

Economic Impact of Tarleton State University - Stephenville

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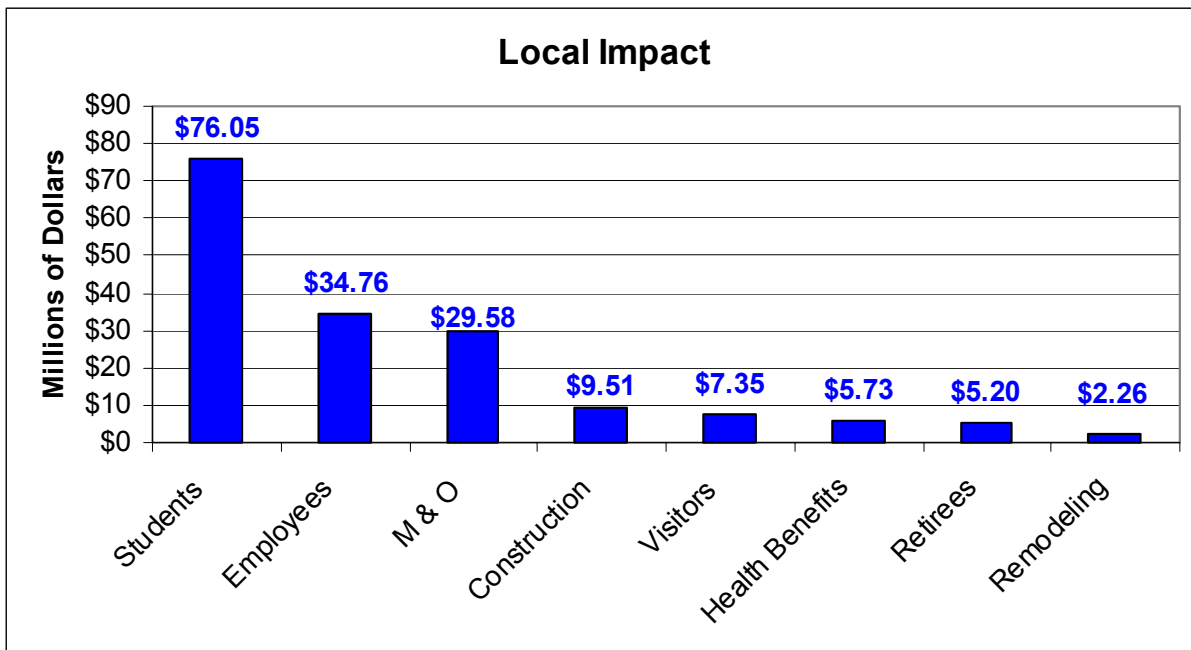
Economic Impact of Tarleton State University-Stephenville: A Summary

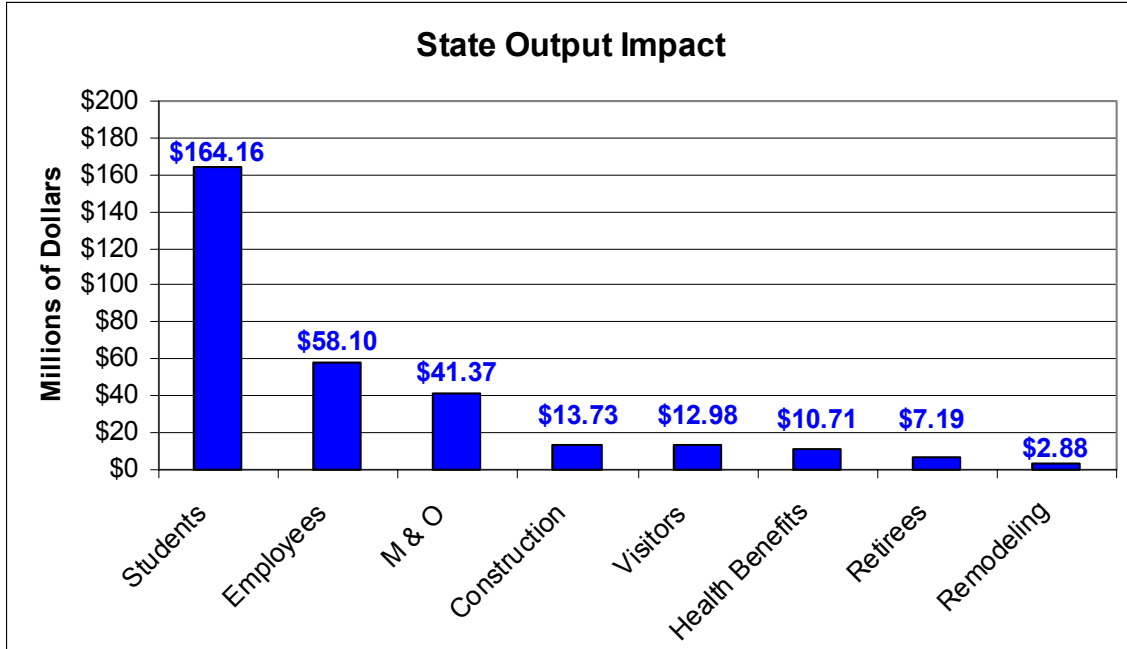
S. Hussain Ali Jafri

Tarleton State University-Stephenville is the single largest employer in Erath County and one of the largest employers in the region. To estimate the economic significance of Tarleton, this study measures the tangible benefits of the university at the county and state levels for the 2003-04 year. All direct expenditures were estimated through the use of surveys and university records. University expenditures were derived from accounting data obtained from the university. Faculty and staff expenditures represent the total salaries paid by the university following adjustments for payroll and social-security taxes. Students' expenditures were derived from a survey, which represented their typical expenditures over the month that was annualized over the year. Retirees' expenditures were estimated from a survey sent to all the retirees living in Texas. Visitors' expenditures were derived from the visitor's section of the student and faculty/staff surveys, and the visitor survey of all university departments and programs. This framework yields direct expenditures for each category of university related expenditures. These direct impacts are then processed through an input/output model.

All direct expenditures were adjusted for "leakages" at the county and state levels. A "leakage" identifies the portion of direct expenditures that leave an impact area and have no further effect within that area. Since the state level covers a larger economic area than the county level a greater portion of direct expenditures are captured, resulting in less leakage at the state level. The total direct adjusted expenditures at the county and state levels were estimated at \$113 M and \$155 M, respectively.

A standard input/output model (IMPLAN) was used to calculate the indirect impacts and multiplier effects. For example, a multiplier of 1.33 indicates that for every dollar spent (direct expenditure) an additional \$0.33 (indirect) is generated within the economy. The calculations yielded conservative overall multipliers of **1.50** at the local level and **2.01** at the state level. By summing the direct and indirect impacts the model estimated the total impact by each category and of the entire university. The total impacts at the county and state levels were **\$170 million** and **\$311million** respectively.





The model also calculated the number of new jobs generated by university related expenditures. The employment impacts for the county and state levels are given below.

University Employment	840
Added Employment (Erath County)	<u>2575</u>
Total Employment provided (Erath County)	3415
Added Employment (State of Texas)	<u>3166</u>
Total Employment provided (State of Texas)	4006

Conclusions:

- The tangible benefits in 2003-04 were impressive; Tarleton had an economic impact of **\$170M** and created **2,575** jobs within Erath County, and had an economic impact of **\$311M** and created **3,166** new jobs within the State of Texas.
- The value added to a graduate's life by enhancing his/her productivity and philanthropy, and the enrichment offered to the local community due to the presence of Tarleton, are intangible and immeasurable benefits to society and should be considered in the overall impact.
- With state appropriations approximating **\$32 M** and total output of **\$311 M**, taxpayers are receiving almost ten times their investment in tangible benefits alone.

For questions or clarifications, contact Dr. S. Hussain Ali Jafri, Professor of Economics, Department of Accounting, Finance and Economics, P.O. Box T-0920, Stephenville, Texas 76402, (254)-968-9633 or e-mail to jafri@tarleton.edu

Economic Impact of Tarleton State University-Stephenville

I. Introduction

The primary focus of the study is to estimate the university's impact on Erath County and the state of Texas. The study will be confined to events and activities of the university's Stephenville campus. This research project is an attempt to update and improve upon the previous economic impact study of Tarleton State University of 1999 - 2000. The growth and expansion of the Stephenville campus made it necessary to reaffirm and validate the economic impact of the university on the local economy.

At the outset, it is imperative to recognize that this study seeks to quantify only the short run impact that the university has on the local impact area. No attempt is made to calculate long-term effects of the university such as the increased productivity of the area workforce, the increased earning potential of graduates and power of the university to attract businesses and resources into the area. The measurement of these effects is beyond the scope of this study.

The project would not have been possible without the support and cooperation of the numerous campus offices and personnel that assisted in the gathering of needed data.

