

# **Benchmarking Tier-One Universities: “Keeping Up with the Joneses”**

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## **Introduction**

Over the last decade the U.S. News and World Report (USNWR) “America’s Best College” ranking system has shaped higher education policy as institutions across the United States strive to be listed as a top tier university or college. This ranking system relies upon several metrics, including strong metrics like student retention and graduation rates and more arbitrary measures like the peer analysis score, to compare institutions. While there are many critics of USNWR’s methodology, there is little doubt that the rankings have inspired many university administrators to adjust their policies to take the USNWR metrics into consideration and strive to produce the best outcomes possible to increase their institutions’ rankings. An example of this type of policy “adjustment” was raised by Catherine Watt, the former Institutional Research Director of Clemson University, who stated that class size was reduced by Clemson’s administration in order to achieve a higher USNWR ranking (Justin Pope, 2009). This drive to improve rankings can extend into state legislation. In 2009, the State of Texas designated seven of its public universities as “Emerging Universities”, thus making them eligible

to receive additional funding based on their abilities to boost their USNWR rankings into the top tier.

The impetus behind the Emerging University initiative can be traced to President David E. Daniel's effort to obtain legislative support for boosting The University of Texas at Dallas into the top tier rankings as a means to acquire more monetary resources for his institution (Dallas Morning News, 2009). To accomplish this task, Dr. Daniel wrote an executive summary titled "Thoughts on Creating More Tier One Universities in Texas" which outlined the benefits that more public top tier institutions could provide to the State of Texas, not the least of which is to stem the tide of Texas' "brain drain" as more high school graduates leave the state to attend college (Daniel, 2008). Dr. Daniel also argued that top tier research institutions provide economic stimulus through their research efforts, by providing jobs, and by producing well-educated and well-trained workers for local businesses. The state legislature responded by passing House Bill 51 to fund and support seven Texas public universities in their efforts to obtain top tier status (Texas Higher Education Coordinating Board, 2009).

The economic impact of a top tier institution on its host community is often the core argument behind university efforts to achieve higher rankings. Most USNWR metrics rely upon student quality, and high quality students are drawn to universities with prestigious reputations, reputations earned not only by the kind of students admitted but by the research conducted by their faculty. Well-educated graduates from prestigious institutions are desired by businesses seeking highly skilled employees. Universities themselves generate economic development by simply being present: they represent a large population of students and tax-paying employees who eat at local restaurants, shop at local stores and live in local housing. SUNY Buffalo is currently proposing to move its medical, dental, nursing, pharmacy and public health schools

into downtown Buffalo and expand its campuses not only to meet its aspirations of becoming a national leader in education and research but also to act as an economic catalyst for a host city that has experienced significant economic decline in the last few decades. Accomplishing this would require state legislative approval for tuition increases and public-private partnerships to pay for the expansions. (Kaplan, 2011)

For years, institutional research offices have provided policy analyses by benchmarking their institution against other institutions with similar characteristics or that have qualities that the institution aspires to obtain. Upper administrators then use these comparisons to establish policies that, for example, will improve graduation rates through better student selection or encourage more faculty research through targeted hiring. Benchmark metrics gathered by institutional research offices can enable university administrators to gain political support from political constituencies as well as the university community when proposing new policies.

For city administrators, having a top tier higher education institution located in their municipality can mean an increase in jobs, revenue and quality of life for their community. Universities can provide a municipality with a venue where public events can be held as well as educational opportunities for its citizens. In short a higher reputation for an institution can benefit its host municipality and both organizations can mutually benefit from a university's top tier ranking.

### **Purpose of Research**

What this research will attempt to address is the question: "Is there any relationship between top tier public universities and their host municipalities?" If there is a relationship

between the two entities it may provide university and city administrators information that can assist in obtaining funding, enable cooperation on joint projects and cut costs on certain operational tasks. For higher education institutions that are attempting to move up to top tier status, the findings may provide key insights that can enable institutions and their host municipalities to work together so that the institution can obtain top tier status.

The results of this research will be applied to seven “emerging” Texas public research universities as defined by the Texas state legislature with the hope of determining if the characteristics of host municipalities are predictive of the success of emerging public universities in Texas in attaining top tier status. Furthermore, it is hoped that this research might be able to provide suggestions for universities and municipalities on how best to concentrate efforts toward attaining improved conditions and greater synergy between the emerging research institution and the host municipality.

