refused to take the survey. It makes the total completion rate reach below 87%.

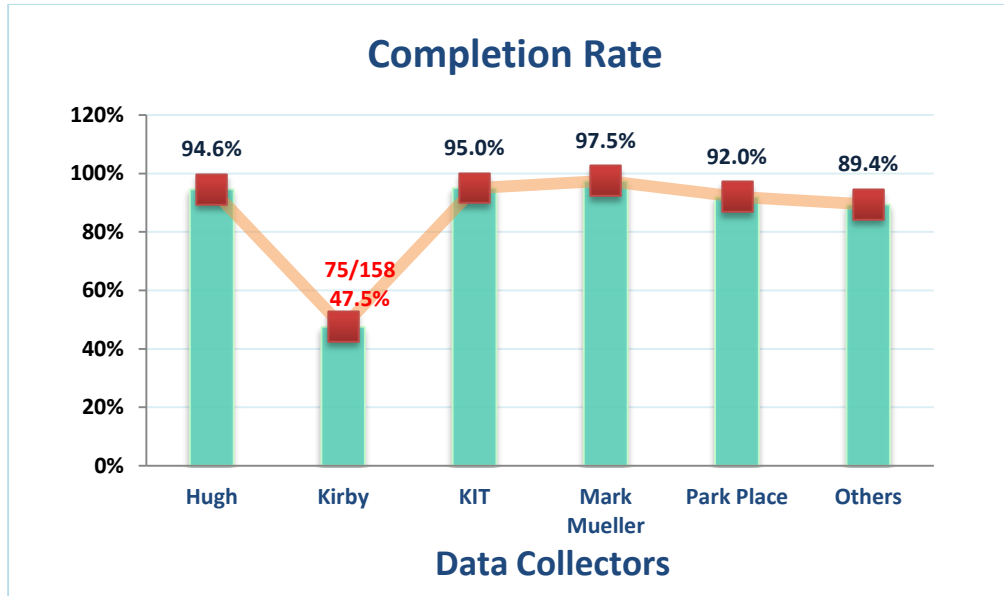


Figure 14. Bar chart of Completion Rate for different Data Collectors. Note, Kirby’s completion rate also includes residents that refused to take the survey, which factors in as “incomplete”.

a) Resident Desire for %Dev. and %Park Space

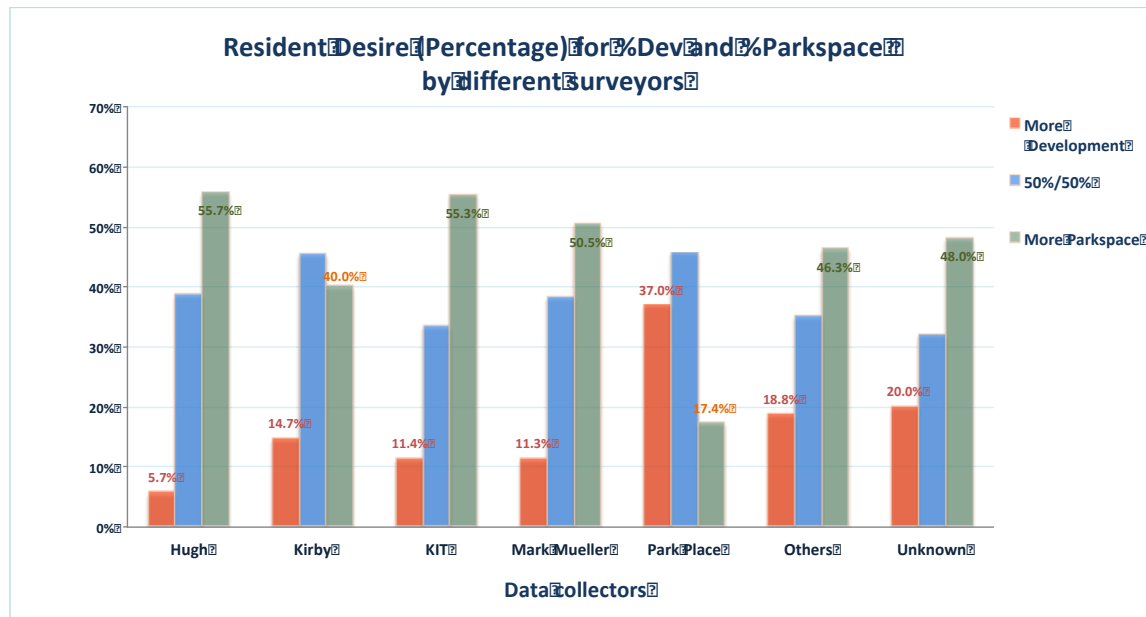


Figure 15. Bar chart of Residents Desire for different Data Collectors

Different data collectors almost have same trend in Dev. and Park Space preference, people want more Park Space is more than people want even space for Dev. and Park, but except for Kirby and Park Place. For survey took on the Park Place, there is only 17.4% residents like