Tarleton State University and the Economic Impact Area

The main campus of Tarleton State University (TSU) is located approximately 65 miles southwest of the Dallas-Fort Worth metroplex in the city of Stephenville, within Erath County. Considered a regional public institution, the university provides educational opportunities to students from all over the state of Texas and the world. Currently, 215 Texas counties, 32 states and 25 foreign countries are represented in the

TSU student body of more than 7000 for the 2003-04 year. Tarleton's Stephenville campus has grown to employ 840 workers, making it the single largest employer in Erath County.

The University was founded in 1899 as John Tarleton Agricultural College as a private preparatory school. In 1917, the University joined the state's Agricultural and Mechanical College system, now known as the Texas A&M system. The college was granted junior college status in 1926. The Texas legislature changed the college's name to Tarleton State College in 1949. In 1959, Tarleton State College became a four-year degree institution. An act passed by the Texas legislature in 1973 officially changed the college's name to Tarleton State University.

Since its beginning, TSU has continued to be in a state of evolution, changing to meet the growing needs of its student body and the state of Texas. Consequently, the university now offers 128 undergraduate and 22 graduate programs, along with a cooperative doctoral program in educational leadership. In an effort to accommodate these changes and growth, Tarleton State University has added additional locations in Fort Worth (Terrell College of Clinical technology) and Granbury (Dora Lee Langdon Cultural and Educational Center). In 1999, Tarleton State University acquired the Tarleton University System Center—Central Texas (Tarleton-CT) in Killeen, Texas, approximately 100 miles south of the Stephenville campus. The Tarleton-CT University center allows TSU to provide educational opportunities to a greatly expanded geographic area of central Texas. Tarleton—CT was given the responsibility for the programs that had been previously established at Fort Hood to serve the soldiers stationed on the U.S.'s largest military base.

Main Questions:

This study examines the economic impact that Tarleton State University – Stephenville campus has on the local economy (Erath County) and the state of Texas. The study examines the impact the university, its employees, student body, visitors, and the retirees have on the local and state economies. How much additional income and output is generated in the local economy as a result of the university’s presence? How many additional jobs (which add additional income and wages) can be attributed to the university’s presence? Another way to look at the impact of the university is to determine what the local economy would lose in terms of jobs and revenue if the university were to close down? This study attempts to measure the direct, indirect and induced (defined later in the report) impacts of the university.

The report is arranged as follows. The next section looks at the local operating environment of the University, including the city of Stephenville and Erath County. The subsequent section presents a review of literature, which includes results and procedures from economic impact studies conducted by other public and private universities. In the following section, an overview of the main contributors to the economic impact, which includes the employees, students, visitors, and retirees along with university expenditures on maintenance and operations, new construction, and remodeling and renovations, is presented. This is followed by a description of the methodology and calculation method used in the determination of the multipliers. The final section includes a description of the findings, their implications and the conclusions of the study.

Erath County and Stephenville

Erath County has an area of 1,086 square miles and is surrounded by Comanche, Eastland, Hood, Somervell, Palo-Pinto, Bosque, and Hamilton counties. The county saw considerable population growth of 17.9% in the period 1990 – 2000. According to the U.S. Census Bureau, Erath County's population was 33,111 in 2003. The county has a well-diversified economy with major establishments in the manufacturing, retail trade, healthcare, food service and agricultural industries. Agriculture is the leading contributor to the area's economy providing approximately \$200 million annually [TED]. In particular, the \$140 million dairy industry makes Erath county the state's largest dairy producer.

According to the Business and Industry Data Center for the state of Texas, unemployment in Erath was only 2.6% in July 2004, well below the state average of 5.7% [TWC] and national average of 5.4%. The county also boasts a well-educated population with 77.1% having a high school diploma and 25% with a bachelor's degree or higher [BIDC]. The average weekly wage for the county was \$489, 35% below the statewide average of \$754 [BIDC].

Stephenville, Erath's county seat, has a population of 14,921, making up almost half of the county's population. Stephenville is important to the regional economy acting as the retail and medical center for some 80,000-area residents including those of the 7 surrounding counties within a 30-mile radius [TED]. In 1993, the city was named one of the top 100 best small towns in America in a book compiled by Norman Crampton [Community Profile]. Stephenville is home to three Fortune 500 companies employing 1400 people [TED].

II. Review of Literature

The total economic impact of a university is hard to measure. It may be measured from a short-term or a long-term perspective and calculated in regards to tangible or intangible benefits to the local economy, state, or any defined study area. The long-term benefits measure the impact of universities on the nation's stock of human capital and its consequences on economic development through an enhancement of the productivity of workers and the development of new technologies. The intangibles include the private and social benefits (externalities) of education, such as the refinement of the population, improvement in the quality of life of a community, and the enjoyment and appreciation of the arts. The long run, as well as intangible benefits, although real, are harder to quantify than tangible benefits.

Most studies have focused on measuring the impact educational institutions have on short-term, tangible benefits. The positive impacts of a university exposed through economic impact studies can potentially improve communication (public relations) between a university and the local community (town and gown), enhance the university's bargaining position with local city officials and utility companies with respect to services provided to the university, and ultimately improve prospects for additional private/public assistance to the university. For state-supported institutions such as Tarleton State University, economic impact studies have other uses as well. Since these institutions pay no property or sales taxes there are perceived "losses" of revenues for the local and state governments. In addition, state universities also receive government subsidies in the form of grants and other financial assistance. The results of an economic impact study can be used by a university to effectively justify the use (or the

loss) of taxpayers' monies. A selection of previous studies was reviewed for the preparation of this study and is presented here for illustrative purposes.

John Caffrey and Herbert Isaacs' "Estimating the Impact of a College or University on the Local Economy" is considered to be the classic of economic impact study models. Caffrey and Isaacs emphasized the importance of a properly defined impact area. Without a properly defined study area, complications in data gathering and interpreting the impact will arise. Their models were designed to quantify the impact on three groups within the local economy: local businesses, local government and local individuals. The authors also limited the models for use in measuring short-term economic impact and not for making long-term predictions. The downside to the models designed by Caffrey and Isaacs is the extensive amounts of data that is needed for the numerous equations.

Caffrey and Isaacs' models use multipliers. Multipliers are numbers that capture the size of the secondary (indirect) effects in an impact area. A multiplier in effect quantifies the ripple effect of a dollar spent in the impact area as it is spent and re-spent until it trickles out of the defined impact area. Defining an impact area can have a large impact on the multiplier that is calculated. The size of the impact area, the diversity of industries there, the dependence on outside sources for goods and services, and the rural / urban characteristics of the area all have an effect on the resulting multipliers for an area. An important point that Caffrey and Isaacs recognized was that multipliers can vary from location to location and can also vary over time for a single location due to changes in the basic structure of the economy.

Another study (Weisbrod and Weisbrod) focused primarily on the economic impact of a university. This study discusses important hurdles to economic impact research. The authors define economic impacts as “effects on the level of economic activity in a given area” and offer five alternatives to measurement (total employment, aggregate personal income, value added, business output, and property values) of the impact. The best measurement alternative will be dependent on the purpose of the study. One of the major issues they discuss is the importance of properly defining the study area as this alone can dramatically change the results of the study.

Other literature reviewed included a study titled “The Economic Impact of University Research” in which the authors discuss the shortcomings of the traditional input-output models in measuring the true impact of university research. The article relates university research impact to an iceberg, with traditional economic impact models measuring only the tip of the iceberg, which is easily seen. The authors discuss the development of new economic models, known as the New Growth theory, which do a better job of measuring the long-term dynamic impacts of university research on the economy, which are left out by traditional models.

Some studies concentrated on measuring the effects of an entire university system (such as the Texas A&M University system) or at the state level only (Colorado University, University of Massachusetts), while others examined the impacts on a more regional basis (Southern Illinois University and University of Waterloo). The University of Colorado study focused on the demand-side effects of its 22,000 employees and \$1.2 billion budget at the state level. The study applied an employment multiplier of 1.8, which was an average of the multipliers for its four campuses. The study used a

multiplier of 1.9 to surmise that the \$1.2 billion of Colorado University expenditures translated into over \$2.2 billion in incremental gross state product.

Also reviewing the impact of their university at the state level were Barry Field and Selene Weber of the University of Massachusetts (1996). The University of Massachusetts study encompassed the total effect of its five branches with a combined annual budget in 1995 of \$1.5 billion on the economy of Massachusetts. Using IMPLAN input-output models, Field and Weber concluded every dollar of additional support would produce an economic impact equal to \$2.40, equivalent to an output multiplier of 2.4. This study appears to have been done in order to provide the university with a bargaining tool to win additional support from the state government. Fields and Weber also computed an employment multiplier of 1.98 for the university.

On a regional basis, Beck et al. (1993) used the IMPLAN model in their study of Southern Illinois University. In their study Beck et al. examined the impact of the university's two colleges SIU-Carbondale and SIU-Edwardsville in the impacted area surrounding them, 19 counties for SIU-Carbondale and 14 counties for SIU-Edwardsville. The study then looked at the combined impact of both SIU colleges on the 36 counties comprising southern Illinois. An implied multiplier of 2.00 was derived for the total impact of SIU. Individually, SIU-Carbondale had a multiplier of 1.78 while SUI-Edwardsville was at 1.75. The increased multiplier may be related to the increase in covered impact area. Beck et al. claimed that this type of study is not truly an economic impact study but rather a demonstration of the impact that SIU has on the cash flows of the Illinois economy.