### **Hypothesis**

This research seeks to determine if cities under a certain population size will be more correlated to a top tier university, and thus more dependent upon that university as an economic driver, than a city with a much larger population or one with a more diverse economic portfolio (i.e. Burlington, Vermont as opposed to Seattle, Washington). The research also seeks to determine if smaller cities that demonstrate dependency on their higher education institutions are also more likely to have joint city-university programs than larger cities whose economies are more independent from their higher education institutions.

It is hoped that through this study the relationship between top tier institutions and municipalities will be explored to provide some insight on how two public organizations operate

and can have a symbiotic relationship that can benefit both entities. Cities that are considered a “college town” are more likely to be identified with the college or university that resides in their city limits (i.e. Blacksburg, Virginia and Virginia Tech) than cities that have an independently established identity (i.e. Los Angeles, California and University of California, Los Angeles). Can a relationship with the host municipality enable universities to move up in the USNWR rankings? Are there other benefits that can be obtained if both municipal and university administrators seek certain common goals? With the data obtained in this study it is hoped that areas of cooperation will be discovered which can assist administrators in both municipalities and higher education institutions in setting goals that are obtainable and realistic and which will propel a higher education institution upwards in the rankings.

## **Literature Review**

A review of scholastic work on universities and their relationship to municipalities demonstrates that there has not been a significant amount of research on the connection between city services, universities, and efforts to improve university standing in U.S. News and World Report rankings. Even the connection between universities and the use of municipal services has not received a great deal of attention beyond discussions of city complaints that universities are tax-exempt entities who impact service delivery. However, this does not mean that there has not been ample research on town-gown relations. There has been a significant amount of work demonstrating the historical ties (some as far back as the medieval era) between cities and universities (Barzun 1968, Mosher 1975, Bender 1988, McGirr, Kull, and Enns 2003). Much of the literature over the last twenty years tends to focus on the conflicts that emerge between cities

and universities regarding tax exemption, the need for payment in lieu of taxes (PILOT) or services in lieu of taxes (SILOT), and hostility from cities to university expansion plans (Healy 1995, Fischer 2010). Recently, these arguments have been used as a starting point for calls for closer cooperation between cities and universities so that they may mutually benefit each other (Kysiak 1986, Bender 1998, Maurrasse 2001, Freeland 2005, Sungu-Erylimaz 2009, O'Mara 2010). One of the most important and well-researched areas of town gown relations has been the focus on the universities' economic impact on municipalities and the surrounding region.

There is sufficient research showing how the university is a contributor to economic development, a key partner in neighborhood rejuvenation and a necessity for any city trying to adapt to the new knowledge based economy (Booth and Jarrett 1976, Watson 1995, Steinkamp 1998, Initiative for a Competitive Inner City 2002, Bok 2003, Hewlett 2004, Perry and Wiewel 2005, Fischer 2006, Rodin 2007, Aaron and Watson 2008, Baker-Minkel, Moody, and Kieser 2004, Mayer 2008, Trani and Holsworth 2010). Aside from the economic impact, some research has been dedicated to the nature of college towns as a unique type of city in modern America (Gumprecht 2003). Other researchers have explored the capacity for universities to be facilitators of citizen involvement in government affairs (Kathi, Cooper, and Meek 2007) and how the city officials can play a valuable role as educators in university classrooms (Milam 2003, Booker 2006). This brief survey of town gown relations in academic literature should not be mistaken for being absolute in scope or depth, but merely serve to designate the predominate trends in the literature and indicate what has been left unexplored. To the authors' knowledge there has been no systemic work looking at the full range of city services that a university may use or have agreements with municipalities for usage. There has not been a model developed that categorizes the size/scope of cities and their respective universities, looks at the various

agreements between cities and universities (services, easements, joint training). Finally, there has not been a discernable attempt in the literature to look at the potential relationship between city services and university growth.