more Park Space, and more than 37% residents prefer more Development. This result is against the whole survey result. We may look the detail distribution of these two surveyors to find out the reasons. See below figures.

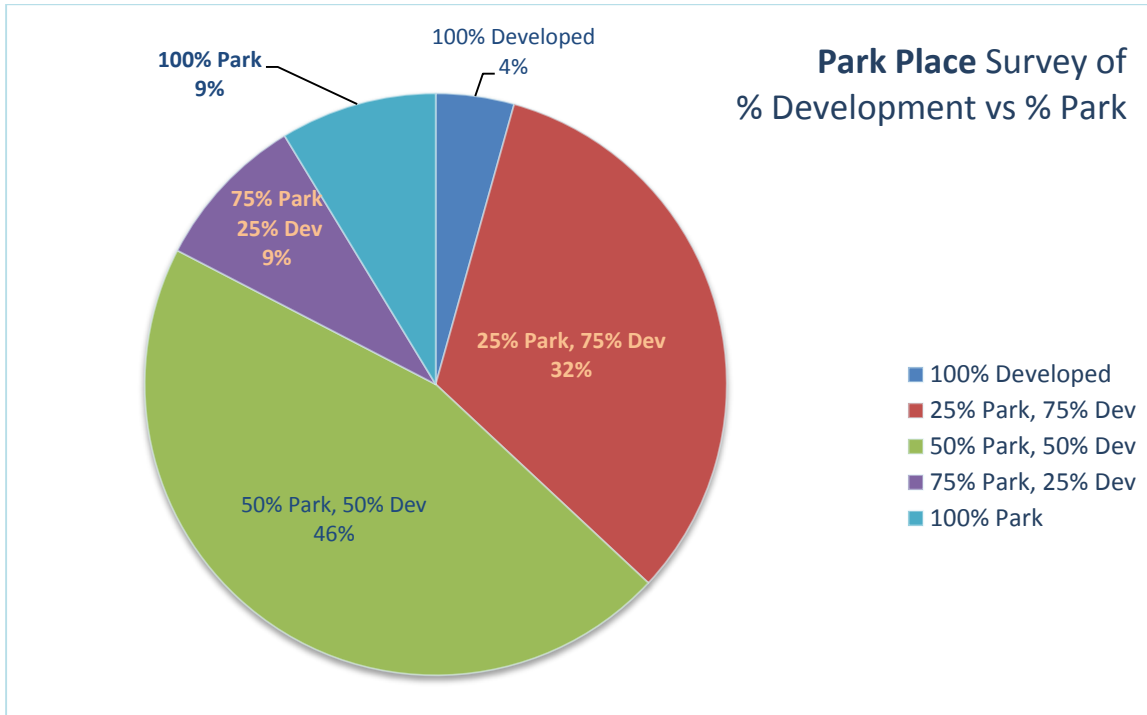


Figure 16. Pie chart of Residents Desire for Data Collected on Park Place