The University of Waterloo (UW) in Canada engaged Price-Waterhouse Coopers (PWC) to conduct a study on the impact that the university had on the regional economy. PWC then hired an expert to conduct the impact analysis. The analysis was completed using an econometric model based on the Statistics Canada Interprovincial Input Output Tables. It was determined that UW had a value added multiplier of .84, within the Waterloo Region that jumped to 1.46 when considering the impact to the entire province. Employment multipliers for the Waterloo region and province were determined to be 1.34 and 1.65, respectively. Setting this study apart from the others was the focus placed on the university's research activities. The study even quantified the indirect impacts of the university's research. This included the impact from new business partnerships and new businesses that were started, at least in part due to the university research. The study even went as far as determining multipliers for university alumni and for businesses that were created as a result of university research.

The studies that were reviewed that had a more local focus included that of Texas A&M University-Corpus Christi, Sam Houston State University, a previous Tarleton State University study and one from Virginia Commonwealth University that offered a different approach to economic impact research.

In 1998, Texas A&M University-Corpus Christi published an update to its previous 1995 economic impact study after it had experienced considerable growth in enrollment of 17%. The updated report was produced by simply inserting 1998 values into the 1995 analysis.

Table 1: Summary of Multipliers from the Sample of Reviewed Economic Impact Studies

Source	Multiplier Estimate
State-wide studies	
University of Colorado	
- Total Output	1.90
- Employment	1.80
University of Massachusetts	
- Total Output	2.40
- Employment	1.98
Regional Level Studies	
Southern Illinois University	
- Total Output (36 county region)	2.00
- Total Output (SIU-Carbondale 19 county region)	1.78
- Total Output (SIU-Edwardsville 14 county region)	1.75
University of Waterloo	
- Value Added multiplier (region only)	0.84
- Value Added multiplier (entire province)	1.46
- Employment (region only)	1.34
- Employment (entire province)	1.65
Local Level Studies	
Texas A&M – Corpus Christi	
- Total Output	2.75
- Construction	1.93
Sam Houston State University	
- Total Output	1.70
Tarleton State University -	
- Total Output (Beaty et al, 1995)	1.47*
-Total Output (Jafri et al, 2000)	1.48
-Total Output (State level)	1.70

* Supplied by the State Comptrollers' Office

The 1998 update took on a much smaller scale, focusing on the short-term impact of the university. No attempt was made to measure any long-term impacts, which they considered to be more important than the short-term impact, due the sheer difficulty of measuring those variables, such as higher worker productivity and higher earning potential for graduates. TAMU-CC used multipliers from the results of another Texas A&M University professor's unpublished study, which had been developed using the IMPLAN model. A multiplier of 2.75 was assigned to university operating expenses, additional faculty income, student expenditures, and Federal Student Assistance, while construction expenses were assigned a multiplier of 1.93.

The economic impact study of Sam Houston State University was also reviewed. Applying an arbitrary multiplier of 1.7 for all expenditure types, university, faculty/staff, students and visitors, the study determined that the university has an impact of nearly \$99 million on the surrounding area.

Beaty et. al (1995) estimated the impact of Tarleton State University to be \$92.7 million using a multiplier of 1.47, supplied by the State Comptroller's Office. Jafri et. al (2000) repeated the impact study of Tarleton but unlike Beaty et.al study, sought to provide a more detailed analysis of the economic impact. They examined new dimensions of economic impact including visitors, new construction, and retirees' impacts. The study rather than relying on a secondary source for multipliers calculated them using the IMPLAN model. Instead of using a common multiplier for all sectors of the university, a unique multiplier was derived from the model for each specific sector. The local output multipliers ranged from 1.17 for new construction expenditures to 1.66 for visitors' expenditures. According to Jafri et. al (2000), Tarleton with an average local

impact multiplier of 1.48, had an estimated \$157.1 million impact at the local level.

Tarleton's impact at the state level was estimated to be \$223.13 million with an average multiplier of 1.70.

One study that offered an alternative approach to measuring economic impact is that of Virginia Commonwealth University. The study modeled after the classic Caffrey and Isaacs' models made one significant change, however, and decided not to use multipliers. Instead it reported the direct spending of the university, staff, students, and visitors. They claimed that the use of multipliers created 'suspect' results. They also stated the difficulty of estimating accurate reliable multipliers as reason for not using them.

Our study combines the elements of the previous studies by examining the impact of a single campus at the local, as well as the state level.

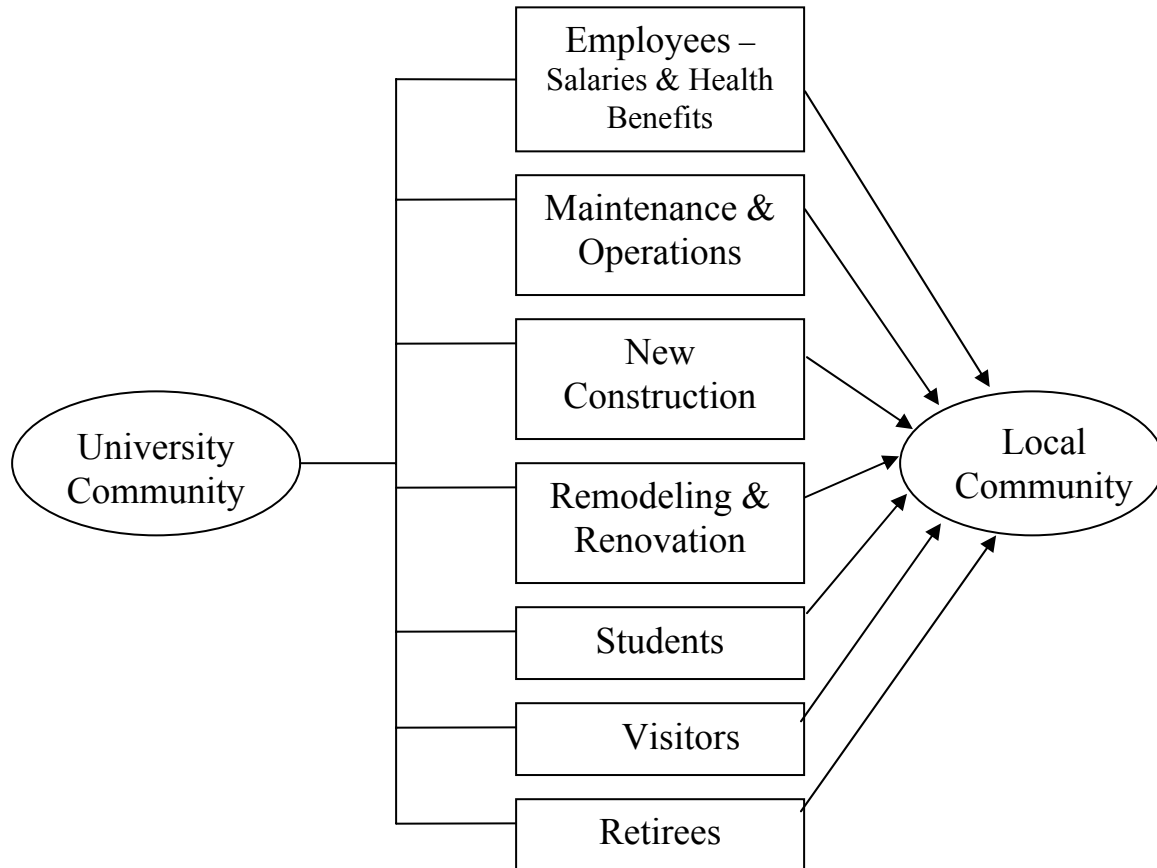
III. Research Design

The basic framework of this study is built around a conceptual model (see Figure 1) that isolates the university and the local economy into two separate entities. These two entities are referred to as the "university community" and the "local community." The following section defines the sectors of the university community that have both direct and indirect effects upon the local community.

The direct university expenditures include expenses allocated to maintenance and operation (M & O), remodeling and renovation, and new construction. In addition, the university community includes salaries paid to employees, student expenditures, visitors' expenses and finally expenditures of university retirees.

Expenditures for M & O include expenses on supplies, utilities, insurance, equipment, consulting fees, etc. Expenditures for remodeling/renovation (of existing structures) reflect an average amount spent in the last ten years.

Figure 1: Conceptual Framework for the Study



The university had several new multi-million dollar construction projects in the last ten years. In the last decade, the university added a new science building, student development center, residence halls and apartments and a complete revamping of the old Science building, which when completed, will be the new home of the Mathematics and Computer Science department. The yearly average of all these expenditures is

representative of the construction activities on the campus. The university has also received approval to build a new multi-million dollar Student Recreational Center.