Given that little research exists on the relationship between city services and universities, it should come as no surprise that there is no research that also includes the impact of U.S. News & World Report rankings on universities and their efforts to increase their position in the rankings. Academic research on the U.S. News and World Report rankings tends to focus on analyzing the quality of the rankings and, more often than not, making criticisms of the variables and formulas utilized to make the rankings (Lia 2001, Webster 2001, Pike 2004, Brooks 2005). Criticisms of the U.S. News and World Report rankings also focus on their potential to disadvantage predominantly black colleges (Kamara 2007) or to generate academic homogenization that is antithetical to the American university mission (Diver 2005). Aside from the accuracy of the rankings as a tool for evaluating the university, a decent portion of the research looks at the impact of the rankings on universities on student enrollment, university reputation or as a litmus test for university success (Monks and Ehrenberg 1999, Meredith 2004, Standifird 2005, Michael 2005 Bastedo and Bowman 2010). Despite the bevy of research on the U.S. News and World Report rankings, even when looking at how they can drive university goals and policy, there has not been any academic work looking at universities wishing to improve their rankings and the relationship to city services that the municipality offers. Given the lack of research on a potential connection between city services, universities and the need to achieve a higher ranking (such as tier one) from U.S. News and World Report, this paper proposes the following research project.

## **Methodology**

The methodology for this research is a mixed methodology using both qualitative and quantitative techniques in gathering the data as well as quantitative techniques in the analysis portion of the research. The study uses a cross sectional approach since the research uses data taken at one point in time for all observations and the research study has 100% of the cases (in this case ranked USNWR public higher education institutions and the seven emerging Texas institutions) for the researchers to collect data for each institution. For the qualitative methodology portion of the research archival documentation was used as well as interviews of both university and city administrators when documentation was unavailable (Webb, Campbell, Schwartz and Sechrest, 2000) (Leedy and Ormond, 2001).

The list of top tier public universities was extracted directly from the USNWR website for 2010 as well as the corresponding data that USNWR had collected for those universities. For other data census data and Geospatial Information was used to gather population, socio-economic and geographical characteristics of both universities and cities. The list for the Texas emerging universities was taken from the Texas Higher Education Coordinating Board website.

Certain metrics such as graduation and retention rates, faculty quality and research expenditures distinguish some public universities as some of the highest quality and most successful in the United States. Commonalities among top ranked higher education institutions will be identified in this study. The characteristics of the host municipalities for these top ranked institutions will then be analyzed for key patterns in such metrics as public transportation, form of city government, tax structure, demographics, and the local school district to name a few. This research collected data for 78 different variables in the areas of higher education institutional data, municipal data and geospatial information system (GIS) data. (See Appendix A for a complete list of the variables that was used in the research.)



Do host municipalities share certain characteristics that make them particularly agreeable to top public universities or does the presence of these universities affect the host municipality? If there is a correlation found between key metrics for top universities and their host municipalities, is there a causal relationship? This study will attempt to address those questions during the analysis phase of the project. The methodology of this research will then be applied to seven “emerging” Texas public research universities as defined by the Texas state legislature with the hope of determining if the characteristics of host municipalities are predictive of the success of emerging public universities in Texas in attaining top tier status.

The data that is collected will be from a variety of sources that are both qualitative and quantitative in nature. The sources will include published reports, information gathered online and interviews with university officials and city officials. Once the data is collected, it will be analyzed statistically to see if any correlation exists between the top tier institution and their host municipality. If there is a correlation found between key metrics for top universities and their host municipalities, is there a causal relationship?

### **Data Analysis**

To answer these research questions, data exploration will be performed initially through the application of frequency and descriptive statistics e.g. means, median, standard deviations where appropriate and graphically demonstrating a visual impression of the distribution of data using histograms.

According to the USNWR universities are classified into four main groupings: National Universities, National Liberal Arts Colleges, Regional Universities and Regional Colleges. The

researchers will compare different characteristics of the municipalities by these four main university categories. The USNWR further classifies schools in the Regional Universities and Regional Colleges into one of four geographic regions: North, South, Midwest, and West. We will thus explore whether there are any differentials by location. (For a complete list a variables see Appendix A.)

- a) Municipal Characteristics (i.e. budget, number of employees)
- b) Median income (Social economic status)
- c) Municipal budget - is there any allocation of this budget to the university
- d) Transport – access to an airport/rail etc
- e) Municipal facilities on university land/next to university land
- f) Violent crime rate
- g) Form of Government for the city
- h) Type of student housing
- i) Collaboration of municipalities with universities

To establish whether there are differences using each of the parameters above we will perform a Students' t-test for continuous variables comparing between two groups and an analysis of variance (ANOVA) for groups/categories with more than two groups e.g. total population. A Chi-square test of independence will then be used to assess associations between parameters that are categorical e.g. form of government for the city. We can further subdivide and classify universities into classes say 1-25 top universities, 26 – 50, 50 – 75, and bottom 25 universities for both national and regional universities. Using this approach we will assess for trends using a Chi-square test for trend.