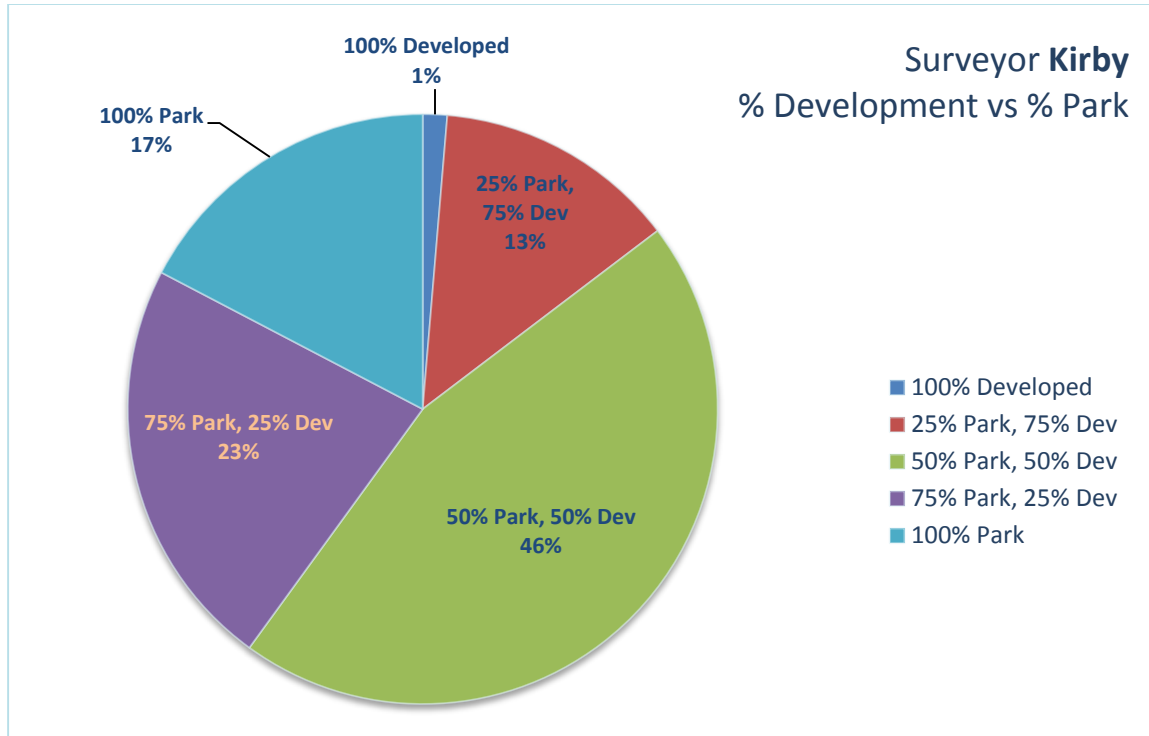
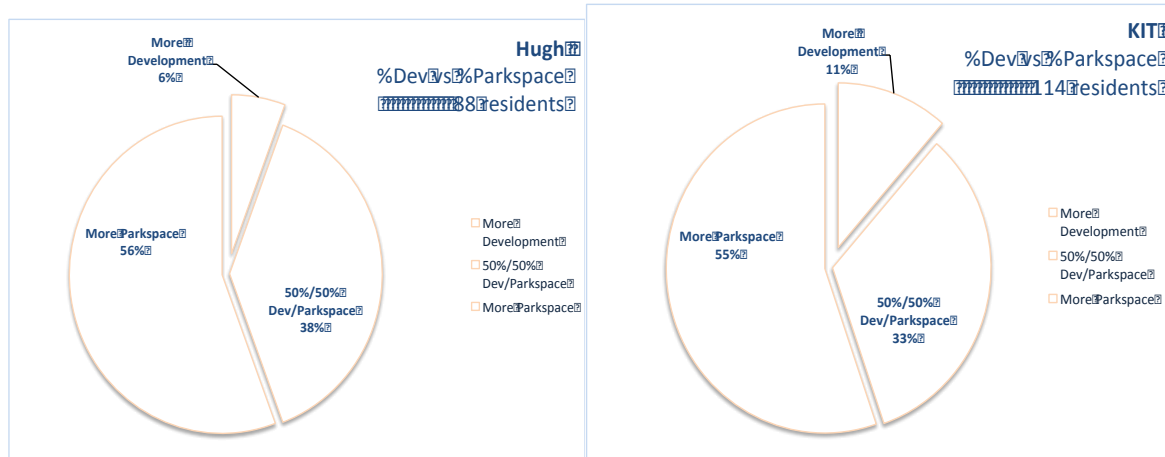


Figure 17. Pie chart of Residents Desire for Data Collector Kirby

Most residents have neutral opinions about Dev. or Park Space issue. About half of them choose even space for Development and Park Space.