The "employees" category refers to salaries of all employees (faculty, staff and administrators) including wages paid to adjunct/part-time employees. The Office of Human Resources provided us a detailed list of the salaries of all the employees. From this database, we sorted employees according to their campus affiliation – Stephenville and Killeen. From the Stephenville subgroup, we further classified the employees as either commuters or residents by checking the place of residence. For our purposes, we define commuters as those whose addresses (zip codes) indicate that they lived outside the county; the remaining were treated as residents. The salary figures exclude compensation to graduate assistants and student workers. This exclusion was needed to avoid double counting as student (both graduate and undergraduate) expenditures are computed as a separate unit in the study.

The visitors' category reflects the economic impact of those who visit the county due to the presence of Tarleton State University. This category is subdivided into visitors attending programs and events organized by different departments on the campus, as well as visitors to students and employees. Departmental visitors were identified through the administration of surveys sent to all the departments and programs on the campus. From the completed surveys, information for each event was derived with respect to the number of visitors, where they came from, how long they stayed their expenditures on meals, lodging, gasoline and shopping.

Data pertaining to visitors of Tarleton employees was obtained from the faculty/staff questionnaire, which included questions about the average number of visitors, their

length of stay, and their daily expenditures. From the sample of completed surveys, we extrapolated the data to the faculty/staff population only to the resident component of the total employees. Visitors at the local level were defined as those who were visiting resident employees. At the state level, we exclude all visitors as we assumed that they were coming from in state. The same approach/logic was also applied to student visitors.

Student expenditure data was gathered through a sample survey of the student population. The questionnaire besides attempting to estimate the expenditure patterns also included questions, which helped us to classify them as commuters or residents. The completed surveys revealed distinct spending patterns by the different groups of students (freshmen, sophomores, juniors, seniors and graduate students). From the completed surveys, we extrapolated the expenditure data for each distinct group multiplied by their corresponding enrollment in the fall/spring semesters and summer sessions. The data further classified student expenditures at the county and state levels.

The study also includes the economic impact of Tarleton State University retirees at the local and state levels. Retirees were mailed a questionnaire that was designed to obtain their average annual income and expenditures at both the county and the state levels. From the completed surveys, we extrapolated the income and expenditure data to the entire retiree population at the county and the state levels.

IV. Description of the Data

In this section, we will describe to some length, the data and the processes that were adopted to estimate the direct or immediate effects of the various segments of the University (refer Figure 1 – Conceptual Framework).

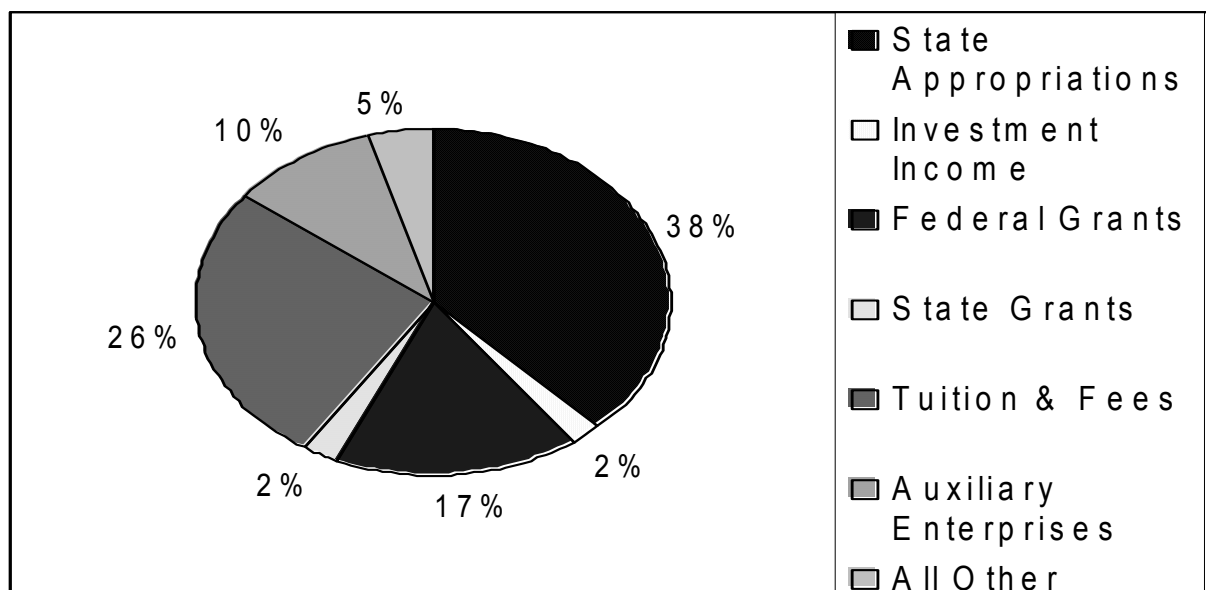
(A) - Direct Impact of the University Expenditures

University expenditures are divided into the following categories: Maintenance and Operation (M & O), Employees, New Construction, and Remodeling /Renovation. However, before looking at how the university spends its money we will first identify the sources of the university's revenues.

Sources of Revenues

For the 2003-04 academic year, the total revenues for the university amounted to \$87.4 million. By far the largest source of revenues was from state appropriations, (\$33.11 million), followed by tuition and fees (\$23.11 million). Federal grants provided another \$14.76 million.

Figure 2: Sources of Revenue



Auxiliary enterprises (student housing, athletics, parking) and investment income contributed \$10.5 million while additional state grants and other sources account for the remaining \$5.97 million generated by the university. A representation of all sources of revenues is given in Figure 2.

(B) Maintenance and Operation

According to the expense report data provided by the administration, maintenance and operations (M&O) expenses for the university totaled \$22.6 million for the 2003-2004 fiscal year. A \$681,000 downward adjustment was required to exclude the M&O expenditures associated with the Killeen campus leaving \$21.9 million of M&O expense for the Stephenville campus. The data provided indicated that an additional \$375,000 downward adjustment was needed to be made to correct for statistical discrepancies in the data. This leaves a total adjusted M&O for the Stephenville campus of \$21.5 million. The distribution of M&O expenditures is given below in Table 2 below.

Table 2: University Maintenance and Operation Expenses

Cost of Goods Sold	\$63,554
Professional Services	\$8,061,347
Travel	\$992,433
Materials & Supplies	\$6,397,634
Communication & Utilities	\$3,805,479
Repairs & Maintenance	\$477,850
Rentals & Leases	\$898,321
Printing & Reproduction	\$483,928
Other Operating Expenses	\$1,407,203
Interest	\$1,427
Subtotal	\$22,589,176
Killeen M & O Adjustment	(\$680,771)
Subtotal	\$21,906,978
M & O Adjustments	(\$374,996)
Total Adjusted M & O	\$21,531,982

(C) Employees

A survey was distributed to all full-time employees of the Stephenville campus to determine the size, distribution and location of their expenditures. The survey included questions on monthly household income, utility payments, mortgage/rent payments, automobile installments, as well as annual property taxes paid, etc (see Appendix A for a copy of the survey). Through a series of mailings (campus and e-mails), 725 surveys were distributed to the full-time employees. Of the 725 mailings, 48 were mailed to individuals who had spouses that are currently employed at the university; in these instances only one spouse was asked to respond. Therefore, the effective sample size of the employee survey is 677. After three attempts, 285 surveys were received and deemed valid. Thus, the response rate was 42%, an unusually high rate for survey research. The data collected was averaged on the basis of the number surveyed (285). Out of the 285 respondents, 225 or 79% were Erath County residents (local) and the remaining (21%) commuters. Interestingly, the survey results correspond very closely to the actual number of residents (78%) and commuters (22%) as indicated from the data base of the Office of Human Resources. From the survey data, we calculated the amount and the percentage of income (household) spent on various categories of household expenditures, such as mortgage payment, auto installments, medical co-pays, insurance, etc. The data was organized by the total amount spent in a typical month and the percentage of this amount spent locally. In addition, we also calculated the amount that commuters were spending in the county.

The data collected from the employee questionnaires represented family expenditures which were also based on total family income (non-TSU spouse inclusive).

In order to confine to the university-generated impacts, we decided to use employee salaries rather than the amount revealed in the surveys. We will integrate the survey data along with the salaries as explained later in this report.

According to data provided by Office of Human Resources, the Stephenville campus has a total of 725 full-time and 125 part-time employees. In all, there are 415 staff members, 230 faculty and 80 administrators. By checking the zip codes of the mailing addresses, it was determined that 624 or 74% of all employees reside in Erath County. According to the university's comprehensive expense report (Schedule IV-1) all TSU employees, including student workers (both at Killeen and Stephenville campuses) earned \$40.14 million. In addition, the department of Military Science pays \$430,000 in salaries to the Stephenville staff, which are funded by the federal government and not included in the University salary data (1). To calculate the salaries earned by Stephenville faculty and staff in 2003-04, from the total amount of \$40.14 million, we subtracted \$4.8 million paid to Killeen employees and an additional \$3.04 million paid to student workers (both graduate and undergraduate), which leaves \$32.73 million for employees on the Stephenville campus. The 624 local employees earned \$25.61 million or 78.25% of the total salaries leaving the remaining \$7.05 million or 21.75% for commuters.