The USNWR criteria for ranking are based on a number of parameters that focus the institutional performance in a variety of perspectives. There are various challenges inherent in the classification of universities i.e. what parameters best discriminates amongst academic institutions, how many parameters to include without over fitting and/or saturating the prognostic model used heterogeneity of universities ranging from subjects offered and also how to establish weights for the distinct parameters.

In order to establish which parameters of a municipality and weights are more appropriate for the determination of university ranking, we will apply a multivariate analysis of the characteristics and demographics of the municipalities upon which the universities reside. Using this approach, we should be able to identify which factors are largely responsible and contribute most to the ranking of universities. Statistical significance will be assessed at the 5% level of significance ( $p\text{-value} < 0.05$ ). All analysis was performed by SPSS for Windows, Chicago, SPSS Inc.

## **Results of Analysis**

### *Population of Study – (Appendix B)*

There were a total of 68 public top tier ranked universities that were used in the analysis for this research. The researchers categorized the university rankings of 2009 into classes of 10 i.e. 1 – 10 best universities, 11 – 20, 21 – 30, 31 – 40, 41 – 50, 51 – 60, 61 - 68 for ease of comparison and analysis. The researchers assessed for whether there are differences between university ranking and enrollment rates in Fall 2009.

### *Analysis of Enrollment at Public Top Tier Institutions*

The researchers assessed for differences in enrollment rates by university ranking (categorized into groups of 10) using an analysis of variance (ANOVA) and there was indeed a significant difference in enrollment rates by ranking with top ranked universities having higher enrollment rates,  $p\text{-value} = 0.008$  (Appendix B).

#### **Analysis of Enrollment of Top Tier Public Institutions**

<b>Rankings</b>	<b>Fall Enrollment</b>	<b>International</b>	<b>Out of State</b>	<b>Total</b>
<b>2009</b>	<b>Rates</b>	<b>Enrollment</b>	<b>Undergraduate</b>	
	<b>Rates</b>	<b>Rates</b>	<b>Enrollment</b>	
	Mean	Mean	Mean	
1 - 10	31,144.3	3,172.2	5,520.336	10
11 – 20	39,459	2,923.4	5,267.482	10
21-30	34,230.15	2,813.692	8,261.294	13
31-40	19,125.11	1,280.222	6,294.654	9
41-50	28,747	1,656.333	6,323.913	9
51-60	25,880.82	1,771.909	6,020.996	11
61-68	23,138.5	1,261.833	5,132.503	6
Total	29,491.09	2,220.956	6,262.766	68

**Table 8.1**

The researchers also assessed for trend across the ordered groups of university ranking by enrollment rates and this was also significant, trend  $p\text{-value} = 0.006$ . Similarly the researchers evaluated the university rankings by the number of international students enrolled. There were

significant differences by ranking categories using ANOVA,  $p$ -value = 0.008 and this trend was significant too across ordered groups,  $p$ -value = 0.001. There was no trend in the number of undergraduates enrolled out of state to university rankings, trend  $p$ -value = 0.92. Also, there was no significant difference in the mean number of out of state undergraduate enrollment by rankings,  $p$ -value = 0.77.

There was no association between universities which had hospitals ( $p$ -value = 0.08), grant medical degrees ( $p$ -value = 0.79) and had a component of university system ( $p$ -value = 0.29) with university rankings. There was an association between those universities that had a law school and the university rankings with majority of those in the top rankings were universities with a law school,  $p$ -value = 0.01. 9 of the top 10 best ranked universities have law schools and 8 of the best 11-20 also had law schools (17/20 of the best 20 universities had a law school). Also, according to Carnegie classification 2005, there was a significant association between the level of research undertaken by the universities and the rankings,  $p$ -value = 0.005. Not surprising that most universities in the top ranks were those that were involved in very high research activity. Of the number of universities that are involved in very high research, 31/52 (60%) universities are in the top 30 ranking compared to 21/52 (40%).