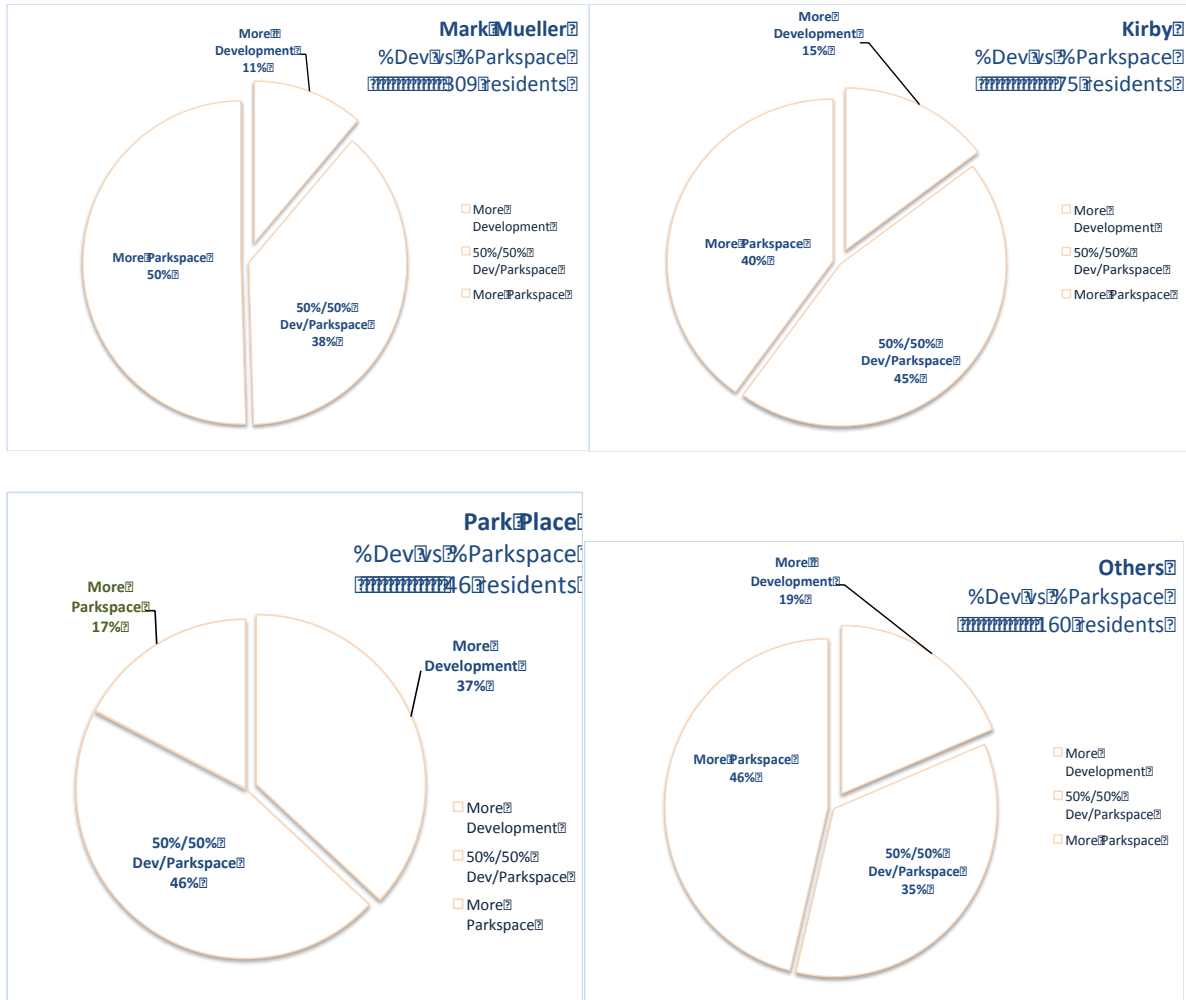


Figure 18. Pie chart of Residents Desire for different Data Collectors

**b) Completion Rate analysis