The data compiled by Human Resources gave salary figures in gross terms. As consumers spend on goods and services from their disposable income, we adjusted the salary information by subtracting income and social security taxes. Ms. Patricia Smith, CPA and Assistant Professor of Accounting, prepared tax tables which adjusted gross

¹ Salaries earned by employees of the Campus bookstore and Dining Hall are excluded as they will be captured as indirect and induced effects of student spending. Including them could result in double-counting.

income for standard deductions, personal exemptions, and child tax-credits for income ranges from \$10,000 - \$70,000. For incomes exceeding \$70,000, the maximum 35% tax bracket was applied. These tables calculated net income for single individuals with no dependents and for head of the households filing jointly with two children (a copy of tax tables are shown in Appendix G).

We organized the salary data by income brackets and applied the corresponding tax rates or earned income credit for each case. Likewise, we also deducted 1.45% for all income ranges for Medicare taxes and 6.20% for social-security taxes (for a maximum income level of \$87,700). After adjusting for all taxes, the total salaries earned by Tarleton employees were \$28.74 million. The local share of salaries after taxes equaled \$22.85 million. The survey results indicated that commuters spend \$1.2 million in the local economy. Therefore, the direct impact of employee spending (including Military Science personnel) in the county totaled **\$24.05 million**. We now examine the capital expenditures of the university.

(D) Capital Expenditures

The Office of the Vice President of Physical Facilities, Administration and Planning provided expense reports which listed all the new construction projects, equipment bought, remodeling and renovations activities that the university has undertaken. In the last ten years (1994-2004), TSU spent \$89.2 million in capital projects. The reports itemized for each project and activity the dates of initiation and completion, the total cost, and where applicable, the labor expense (associated with university personnel), architectural and engineering (A&E) expense, and administration fees.

While calculating the direct impact of capital expenses, we excluded labor expenses associated with university personnel. These expenses added up to \$1.99 million. The rationale for the exclusion was based upon the realization that the labor expenses reported are for internal records and do not reflect any cash payments to university workers. Including them in the total cost of the project would result in double-counting since the labor expenses for university workers are already reflected in their salaries and wages paid. We now present an overview of each of the capital expenses of the university, beginning with new construction and equipment.

(E) New Construction and Equipment

The annual new construction and equipment expense reflects a 10-year average (1994-2004) of the net amount (total expense adjusted for university labor expense) of the university's construction projects and new equipment purchases and installations. The construction projects in the last ten years have included a \$31 million new science building, a \$7.5 million student housing addition, and a \$14 million 'reconstruction' project of the old science building (from ground-up), which when completed, will house the Mathematics, Physics and Computer Science department. Equipment purchases have included the purchase and installation of a new HVAC system in the dining hall, artificial turf at Memorial Stadium, along with the installation of a new scoreboard and so on.

Over the past ten years, Tarleton has averaged **\$7.30 million** in annual new construction and equipment expenditures. Currently, the university is in the planning stages of several new projects including a \$14 million new student recreation center.

(F) Remodeling and Renovation

As the physical facilities age with time along with the changing needs of the university, several remodeling and renovation projects are undertaken on a continuous basis. These projects have included from installing handicap access ramps on the sidewalks to making roof repairs for storm damage and upgrading sports facilities with additional seating and lighting. Over the past ten years, Tarleton has averaged **\$1.61 million** in remodeling and renovation expenses. At present, the university is in the middle of remodeling the library which will cost \$4 million.

(G) Students

In any educational institution of higher learning, students play a major role in bringing dollars to the local community. They pay tuition and fees, rent apartments, buy food and groceries, open bank accounts, use repair and maintenance shops for the upkeep of their cars, and yes, spend on entertainment. In our analysis, we excluded the \$23.2 million tuition and fees paid as these payments represent sources of revenues and recycle as university's expenses on maintenance & operation, employee salaries, etc. The same logic was applied in excluding \$3.89 million for on-campus housing. Including tuition and dorm fees without offsetting the expenditures on the university side would have amounted to double-counting. We still had to account for the non-tuition/fees (living) expenditures of students at the local and state levels.

To obtain a representative sample of the student living expenditures, surveys were distributed to a cross-section of students which included freshmen, sophomores, juniors, seniors, and graduate students from every college on the campus. In all, 1753 questionnaires were distributed. After evaluating the returned questionnaires, 415 were

deemed invalid and removed from the sample due to incompleteness or obvious falsification, leaving a total of 1338 questionnaires for further analysis. The distribution of the responses organized by academic classification is contrasted against the “actual” distribution of students enrolled is presented in Figure 3.

Figure 3: Comparison of the Actual Versus the Surveyed Distribution of Students



Overall, the representation for freshmen, juniors, and graduate students in the sample was a close match to the actual enrollment, whereas the seniors appear to be over-represented and the juniors under-represented in the sample. We included questions on the survey which asked for place of residence. Anyone identifying an out-of-county residence was considered a commuter and all others as residents. Assuming a representative sample was surveyed, we extrapolated the results to the entire student population. For each student classification, we used survey data with adjustments for sampling bias to classify students as residents and commuters.

For example, our survey results revealed that 95% of the freshman class stayed in Stephenville, mostly in university housing and were considered as residents, leaving the rest to be classified as commuters. After checking these numbers with the Division

of Housing, we adjusted the proportion of residents to be 84% to more accurately reflect the actual distribution between residents and commuters.

On the other hand, 39% of graduate students were classified as commuters based on the information obtained from the surveys. This estimate appears reasonable given that most graduate classes are offered in the evenings to accommodate students working on a full-time basis. Tarleton also offers on-line graduate programs.

The fall 2003 student enrollment was 7,196 and the spring 2004 was 6,768 giving us a nine-month average enrollment for the year to be 6,982. Based on the survey data, the total number of students that were classified as residents added up to 5,343 (77%) and the remaining 16381 as commuters. For a list of all the counties, states, and countries represented in the student population, see Tarleton's website at <www.tarleton.edu/~opeir>. See Table 3, below, for a detailed distribution of students among residents and commuters for each classification.

Table 3: Distribution of Students among Residents and Commuters

Classification	Total Students	Residents	%	Commuters	%
Freshmen	1455	1244	84	211	16
Sophomores	1310	1055	81	255	19
Juniors	1378	1041	76	337	24
Seniors	1907	1438	75	469	25
Graduate Students	931	565	61	366	39
Total	6981	5343	77	1638	23

Using the survey data for each class of students, the resident average monthly expenditures on various items spent locally were calculated. These expenditures were multiplied by the corresponding enrollment for each classification of students. They were then aggregated across for each class of students. To this number, we also add

the expenditures which commuter students indicated spending in the county. Summing both these numbers gives us the total student expenditures in the county (see Table 4).

Table 4: Average Monthly Expenditures for Residents and Commuters

	Freshmen	Sophomores	Juniors	Seniors	Graduate Students
Residents	\$650.26	\$706.64	\$862.41	\$960.82	\$1105.12
Commuters	\$110.85	\$285.06	\$404.54	\$267.04	\$135.04

The total monthly average expenditures of residents for each class of students were multiplied by nine months for the fall and spring semesters which gives a direct local impact of \$36.24 million. The corresponding expenditures of commuters for each class of students yielded a direct local impact at \$3.67 million. Thus, the total local direct impact of student expenditures for the fall and spring semesters was estimated at \$39.91 million (see Table 5). To this number, we add another \$2.59 million that students paid for meal plans (according to records obtained from the university).

Table 5: Direct Local Impact of Resident and Commuter Students by Classification for 9 Month Fall/Spring Period

	Freshmen	Sophomores	Juniors	Seniors	Graduate Students	Total
Resident	\$5,797,849	6,160,215	7,609,677	11,595,699	5,073,118	36,236,558
Commuter	\$217,493	654,201	1,230,611	1,127,165	444,814	3,674,283
Total	\$6,015,342	6,814,416	8,840,288	12,722,864	5,517,932	39,910,841

We repeated the same exercise for each classification for both residents (2625) and commuters (850) for the two one-month summer sessions. The combined expenditures of residents and local expenses of commuters added up to \$4.78 million (\$4.38 million – residents; \$0.40 million – commuters). Summing all the local

expenditures of all the students throughout the year resulted in a grand total of **\$47.28 million**.

Table 6: Breakdown of Direct Local Impact (in millions)

	Fall / Spring Semesters	Summer Sessions	Total
Residents	\$36.23	\$4.38	\$40.61
Commuters	\$3.67	\$0.40	\$4.07
Total	\$39.90	\$4.78	\$44.69

At the state level, there was no distinction between residents and commuters as all the spending was assumed to have occurred within the state. The total spending of TSU students within the state of Texas was equal to **\$80.93 million**.