There was no association between Carnegie undergraduate instruction program ( $p$ -value = 0.30), Carnegie graduate instruction program ( $p$ -value = 0.30), Carnegie size and setting ( $p$ -value = 0.09), grant status ( $p$ -value = 0.08) and Carnegie classification 2000 ( $p$ -value = 0.17) with university rankings. There was an association between both Carnegie undergraduate profile and Carnegie enrollment profile with university rankings,  $p$ -value = 0.002 in both cases. Most universities that belong to the association of American universities were ranked highly as opposed to those who do not,  $p$ -value < 0.001.

### *Revenues – (Appendix B)*

There was a difference in total revenue for year 2009 with university rankings, total expenditures, research expenditures, endowment value at fiscal end year 2009 using an analysis of variance, ANOVA, p-value =  $<0.01$  and the test for trend across the ordered groups was significant too for all cases above. For example the total revenue reduced with decreasing university rankings i.e. highly ranked universities had the highest total revenues and vice versa. However there was no association with average alumni giving rates with university rankings, ANOVA p-value = 0.38 and trend test p-value = 0.29.

### *Employees – (Appendix B)*

There was a significant association of university rankings with length of tenure of university employees, number of graduate assistants, total number of Tenure/Tenure Track Faculty, total number of instructional and non-instructional employees and total campus community (p-value  $<0.05$ ).

### *Number of degrees awarded in 2009– (Appendix B)*

The number of Bachelor, Master's and Doctoral degrees awarded by universities was associated with their rankings using an ANOVA and test for trend. However, this association was not significant for first professional degree awarded in 2009 (p-value  $>0.05$ ).

### *University Setting/Location – (Appendix C)*

Universities setting i.e. whether they are located in an urban, suburban or rural setting had no bearing on subsequent rankings ( $p\text{-value}>0.05$ ). Similarly, geographic region (South East, South West, Far West, Mid East etc), degree of urbanization for those located in cities whether they were in large cities, medium or small cities had no association with their rankings ( $p\text{-value}>0.05$ ).

### *Population – (Appendix C)*

Population size was significantly associated with university rankings with highly ranked universities having high population sizes. This trend was significant across ordered categories of university ranks as well. The university ranking however, was not associated with median incomes, ability of the university to expand and whether the university was served by an airport or rail service. Therefore on these variables there was no correlation or linkage to their host municipalities.

### *Demographics – (Appendix C)*

The mean number of students by university rankings was significantly different with highly ranked universities having higher student numbers on average,  $p\text{-value} = 0.02$ . The demographic structure of universities in terms of the proportions of students by race (i.e. White, African-American or Hispanic) did not have any association with university rankings, ( $p\text{-value}>0.05$ ) apart from the population of Asian students which differed by university rankings with highly ranked universities having higher proportions of Asian students,  $p\text{-value} = 0.002$ .

The variable of demographics was not dependent on the terrain of where the university was located i.e. mountainous, coastal, plains etc.

*Characteristics of the Counties/Municipalities where the Universities are Located* – (Appendix C)

There was no link between the university rankings and whether they had a comprehensive master plan integrated with the local municipal where they are located, whether municipalities provided utilities or not, violent crime rates in 2009 in the municipality, having an economic development corporation, whether the university has a board of trustees or not and the form of Government for the city (p-value > 0.05).

Whether universities were providing housing to their staff or not – (Appendix B), were leasing land (Appendix D) or providing easement to the city had no association with their rankings – (Appendix D). Further, there was also no association with adopted general fund budget, total number of staff for city and the percentage of college educational (Appendix E).

Most universities, 57/59, had agreements with their respective municipalities and this was irrespective of their university rankings hence there was no association between whether municipalities had agreements with universities and their respective rankings, p-value = 0.84 (Appendix D). However this high percentage suggests that most top tier public universities and colleges do find this type of arrangement symbiotic for both organizations. The ranking of universities as an employer also had no association with their eventual university rankings, p-value = 0.21 (Appendix D).



Whether universities and municipalities had joint training or not did not seem to have an effect on the differences in their rankings, p-value = 0.48 (Appendix D). Similarly for universities and municipalities having joint facilities, p-value = 0.34, municipal and university economic development, p-value = 0.84 and municipalities deal with university regarding utility rates, p-value = 0.62 (Appendix D). However there was a significant association between university rankings and international town and gown associations, p-value = 0.003 (Appendix D).