for Kirby**

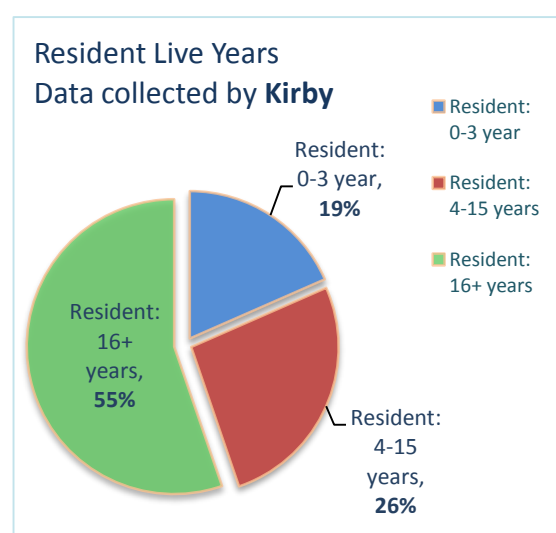
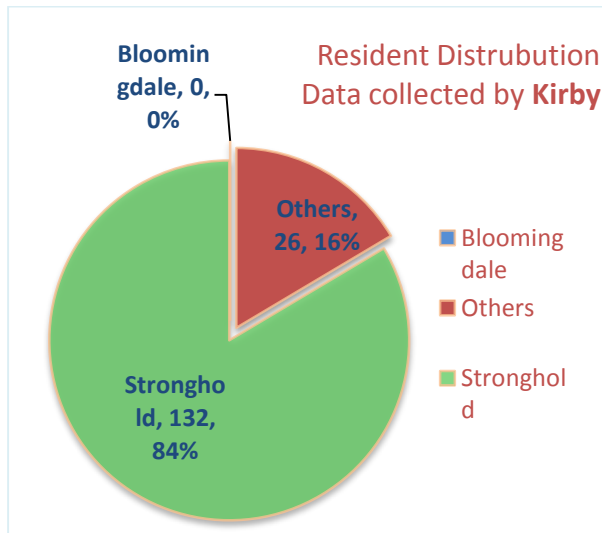
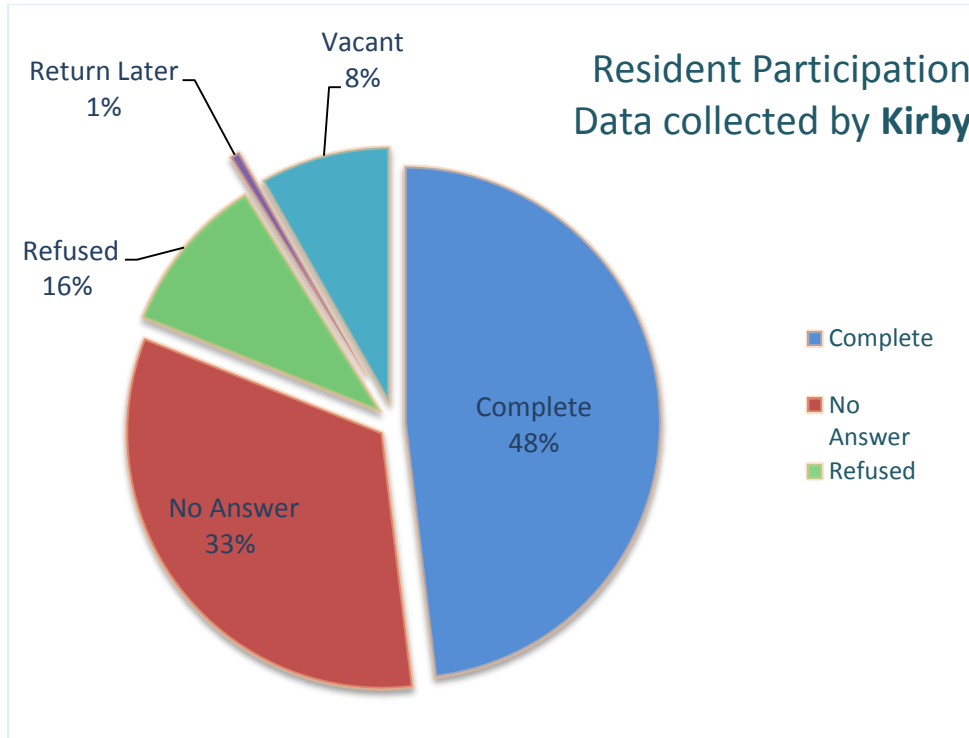


