

Provo Preliminary Parking Standard Survey

Performed by members of the Student - Provo City Alliance
February 3, 2010

Purpose:

Determine a relevant parking standard for the proposed apartment complex, *The Isles*, and develop a method to create a parking standard for all future housing complexes in the Joaquin neighborhood.

Questions to be answered:

- What percentage of renters own cars that live in apartment complexes similar to *The Isles*?
- Which factors influence car ownership?
 1. Is car ownership influenced by Age/Gender/Marital status, and by how much?
 2. Is car ownership influenced by whether the student attends BYU/UVU/other schools, and by how much?
 3. Is car ownership influenced by the renter's proximity to BYU campus?
 4. Is car ownership influenced by the rental units' monthly rent, and by how much?
 5. Do any other factors influence car ownership? (Housing type, number of renters per unit, etc.)

Methods:

In order to answer the questions above, a basic survey sheet was prepared, which collected information from individuals about their gender, marital status, monthly rent, student status, and most importantly, whether they had a car. (A sample is shown in the Appendix) Individual surveyors went to the complexes of *Lanai Apartments*, *SpyGlas Court*, *Santa Barbara*, and *Old Academy*. These apartments were chosen because they seemed to best resemble *The Isles*, in that they exist close to BYU campus, housed predominantly single male and female renters, and were recently constructed. Bavarian Apartments were initially intended to be surveyed, but they house predominantly married couples which would not coincide with *The Isles*. These surveys were performed between January 23rd 2010 and February 2nd 2010.

All available renters were invited participate in the survey, and because only a small proportion of the renters were at home at the time of the survey, those that were home were asked if they knew the information for their roommates. In most cases, this information was known and recorded as a survey entry, resulting in a more complete study. Because random sampling is important, and yet a larger number of participants yield a stronger confidence of results, every door of each complex was approached. In *SpyGlas* and *Old Academy*, almost all of the renters were surveyed. A smaller proportion of *Lanai Apartments* and *Santa Barbara* were available, and each complex was revisited to survey those that weren't available the first time.

In order to compare the parking ratio of new complexes with those that are older, *The Elms* was also surveyed. The data analysis only includes single renters, even though a couple units within *Santa Barbara* were married housing, for more married housing data is needed in order to include it in the analysis.

Results:

The four complexes of interest have very similar car ownership ratios. Distributions are shown on the plot on the previous page and averages from the survey are as follows:

Complex	Average Car Ownership	95% Confidence min.	95% Confidence max.
Lanai Apartments	93.4%	86.2%	96.8%
SpyGlas Court	86.8%	76.6%	92.8%
Old Academy	87.0%	79.8%	91.7%
Santa Barbara	86.6%	77.2%	92.4%
Total Average	88.5%	84.6%	91.2%

The line plots on the previous page represent the confidence of each ratio at each complex. For each of these distributions, an infinite population is assumed. In other words, this represents the distribution of the demographic at each complex. For the actual car ownership at each complex, the 95% confidence range is much smaller, and the average is the same. (For SpyGlas Court, only one apartment was not surveyed, so the average ownership percentage is almost exact to within a couple percentage points) The distributions shown are more useful because they represent the car ownership ratios that will remain unchanged year to year, until another factor causes them to change.

The Elms had a much lower percentage of car ownership, presumably due to lower rent, older units, or more people per unit and shared rooms. The average ownership was 56.9% with a 95% confidence range of 50.2% - 62.6%.

Because the complexes surveyed are all similar in monthly rent, housing types, and renting to single students, the effects of these factors could not be calculated. However, age had a strong impact on car ownership, as did gender, if age was not taken into account. In other words, men's housing is more likely to have more cars than women's housing, but this is due to men being older on average than women. Plots of car ownership for ages and gender are shown on the next two pages.

Bias:

Precautions were taken to reduce or eliminate any bias that might exist in this study. The only detectable and significant bias, as seen by the surveyors, may have arisen from the individuals that were not home to be surveyed. We do not believe that those who were not available are any *less* likely to have cars, nor do we believe they are significantly more likely to have cars. For this study we assumed that there was no difference. We also took precautions to avoid making any conclusions that were not statistically significant.