#### *University Setting/Location*

Universities setting i.e. whether they are located in an urban, suburban or rural setting had no bearing on subsequent rankings (Appendix C). Similarly, geographic region (South East, South West, Far West, Mid East etc), degree of urbanization for those located in cities whether they were in large cities, medium or small cities had no association with their rankings (Appendix C).

#### *Population*

Population size was significantly associated with university rankings with highly ranked universities having high population sizes (Appendix E). This trend was significant across ordered categories of university ranks as well. The university ranking however, was not associated with median incomes, ability of the university to expand and whether the university was served by an airport or rail service (Appendix E). Therefore on these variables there was no correlation or linkage to their host municipalities.

## **Inter-cooperation between Higher Education Institutions and their Host Municipalities**

A look at the data shows several entities that do in fact have joint programs between the higher education institution and their host municipality (Table 8.2).

### **Joint Variables for Higher Education Institutions and Municipalities**

Characteristic	Yes (%)	No (%)
Comprehensive master plan integrated with university	46 (67.6)	22 (32.4)
Municipal agreements with universities	57 (96.6)	2 (3.4)
University and Municipal Joint Training	45 (86.5)	7 (13.5)
University and Municipal economic development	40 (78.4)	10 (21.6)
University town and gown association	15 (20)	60 (80)
University leasing land or granting easements to city	36 (59)	25 (41)

**Table 8.2**

The importance to a municipality of having a public top tier institution in their community can be seen in Table 8.3 where it ranks the higher education institutions as an employer in the community.

**Rank of University as an Employer in the Municipality**

Rank of university as an employer	Frequency	Percentage
1	38	62.3
2	6	9.84
3	3	4.92
4	4	6.56
5	3	4.92
7	2	3.28
8	2	3.28
23	1	1.64
25	1	1.64
31	1	1.64

**Table 8.3**

While it is not possible to perform statistical analysis on some of the qualitative data, the examples do provide insight into how higher education institutions and host municipalities can work together to improve both of their organizational environments or services. An example can be seen at the Miami University at Ohio and the City of Oxford hosting joint training exercises between the two organization’s police departments (City of Oxford, 2010). Such training arrangements benefits both organizations in how first responders can react to a situation and how both organizations can benefit from cost savings to having the police departments train at the same time. Cost savings and improvement in service can also be realized in both joint economic development efforts and mutually funded facilities which benefits the higher education institution as well as their host municipality. An example of these two types of activities can be seen with Ohio State University’s redevelopment of the City of Columbus’s heliport facility into a medical facility and the joint effort by both Columbus and Ohio State University to revitalize neighborhoods for economic development purposes (City of Columbus, 2010 and Ohio State University – Board of Regents, 1997). In Table 8.4 the majority of public top tier institutions have joint facilities with their host municipalities.

### **Facilities Jointly Owned by Universities and Municipalities**

University and Municipal Joint facilities	Frequency	Percentage
No	21	39.62
Yes	24	45.28
none	1	1.89
none listed	7	13.21

**Table 8.4**

The University of Maryland – College Park is another example of a university that is attempting to have better cooperation with their host municipality in redevelopment efforts (University of Maryland – Office of Sustainability, 2009). Utility rates are another area where municipalities and higher education institutions frequently attempt to negotiate a set rate to benefit the higher education institution (Table 8.5)

### **Top Tier Universities with Special Utility Rates from Host Municipality**

Municipal deal with university regarding utility rates	Frequency	Percentage
Not applicable (N/A)	9	16.36
No	34	61.82
Yes	12	21.82

**Table 8.5**

In addition many universities have mutual aid arrangements with their host municipality. The University of Massachusetts – Amherst has a mutual aid agreement with the Town of Amherst that calls for resources to be allocated accordingly in times of crisis (The University of Massachusetts – Amherst, 2011).

By benchmarking institutions that have these inter-cooperative arrangements, a best practices approach can be formulated where such arrangements can be implemented within the constraints of available resources and political realities will allow for such cooperation.