(H) Visitors

The total visitor impact is an aggregation of expenditures by visitors to the student body, employees, and department-sponsored events.

i. Students' Visitors

To estimate the impact of student visitors, a section of the student survey included questions pertaining to the number of relatives and friends that visit a student in a typical month, their length of stay, and the average daily expenditures incurred by them. The sample data revealed that on the average a typical freshman had 2 visitors per month, who stayed for an average of 1.37 days and spent \$28.86 per day. Assuming that the sample obtained was representative of all the freshmen, we extrapolated the sample averages to the entire enrollment of the resident freshmen students (the commuters were excluded as they do not reside in the county) for 9 months (fall and

spring semesters). The direct expenses for summer were taken by the summer enrollment for freshmen and multiplied by 2 months (the length of the summer classes). We repeated the procedures for sophomores, juniors, seniors and graduate students. The cumulative direct effect of all the student visitors all through the year summed up to \$1.7 million. We also collected information from graduates regarding the expenses incurred by family members and friends at the time of the commencement ceremonies which added up \$150,000. Therefore, the total sum for all student visitors during the year or the direct impact was equal to **\$1.85 million**.

ii. Employees' Visitors

Similar to the student's case, a section of the employee survey included questions pertaining to the number of visitors (relatives and friends) in a typical month, length of stay, and their average daily expenditures as well. The survey data suggested that on the average a typical staff member had 2 visitors per month, who stayed for one day on an average and spent \$32.61 per day. Assuming that the sample obtained was representative of all the staff members, we extrapolated the sample averages to the entire population of staff that were classified as residents for 12 months. The exercise was repeated for the faculty and administrators by their respective numbers. The total direct visitor expenses for all employees of Tarleton were equal to **\$0.22 million**.

iii. Departmental Visitors

Tarleton hosts multiple events all year round; from athletic events, concerts and recitals to UIL competitions and FFA sponsored judging contests. To capture the economic impact of the visitors, a survey was mailed to each department and program on the campus. It included questions inquiring about the number of events sponsored

in the previous year and the number of participants and visitors. For those that sponsored an event, we sought additional information on the length of the event and the estimated expenditures (food, lodging, meals, shopping) by visitors at their event (s). Each event was unique with respect to the type, length, and the background of the visitors. We calculated the actual expenditures spent, on a case-by-case basis, based on the estimates provided to us by the departmental representative. Therefore, the expenses of each departmental or program event are independent of one another.

A few examples are given to illustrate the methodology used to calculate the visitors' expenditures. For determining the lodging expense, we called the local hotels/motels in the area to find out the typical cost of renting a room for a day. The average daily cost of a room was \$60. The number of visitors assigned per room was dependent on the type of visitor. From the discussion we had with the departmental representatives, we assumed that in the case of students, 3-4 would share a room whereas in the case of teachers, professionals, and parents they would either have separate rooms or pair up to share a room.

Meal expenditures were also determined on an event-specific basis; expenditures for food were as follows: breakfast \$2.00 - 4.00, lunch \$5.00 -7.50, dinner \$6.00 -13.50, and snacks \$1.50-2.50. This results in an average daily expenditure per non-public school-oriented visitor of \$20 and a daily expenditure of \$15/student for public school children. This figure varies according to the time of arrival and the time of day that the event was held. Expenditures for meals were excluded when the event provided meals or meals were brought by the participants (e.g. bag lunch for student

commuters). When data was available, direct expenditures provided by the department/program were used.

For estimating expenditures related to the visiting teams at athletic events, each team was evaluated separately to determine the size of the team and staff with which they would typically travel. All athletic events held at TSU that visiting teams could not reasonably commute to and from on the day of the event, were assigned lodging expenses. The remaining teams were only assigned food expenditures for meals depending on the time of the contest.

In total, Tarleton State University attracts more than **80,000** visitors annually to university-sponsored events, including athletic events, judging contests, cultural events organized by the Fine Arts Department, seminars, etc. Among the departments/programs having the greatest impact are the Health and Physical Education Department's athletic events, followed by the Fine Arts Department, the College of Agriculture's contests and UIL competitions (see Table 7, below). The total direct impact of university visitors was estimated at **\$2.47Million**.

Table 7: Departments and Programs with Highest number of Visitors and With the Largest Impact

Department / Program	Number of annual visitors	Direct impact
Athletics	11,353	\$638,766
Total Agricultural Events	14,793	\$471,197
Fine Arts Department	11,672	\$380,319
UIL Competitions	8,776	\$244,438
Orientation	1,714	\$222,907
Other Departments/Programs	16,073	\$513,873
Total	64,381	\$2,471,500

By summing all the visitors from all sources (see table 8) the total direct local impact equals **\$4.6 Million**.

Table 8: Summary of Visitors' Impact

Category	Number of Visitors	Direct Impact (in millions)
Department/ Program	64,381	\$2.47
Student	15,136	\$1.85
Employee	576	\$0.218
Retirees	65	\$0.037
Total	80,158	\$4.575

I. Retirees

The impact of a university can also extend to the expenditures associated with its retirees. After all, they worked for the institution, earned income and while working contributed to social security and participated in pension plans. Thus, to complete the circle of the impacts, we also consider the economic role of the university's retirees. According to data provided by the Office of Human Resources, the total number of retirees is 262. Using the assistance of Dr. Brad Chilton, Director of the Office of Planning, Evaluation, and Institutional Research (OPIER), the retirees were further classified as administrators, faculty, and staff. In all, there are 16 former administrators, 88 faculty, and 146 staff. Out of these, 250 or 95% live in Texas, out of which 185 or 71% reside in the county.

To assess the income and spending patterns of Tarleton's retirees, a survey was designed and mailed to all the Tarleton retirees living in the state. After a couple of mailings, 98 usable surveys were received with a response rate of 39%, an unusually good response rate for survey research. From the returned surveys, retirees were classified as residents and non-residents, and the average monthly income,

expenditures and proportion spent locally were estimated for each of the subgroup (see Table 9).

Table 9: Annual Income and Expenditures and the Proportion Spent Locally for Tarleton Retirees (all amounts in millions)

	Administration	Faculty	Staff	Total
Total Income	\$1.52	\$5.37	\$5.15	\$12.04
Total Expenditures	\$0.94	\$3.54	\$3.18	\$7.66
Total Spent in Erath County	\$0.18	\$1.48	\$1.66	\$3.32
Total Spent in Texas	\$0.81	\$3.06	\$2.93	\$6.80

From the sample data, the monthly expenditures were extrapolated on an annualized basis to the corresponding retiree population in each subgroup of administrators, faculty and staff for local residents. For calculating the state impacts, residents and non-residents were treated alike as all cases represented living and spending their proportions within the state.

As can be observed from Table 9, the direct impact of all retirees in the county added up to **\$3.32 million** and for the state equaled **\$6.8 million**.

V. Methodology

The major portion of the economic impact analysis was performed using the IMPLAN input/output model. The theoretical basis for the model comes from work done by Wassily Leontief, for which he won a Nobel Prize. Leontief completed input/output studies of the U.S. economy for 1919, 1929, and 1939. Since that time, use of the input/output model has spread. The model contains three basic components: the flow-table, direct coefficients, and indirect & induced coefficients. Two fundamental assumptions are associated with the model. First, the direct coefficients are fixed. Fixed coefficients require the assumption of static technology. This assumption means

the coefficients must be periodically adjusted to better represent the real world.

Second, there are no errors of aggregation. The output multiplier and the employment multiplier are important derivations from the model.

The IMPLAN system was initially developed in 1979 by the United States Forest Service and then privatized to the Minnesota Implan Group, Incorporated (MIG, Inc.). The first IMPLAN system was a non-interactive mainframe application. Micro IMPLAN was released in 1989 and IMPLAN Pro, a Windows interactive program, is the latest, released in 1996 with periodic model and data updates. Analysis is possible by state, by county, or by specially-created regions, with the county as the smallest unit of measure.

IMPLAN and other input/output models attempt to estimate the large economic impacts of expenditures, policies and institutions, such as the university, that occur through forward and backward linkages in the economy. Backward linkages are purchased inputs, supplies, and services. Forward linkages include further value-added economic activities, such as preparation and processing. By going beyond measuring only direct impacts, these models give more complete pictures of the economic effects of policy options.

IMPLAN is basically a general accounting system of the transactions taking place in an economy between industries, businesses, and consumers. Purchases and sales are adjusted for in-state versus out-of-state, or in-region versus out-of-region sources, and are then summed to arrive at estimates of total impacts arising from an initial policy change. The IMPLAN model estimates impacts on total output (sales), personal income, value-added, taxes, and employment.

IMPLAN's data sets are derived from several sources which include national, state and local data from the Bureau of Economic Analysis' Regional Economic Information (RIES), Bureau of Labor Statistics, Bureau of Economic Analysis' Benchmark Input-Output Study, and County Business Patterns. Further details of data sources and methods could be found in the IMPLAN User's Guide (IMPLAN).