Concluding Remarks:

We, the implementers of this study, believe that this study is useful and factual. The data contained can benefit the city for many years and save time and resources. If anybody questions the validity of the data or calculations, they may contact us with questions or concerns, and may request a digital copy of the raw data. We also encourage anyone who desires to replicate or expand our study. We believe that any further studies will not contradict the data of this study, and more external data will increase the confidence and application of this data.

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Housing Complex: _____

Surveyor: _____

Date: _____

	Example:									
Apt No.	13E									
Gender	<input type="radio"/> Male <input checked="" type="radio"/> Female	<input type="radio"/> Male <input type="radio"/> Female	<input type="radio"/> Male <input type="radio"/> Female	<input type="radio"/> Male <input type="radio"/> Female	<input type="radio"/> Male <input type="radio"/> Female	<input type="radio"/> Male <input type="radio"/> Female	<input type="radio"/> Male <input type="radio"/> Female	<input type="radio"/> Male <input type="radio"/> Female	<input type="radio"/> Male <input type="radio"/> Female	<input type="radio"/> Male <input type="radio"/> Female
Age	21	Age:	Age:	Age:	Age:	Age:	Age:	Age:	Age:	Age:
What is your current marital status?	<input checked="" type="radio"/> Single <input type="radio"/> Married	<input type="radio"/> Single <input type="radio"/> Married	<input type="radio"/> Single <input type="radio"/> Married	<input type="radio"/> Single <input type="radio"/> Married	<input type="radio"/> Single <input type="radio"/> Married	<input type="radio"/> Single <input type="radio"/> Married	<input type="radio"/> Single <input type="radio"/> Married	<input type="radio"/> Single <input type="radio"/> Married	<input type="radio"/> Single <input type="radio"/> Married	<input type="radio"/> Single <input type="radio"/> Married
If single, how many people currently live in your apartment / housing unit?	4									
Are you currently a student?	<input type="radio"/> No <input type="radio"/> BYU <input checked="" type="radio"/> UVU <input type="radio"/> Other	<input type="radio"/> No <input type="radio"/> BYU <input type="radio"/> UVU <input type="radio"/> Other	<input type="radio"/> No <input type="radio"/> BYU <input type="radio"/> UVU <input type="radio"/> Other	<input type="radio"/> No <input type="radio"/> BYU <input type="radio"/> UVU <input type="radio"/> Other	<input type="radio"/> No <input type="radio"/> BYU <input type="radio"/> UVU <input type="radio"/> Other	<input type="radio"/> No <input type="radio"/> BYU <input type="radio"/> UVU <input type="radio"/> Other	<input type="radio"/> No <input type="radio"/> BYU <input type="radio"/> UVU <input type="radio"/> Other	<input type="radio"/> No <input type="radio"/> BYU <input type="radio"/> UVU <input type="radio"/> Other	<input type="radio"/> No <input type="radio"/> BYU <input type="radio"/> UVU <input type="radio"/> Other	<input type="radio"/> No <input type="radio"/> BYU <input type="radio"/> UVU <input type="radio"/> Other
What is your average monthly rent between September and April? (not including utilities)	\$ 345	\$	\$	\$	\$	\$	\$	\$	\$	\$
Do you have a car? If you have multiple cars, list number. If married, list how many cars between you and your spouse.	YES									

Apt No.										
Gender	<input type="radio"/> Male <input type="radio"/> Female	<input type="radio"/> Male <input type="radio"/> Female	<input type="radio"/> Male <input type="radio"/> Female	<input type="radio"/> Male <input type="radio"/> Female	<input type="radio"/> Male <input type="radio"/> Female	<input type="radio"/> Male <input type="radio"/> Female	<input type="radio"/> Male <input type="radio"/> Female	<input type="radio"/> Male <input type="radio"/> Female	<input type="radio"/> Male <input type="radio"/> Female	<input type="radio"/> Male <input type="radio"/> Female
Age	Age:	Age:	Age:	Age:	Age:	Age:	Age:	Age:	Age:	Age:
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If single, how many people currently live in your apartment / housing unit?										
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What is your average monthly rent between September and April? (not including utilities)	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
Do you have a car? If you have multiple cars, list number. If married, list how many cars between you and your spouse.										

*Because this survey is involved in Provo planning, only cars that exist in Provo should be counted. For this survey, it does not matter if the tenant is the actual title owner of the car, only that he/she is the current possessor.