Certainly these practices can provide ideas on beneficial arrangements to other institutions that are aspiring to become a top tier institution along with their host municipalities. These arrangements can provide improved services, cost savings and organizational effectiveness to both higher education institutions and host municipalities. For higher education institutions that are seeking to become top tier institutions, cooperation with their host municipality would appear to benefit both organizations in terms of effectiveness of operations, cost savings and the ability to offer services to a broader community.

### **Recommendations**

Higher education institutions that are seeking to become a top tier institution should consider how their organization currently operates with their host municipalities. Most of the public top tier institutions have agreements or arrangements with their host municipalities which can improve operating efficiencies and cost savings. In addition through jointly constructed facilities, for example, both organizations can share in the cost of construction, obtain funds from different sources and have jointly shared maintenance and operation expenses/duties that can potentially reduce costs. Higher education institutions and municipalities should look at their own benchmarked organizations to see what projects could be successfully implemented.

### **Conclusion**

In conclusion the research has shown that there is a correlation between public top tier universities and their host municipalities. Even though there are varying degrees of interaction between cities and higher education institutions, it is apparent from the data gathered and analyzed in this research that cooperation does exist for both organizations and that with cost cutting efforts that this will lead to even more mutual arrangements for operations, infrastructure

and facilities. In the age of tightening budgets and the political push for higher education institutions to attain “top tier status”, college and university administrators should look closely on their current business practices and relationships with their host municipality and attempt to create more cooperation where business operations would prove to be practical.

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## Appendix A – Variables Used in Study

### **University Variables**

- 1) Institution Name
- 2) Fall 2009 Total Enrollment
- 3) International Students Enrolled
- 4) Percent International
- 5) Percent of Undergraduates Out of State
- 6) University has Hospital
- 7) Grants Medical Degrees
- 8) University Law School
- 9) Component of University System
- 10) System Name
- 11) Carnegie Classification 2005 Basic
- 12) Carnegie Undergraduate Instructional Program
- 13) Carnegie Graduate Instructional Program
- 14) Carnegie Undergraduate Profile
- 15) Carnegie Enrollment Profile
- 16) Carnegie Size and Setting
- 17) Carnegie Classification 2000
- 18) Grant Status
- 19) Association of American Universities
- 20) NCAA Division
- 21) Total Revenues FY2009
- 22) Total Expenditures FY2009
- 23) Research Expenditures FY2009
- 24) Endowment Value at Fiscal Year End 2009
- 25) Average Alumni Giving Rate
- 26) Tenure/ On-Track Faculty
- 27) Graduate Assistants
- 28) Total Instructional Employees
- 29) Total Non-Instructional Employees
- 30) Total Campus Community
- 31) % Student – Calculated Variable
- 32) % Instructional – Calculated Variable
- 33) % Staff – Calculated Variable
- 34) Bachelor's Degrees Awarded (AY09)
- 35) Master's Degrees Awarded (AY09)
- 36) Doctoral Degrees Awarded (AY09)
- 37) First Professional Degrees Awarded (AY09)
- 38) Board of Trustees
- 39) Type Student Housing
- 40) Faculty/ Staff Housing

### **Geospatial Information System (GIS) Variables**

- 1) State
- 2) City
- 3) University Setting
- 4) Degree of Urbanization
- 5) Geographic Region
- 6) Population

- 7) Population Density per State
- 8) Medium Income
- 9) Expansion Ability for University
- 10) Airport
- 11) Rail
- 12) Demographics Caucasian/African-American/ Hispanic/Asian
- 13) Type of Terrain
- 14) Density per Square Mile
- 15) Acres
- 16) Square foot per student – Calculated Variable
- 17) Sq Feet Campus
- 18) Sq Miles Campus

### **Joint Variables for Higher Education Institutions and Municipalities**

- 1) Comprehensive Master Plan Integrated with Municipal
- 2) Municipal Agreements with Universities
- 3) Rank of University as an employer
- 4) University and Municipal Joint Training
- 5) University and Municipal Joint Facilities
- 6) University and Municipal Economic Development
- 7) Municipal Deal with University with Regards to Utility Rates
- 8) University Advertised on City Website
- 9) International Town and Gown Association
- 10) University leasing land or granting easements to city