In this study, the IMPLAN model is used to estimate the economic impact of Tarleton State University on Erath County and the state of Texas. The university's economic impact is inclusive of the impacts from the expenditures of students, university employees (salaries), visitors, retirees and university expenditures including M & O, new construction and equipment, and remodeling & renovations (refer to Figure 1, Conceptual Framework). Basic information on all of these categories was collected locally from survey data and university financial records. This local information was matched with other data developed for the IMPLAN model by MIG, Inc.

All impacts were calculated on the 2001 Erath County model constructed with all SAM (social accounting matrices) sectors included, except Federal spending. Since there are no large towns within 60 miles of Stephenville, the county seat, Erath County, provides an ideal economic impact area (Fort Worth is 65 miles away) because it contains most basic services within the area and is generally isolated from outside markets. However, Erath County is small (population of 33,111) and contains only 128 of the 528 sectors in the IMPLAN model. With so many missing sectors, economic multiplier effects are obviously smaller than larger economic areas, such as the entire state of Texas. Before the results are presented, it could be prudent to define the basic terms that will be utilized to explain the findings.

Direct Effects – The initial immediate effects caused by a specific activity; for example, the initial investment in the construction of a new classroom building or university housing complex or the effects of the purchase utilities and supplies and the hiring of local employees, etc. The direct effect, or impact, will subsequently initiate a series of iterative rounds of income creation, spending, and re-spending that will result in indirect effects and induced effects. These three component effects—direct, indirect, and induced effects—constitute the total effects resulting from the initial, direct effect.

Indirect Effects – The effects that result from the actions of the processing sectors to produce the direct effects. Therefore, the indirect effects are those changes to production, employment, incomes, etc., which take place as a result of the direct effects and include the effects on industry sectors that may be directly or indirectly related to the initially impacted sector.

Induced Effects – The effects of household spending in the regional economy are the result of direct and indirect effects of some economic activity. The induced effects arise from a general change in the household sector's earnings and spending patterns economic changes due to direct and indirect effects. Further I-O development has allowed a flexible number of sectors including state, local, and federal spending and corporations to be added to this model. Social Accounting Matrices (SAM) reports include all commodity flows, not only purchases and production of sales commodities, but transfer payments to and from institutions. Since the biggest additional sectors are normally household spending, these SAM effects are still called induced effects.

Leakages – Those expenditures that “leak” out of the county and cannot be included in estimating the economic impact at the local level. For example, when the university purchases office supplies, if they buy from a local office supply business, then the profits and subsequent employment stay within the region. However when the same office supplies are purchased outside the region, the economic effects are felt in the region from which the supplies were imported, and the positive gains cannot be captured locally. Appropriate adjustments will have to be made to properly estimate the effects at the local level.

Multiplier – A numeric measurement expressed as a mathematical ratio of the total effects (including the direct, indirect, and induced effects) to the direct effects of a specific activity, or a change in some activity. For example, a multiplier of 1.33 indicates that for every dollar spent (direct expenditure) an additional \$0.33 (indirect) is generated within the economy.

Deflator --Deflators are used to convert impact expenditures from current year to the base year of the predictive multipliers. Conversely, the deflators can be used to inflate the study area and impact reports to the current year.

The IMPLAN 2001 data (latest) was used to calculate the impact at the county and state level. As stated, the deflators are used if the expenditure dollars are for a year different than the model’s data. Accordingly, the numbers had been adjusted (inflated) to the study area to the current year (2004) in order to perform the analysis for these categories. We now discuss the results of the IMPLAN analysis which is divided into two sections. The first section will report and analyze the results at the county level followed by the same at the state level.

Total Value Added -- represents the amount by which the value of a good or service increases at each stage of production. The increase in value is associated by adding utility associated with the form, place, time or possession characteristics. Thus, the total value added captures the additional amount which the local or state economy adds to the goods or services from its original content. In the next section, we will present a brief description and analysis of the various impacts of the university at the county level.

VI. County Level Impacts

The county-level impacts are organized for expenditures of the University (M&O, Construction, Remodeling/Renovation), Employees, Students, Visitors, and Retirees.

A. M & O Expenditures

In the calculation of the impact from the M&O expenditures the direct impact amount of \$21.53 million was entered into the IMPLAN model, using the sector "State Local Government Consumption Expenditures of Public Education beyond High School". This sector includes sectors which reflect the spending patterns of institutions of higher learning supported by the state. As the details of the M&O expenditure data provided by the administration were neither adequate nor dependable, we used the IMPLAN model RPCs for calculating the impacts at the county and state levels.

Once the data was processed, the results indicated that the total effects inclusive of the direct, indirect and induced impacts (see methodology for definitions of the impacts) totaled \$29.58 million with an output multiplier of 1.37. The direct M&O spending of \$21.53 million resulted in 208 jobs; an additional 125 jobs were created due to indirect and induced effects generating a total of 333 jobs. The total value added (TVA) for the M&O expenditures equaled \$11.92 million. (See Table 10, below, for a summary of M&O impacts.)

Table 10: Summary of M&O Impacts

(all amounts in millions, except employment numbers and multipliers)

	Direct	Indirect	Induced	Total	Multiplier
Output	\$21.53	\$2.89	\$5.15	\$29.58	1.37
Employment	208	41	84	333	1.60
TVA	\$7.30	\$1.48	\$3.13	\$11.92	1.63

B. Employees

The survey data collected from university employees allowed us to calculate the regional purchase coefficient (RPC) or the percentage of employee spending that occurs within the county for the various spending sectors (also derived from survey data) are shown below in Table 11. The survey RPCs were used in place of the default RPCs that are preprogrammed into the IMPLAN model software; by doing this we are better able to reflect the true spending habits of the employees in Erath County. The RPCs for commuter spending in all sectors was set at 1.00 because commuter employees were only asked about in-county spending.

Table 11: Distribution of Employee Expenditures

	Percentage of Spending	Resident RPCs	Amount Spent	IMPLAN sector/s used
Utilities	12.61%	0.910	\$2,889,884	30,31,32,422
Food	16.93%	0.964	\$4,200,299	405
Fast Food	5.32%	0.833	\$1,321,876	481
Retail	4.72%	0.712	\$1,164,007	410
Entertainment	2.41%	0.823	\$558,774	433,478
Medical	4.75%	0.863	\$1,135,378	406,465,467
Home Repair	2.60%	0.955	\$597,712	42
Insurance	11.73%	0.856	\$2,787,296	427
Mortgage	11.91%	0.348	\$2,769,417	430
Property Taxes	6.28%	0.761	\$1,442,539	503,504
Auto Installments	5.89%	0.217	\$1,429,330	425
Auto Gas & Repair	6.77%	0.848	\$1,752,326	407,483
Miscellaneous	8.08%	0.737	\$2,003,232	411
Total	100.00%		\$24,052,071	

Note: These amounts include the employee commuter spending which is calculated at 100% of their spending in these categories.

The commuters combined with the resident employees spent \$24.05 million (direct impact) in Erath County. The additional indirect and induced effects added \$10.71 million to give an overall impact of the employees' local expenditures equal to **\$34.76 million**. The output multiplier for the local employee spending was 1.45. The total employee spending created 512 jobs in Erath County. The total value added attributed to employee expenditures was \$15.99 million (see Table 12).

Table 12: Summary of Employee Impacts

(all amounts in millions, except employment numbers and multipliers)

	Direct	Indirect	Induced	Total	Multiplier
Output	\$24.05	\$3.71	\$6.98	\$34.76	1.45
Employment	337	61	115	512	1.52
TVA	\$9.56	\$2.15	\$4.27	\$15.99	1.67

C. New Construction

The new construction spending by the university during the ten year period of 1994-2004 averaged on an annual basis of \$7.03 million. The IMPLAN Sector 38, "Commercial and Institutional buildings," was used to determine the direct and indirect/induced impact of this category. As the details of the construction expenses with respect to the location of the purchase of inputs were not available, the model RPCs were used for calculating the impacts at the county and state levels.

The direct impact amount of \$7.30 million produced a combined indirect and induced impact of \$2.20 million. The total impact is calculated to be \$9.51 million with an output multiplier of 1.3. It is not unusual for a construction multiplier to be lower than the multipliers for other types of spending because of the fact that outside contractors often are used for the large projects. These contractors may not only buy inputs from outside the county but may also hire architects and engineers and skilled workers from outside the county. The university's expenditures on new construction created 63 new

jobs directly and 35 indirect and induced jobs thereby producing a total of 98 jobs in the county. The Total Value Added for new construction amounted to \$3.36 million; \$2.05 million from direct spending and \$1.31 million from indirect and induced spending (see Table 13 below).

Table 13: Summary of Impacts for New Construction

(all amounts in millions, except employment numbers and multipliers)

	Direct	Indirect	Induced	Total	Multiplier
Output	\$7.30	\$0.71	\$1.48	\$9.51	1.30
Employment	63	11	24	98	1.56
TVA	\$2.05	\$0.39	\$0.91	\$3.36	1.64

D. Health Benefits (Medical)

The data received from the university’s administration indicated that employees received \$10.12 million in benefits in the 2003-04 academic year. Out of this amount, \$4.93 million was for health related costs. The proportion of these benefits accruing to the resident employees (78%) was \$3.9 million. This amount was applied to the three IMPLAN sectors, 465 (“Offices of Physicians Dentists, and other Health Care”), 467 (“Hospitals”) and 406 (“Health and Personal Care Stores”). The IMPLAN model RPCs were applied in calculating the effects.