Figure 19. Pie chart of Resident analysis for Data Collector, Kirby

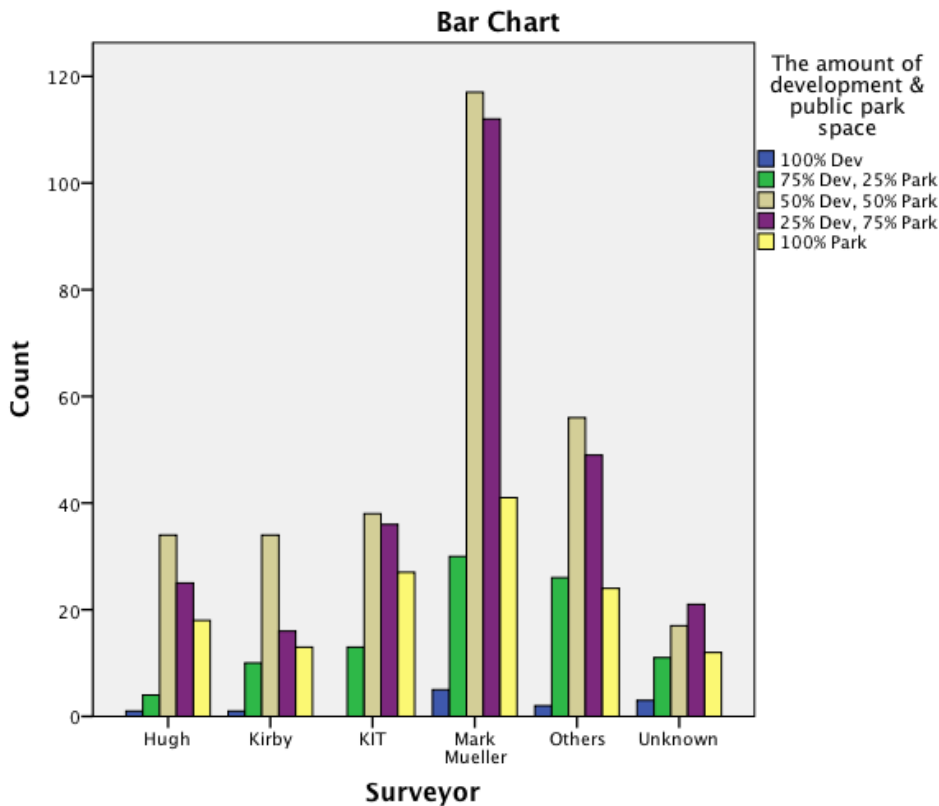
Most data Kirby collected came from Stronghold community and senior residents take up 55%, which is a big part. Since many senior residents don't want to take survey or don't remember to return the survey, which may be the reason that the participation rate is so low.

c) Cross-tabulation analysis for data collectors

We have used Excel to analysis that different data collector almost have the same trend in residents desire preference. But Park Place has a big different from others surveyors. So, there I remove Park Place and add unknown to our bias analysis to see whether surveyors have bias in collecting survey data. Below is the SPSS analysis.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	31.248 <sup>a</sup>	20	.052
Likelihood Ratio	32.047	20	.043
Linear-by-Linear Association	2.968	1	.085
N of Valid Cases	796		