### **Municipality Variables**

- 1) Provide Utilities
- 2) Transportation in Municipality
- 3) Violent Crime Rate 2009
- 4) Form of Government for city
- 5) Economic Development Corporation or Department
- 6) State Income Tax
- 7) State Sales Tax
- 8) Adopted General Fund Budget
- 9) Educational attainment of Residents
- 10) Yearly Budget for School District

## Appendix B – Statistical ANOVA Tests on Variables for University

* Statistical significance was assessed at the 5% level of significance (p-value < 0.05)	
University Variables	P-value
1) Fall 2009 Total Enrollment	0.008
2) Percent International Students Enrolled	0.008
3) Percent of Undergraduates Out of State	0.77
4) University has Hospital	0.08
5) Grants Medical Degrees	0.79
6) University Law School	0.01
7) Component of University System	0.29
8) Carnegie Classification 2005	0.005
9) Carnegie Undergraduate Instructional Program	0.30
10) Carnegie Graduate Instructional Program	0.30
11) Carnegie Undergraduate Profile	0.002
12) Carnegie Enrollment Profile	0.002
13) Carnegie Size and Setting	0.09
14) Carnegie Classification 2000	0.17
15) Grant Status	0.08
16) Association of American Universities	<0.001
17) NCAA Division	>0.05
18) Total Revenues FY2009	<0.01
19) Total Expenditures FY2009	<0.01
20) Research Expenditures FY2009	<0.01
21) Endowment Value at Fiscal Year End 2009	<0.01
22) Average Alumni Giving Rate	0.38
23) Tenure/ On-Track Faculty	<0.05
24) Graduate Assistants	<0.05
25) Total Instructional Employees	<0.05
26) Total Non-Instructional Employees	<0.05

27) Total Campus Community	<0.05
28) Bachelor's Degrees Awarded (AY09)	<0.05
29) Master's Degrees Awarded (AY09)	<0.05
30) Doctoral Degrees Awarded (AY09)	<0.05
31) First Professional Degrees Awarded (AY09)	>0.05
32) Board of Trustees	0.59
33) Type Student Housing	> 0.05
34) Faculty/ Staff Housing	0.34

## Appendix C – Statistical ANOVA Tests on Variables – GIS

<b>Geospatial Information System (GIS) Variables -*</b> Statistical significance was assessed at the 5% level of significance (p-value < 0.05)	<b>P-value</b>
1) State	NA
2) City	NA
3) University Setting	>0.05
4) Degree of Urbanization	>0.05
5) Geographic Region	>0.05
6) Population	0.02
7) Population Density per State	>0.05
8) Medium Income	>0.05
9) Expansion Ability for University	> 0.05
10) Airport	> 0.05
11) Rail	> 0.05
12) Demographics: Caucasian	>0.05
African-American	>0.05
Hispanic	>0.05
Asian	0.002
13) Type of Terrain	>0.05
14) Density per Square Mile	>0.05
15) Acres	> 0.05
16) Square foot per student – Calculated Variable	> 0.05
17) Sq Feet Campus	> 0.05
18) Sq Miles Campus	> 0.05

## Appendix D – Statistical ANOVA Tests on Joint Variables – Higher Education Institutions and Municipalities

Joint Variables for Higher Education Institutions and Municipalities --* Statistical significance was assessed at the 5% level of significance (p-value < 0.05)	P-value
1) Comprehensive Master Plan Integrated with Municipal	> 0.05
2) Municipal Agreements with Universities	0.84
3) Rank of University as an employer	0.21
4) University and Municipal Joint Training	0.48
5) University and Municipal Joint Facilities	0.34
6) University and Municipal Economic Development	0.84
7) Municipal Deal with University with Regards to Utility Rates	0.62
8) International Town and Gow n Association	0.003
9) University leasing land or granting easements to city	> 0.05



## Appendix E – Statistical ANOVA Tests Variables –Municipalities

Municipality Variables - -* Statistical significance was assessed at the 5% level of significance (p-value < 0.05)	P-value
1) Provide Utilities	> 0.05
2) Transportation in Municipality	> 0.05
3) Violent Crime Rate 2009	> 0.05
4) Form of Government for city	> 0.05
5) Economic Development Corporation or Department	> 0.05
6) State Income Tax	> 0.05
7) State Sales Tax	> 0.05
8) Adopted General Fund Budget	> 0.05
9) Educational attainment of Residents	> 0.05
10) Yearly Budget for School District	NA