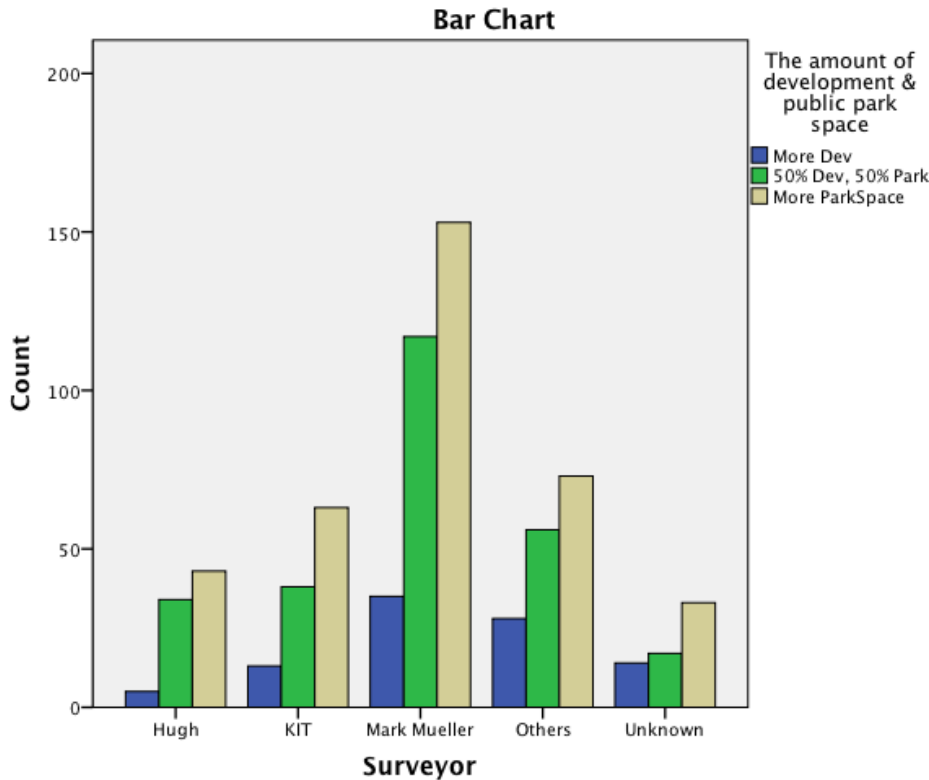




From the Bar chart, we can see the distribution of Dev. & Park Space for different data collectors almost the same. But the P-value of Chi-square is 0.052, not significant less than 0.05. So, we cannot say that these collectors have same collection results, which means there may have some bias.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.351 <sup>a</sup>	8	.073
Likelihood Ratio	14.436	8	.071
Linear-by-Linear Association	4.479	1	.034
N of Valid Cases	722		



This time, we remove data collector Kirby, who has a little different distribution from others, which we have shown in Figure 15 and 18. Then we do the cross-table analysis again to see

**Xi Meng**

George Washington University

Final Version 1

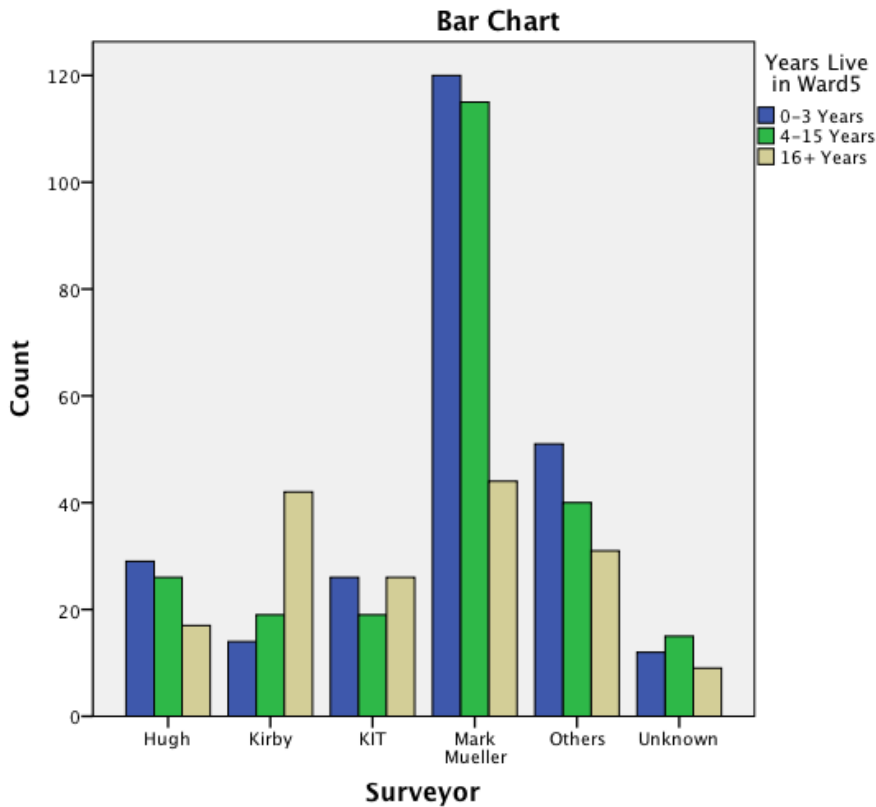
whether there is a relationship between surveyors and desire preference. If the result is not significant, that means there is no relationship or correlation between these two factors. That concludes different data collectors have no bias in collecting survey data, because they have the same performance in survey results.

From Chi-Square Test, we can see the P-value is 0.073 (>0.05), which is good. So the result is significant and means different data collectors have no bias, when we did not take Kirby into our analysis.

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	57.498 <sup>a</sup>	10	.000
Likelihood Ratio	54.234	10	.000
Linear-by-Linear Association	7.863	1	.005
N of Valid Cases	655		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 9.29.



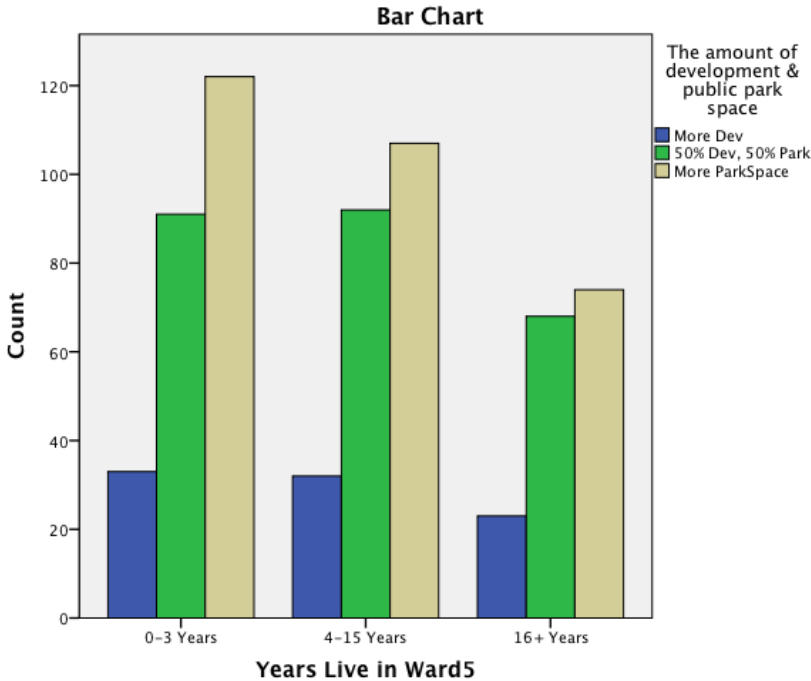
There is an association between data collectors and resident live years, since the Pearson Chi-Square value is 57.498 with  $p < 0.001$ . Also from Likelihood Ratio two-side test is  $p < 0.01$  and collector Kirby has more senior residents showed in the Bar Chart. All of the results are consistent in leading to rejection of the null hypothesis at the  $\alpha = 0.05$  level and thus to the conclusion that there is a relationship between the data collectors and residents timing in the neighborhood. That means different collectors may have collected different types of residents' distribution, such as Kirby collected more senior residents while Hugh collected more young residents.

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.054 <sup>a</sup>	4	.901
Likelihood Ratio	1.055	4	.901
Linear-by-Linear Association	.593	1	.441

N of Valid Cases	642		
------------------	-----	--	--

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 22.62.



A Chi-Square test was performed to test the null hypothesis of no association between live years of residents and desire for Development & Public Park Space. Based on the Pearson Chi-Square value in the table,  $\chi^2=1.054$  with  $p = 0.901$ , we cannot reject the null hypothesis at the  $\alpha = 0.05$  level and thus to the conclusion that the seniors, juniors and new comers have the same trend of desire for the Dev. & Park Space.

But more specifically, the seniors prefer more 50%/50% Dev./Park ratio than new comers (41.2% / 37%), and on the other hand, they pay less attention on more Park Space than others (44.8% / 49.6%). These results are consistent with our Excel analysis showed in Figure 13.

### **Survey Conclusion**

- I. The valid number of respondents in the McMillan Park 2012 survey analysis is 983 and they are mainly from Bloomingdale and Stronghold communities.
- II. 70% of respondents in the analysis live in Ward 5, where McMillan Park is located.
- III. The participant rate in McMillan Park 2012 survey analysis is 89%.
- IV. The sample taking from Ward 5 is big enough to draw statistical conclusion that about 86% of residents are willing to have at least 50% Park Space in McMillan Park. Also, since the margin of error is small, we can be 95% confident that about 81.4% to 89% of Bloomingdale residents desire 50% or more Park Space; about 77.9% to 91.6% Stronghold residents desire 50% or more Park Space and about 81.6% to 87% of Ward 5 residents desire 50% or more park space..
- V. The overall ranking of amenity importance from MOST important to LEAST important is as follows: Public Park, Preserve Cavern, Rec Center, Restaurant, Grocery Store, Retail, Housing and Offices. (Rank from Most Important to Least Important)
- VI. The length of residency does not affect the Amenities preference.
- VII. Different data collectors have no bias in collecting survey data. Kirby recorded more addresses that refused to take the survey, which gives the appearance of fewer completions.