The direct spending of \$3.9 million by the local resident employees resulted in an indirect/induced impact of \$1.83 million and an overall output impact of \$5.73 million in the county. The direct employment of 51 jobs for this category produced an indirect/induced employment of 31 jobs, thereby generating an overall employment impact of 82 jobs. The direct TVA for the employees’ health benefits was \$1.87 million which created an indirect/induced value of \$1.1 million producing an overall value added impact of \$2.97 million (see table 14 below).

Table 14: Summary of Impacts from Health Benefits

(all amounts in millions, except employment numbers and multipliers)

	Direct	Indirect	Induced	Total	Multiplier
Output	\$3.9	\$0.52	\$1.30	\$5.73	1.58
Employment	51	9	21	82	1.60
TVA	\$1.87	\$0.31	\$0.79	\$2.97	1.58

E. Remodeling / Renovation

During the previous ten-year period (1994-2004) the university has averaged an annual remodeling and renovation expenditure of \$1.61 million. This has included various major and minor projects as discussed earlier. IMPLAN sector number 43, “Maintenance and Repairs of Nonresidential Buildings”, was used in the calculation of the impact. As the details of the renovation and remodeling expenditures with respect to the location of the purchases were not available, the model RPCs were used for calculating the impacts at the county and state levels. The \$1.61 million as the direct effect resulted in a combined indirect and induced effect of \$0.64 million making the total output effect of \$2.26 million with a multiplier of 1.4. This category of university expenditures generated a direct employment of 18 jobs and an indirect/induced employment of 11 thereby creating a total of 29 jobs, with an employment multiplier of 1.61. Likewise, the TVA for this sector had a direct impact of \$0.63 million and an indirect/induced impact of \$0.37 million (see Table 15, below).

Table 15: Summary of Remodeling and Renovation Impacts

(all amounts in millions, except employment numbers and multipliers)

	Direct	Indirect	Induced	Total	Multiplier
Output	\$1.61	\$0.19	\$0.45	\$2.26	1.40
Employment	18	3	8	29	1.61
TVA	\$0.63	\$0.1	\$0.27	\$1.02	1.62

F. Students

Student expenditures were estimated from surveys. As stated earlier, these expenditures were sub-classified for resident students (living within Erath County during the school year) and commuting students. The average monthly expenditures were calculated for students during the fall, spring, and summer sessions for each class of students. The monthly expenditures for each class of students were as follows: freshmen - \$650.26, sophomores - \$706.64, juniors - \$862.41, seniors - \$960.82, and graduate students - \$1,105.12. These average expenditures were multiplied by the total number enrolled in each class by a factor of 9 (for Fall and Spring semesters) and by the number of students enrolled in each class by 2 (for the Summer sessions). Summing up all these expenditures added to \$44.69 million. Two further adjustments had to be made. According to the housing department, the students who reside in university housing paid an estimated \$3.88 million to the university during 2003-04. We decided to exclude this amount from the overall student expenditures as including them would have resulted in duplication of the amount which is captured in other categories of study. The housing fees paid by students are recycled and spent by the university toward employee salaries, maintenance and operations, renovation/remodeling and other activities. The meal plan amount spent by the students on-campus during 2003-04 was \$2.59 million and was added to the overall student expenditures to analyze the impact. After all these adjustments, the total student spending in the county amounted to \$47.28 million in direct impact – the single largest impact. The survey data also revealed the relative proportions of student spending by different categories. Using these proportions, the total amount was spread into 12 expenditure categories (see Table 16 below).

Table 16: Distribution of Student Spending in Erath County

Category	Total Student Expenditures	IMPLAN Sectors Used
Utilities (12%)	\$5,756,215	30 Power Generation & Supply 422 Telecommunications
Grocery (13%)	\$6,170,636	405 Food & Beverage Stores
Fast Food (7%)	\$3,447,550	481 Food Services & Drinking Places
Retail (3%)	\$1,862,691	410 General Merchandise Stores
Entertainment (3%)	\$1,616,607	433 Video Tape & Disc Rental 478 Other Amusement
Medical (2%)	\$734,124	465 Physicians & Dentists 467 Hospitals 406 Health & Personal Care Stores
Insurance (3%)	\$1,309,863	427 Insurance Carriers
Rent (19%)	\$8,946,002	479 Hotels & Motels (Proxy for Apartments)
Auto Installments (4%)	\$1,692,727	425 Nondepository Credit Intermediation
Auto Gas & Repairs (9%)	\$4,319,003	407 Gasoline Stations 483 Automotive Repairs & Maintenance
Books (12%)	\$5,450,058	409 Sporting Goods, hobby and Books
Miscellaneous (7%)	\$3,390,120	411 Miscellaneous Store Retailers
Total \$ spent in Erath	\$44,695,597	
Meal Plans (6%)	\$2,590,394	481 Food Services & Drinking Places
Total Spent in County	\$47,285,991	

These expenditures were imported into 17 IMPLAN sectors which fit closely to the spending categories. Since the survey data was based on student expenditures within Erath County, the local purchase coefficient (LPC) was set at 1.0. The analysis showed that the \$47.28 million direct effect produced an additional indirect and induced effect of \$28.76 million for a total overall impact of \$76.05 million. The output multiplier for the local student spending was equal to 1.60. The \$76 million spent created 883 new jobs from the direct effects and an additional 464 jobs from indirect and induced effects for a total of 1347 jobs in the county. The employment multiplier derived by dividing total jobs by the number of direct jobs was 1.52. The local Total Value Added from student spending was calculated to be \$42.97 million. (See Table 17 for a summary of student spending impacts.)

Table 17: Summary of Student Impacts

(All amounts in millions, except employment numbers and multiplier)

	Direct	Indirect	Induced	Total	Multiplier
Output	\$47.28	\$9.54	\$19.21	\$76.05	1.61
Employment	883	143	321	1347	1.53
TVA	\$25.61	\$5.38	\$11.96	\$42.97	1.68

G. Visitors' Impact

The direct impact caused by the expenditures from the all the visitors to the county was estimated at \$4.57 million. For IMPLAN analysis, this amount was divided into food, gasoline, lodging, and retail shopping sectors and combined in the group "Visitation Impacts". The corresponding IMPLAN sectors for each of these sectors is 481 ("Food Services and Drinking Places"), 479 ("Hotels and motels"), 407 ("Gasoline Stations"), and 411 ("Miscellaneous Store Retailers"). The direct impact of \$4.57 million resulted in a combined indirect and induced impact of \$2.77 million to give an overall impact of \$7.35 million, with a multiplier of 1.60. The visitors' expenditures gave way to the creation of an estimated 146 additional jobs in the county. The direct employment generated due to these expenditures was 103 jobs and an additional 43 jobs due to indirect and induced effects. The employment multiplier for visitors was 1.41. The total value added of all the visitors' expenditures equaled \$4.10 million (see table 18 below).

Table 18: Summary of Visitor Impacts

(all amounts in millions, except employment numbers and multiplier)

	Direct	Indirect	Induced	Total	Multiplier
Output	\$4.57	\$0.92	\$1.85	\$7.35	1.61
Employment	103	13	31	146	1.42
TVA	\$2.44	\$0.51	\$1.15	\$4.10	1.68

H. Retirees' Impact

As stated in an earlier section, the total amount that Tarleton retirees spent in the county was equal to \$3.32 million. Unlike other categories of spending such as students, employees, visitors, and university expenditures, we faced a problem to model the retiree expenditures. The survey instrument mailed to retirees was simple and avoided seeking details with respect to the distribution of expenditures among various spending categories. To resolve this problem, we had two choices. One was to adapt the household function either from the employee surveys or the IMPLAN model and use the appropriate proportions of expenditures. There were two problems in this approach. Had we used the household function from the employee surveys, we would have introduced a bias as the spending pattern of current employees do not match those that are retired due to age, relative weights assigned to expenditures for food, medical care, housing, etc. Our survey of the retiree population had strong indicators of heterogeneity and thus taking a single household income group from the choices offered by IMPLAN model and generalizing it to the entire retiree population was not considered appropriate as well. To resolve this issue we researched and found three sources that offered guidelines to develop a composite of spending pattern by the elderly (Consumer Expenditures in 2002, Rubin and Nieswiadomy, and Hobijn & Lagakos). Using these sources, we constructed a weighted average of the retiree expenditures patterns which are given in Table 19. We calculated the impact of the retirees by multiplying the amounts spent in each category by assigning the relevant IMPLAN sectors.

Table 19: Retiree Weighted Average Spending

	Spending %s	Amount	IMPLAN Sectors
Food	13 %	\$418,085	405
Fast Food	5 %	\$179,179	481
Mortgage	27 %	\$898,284	430
Utilities	6 %	\$168,428	30,31,32,422
Property Taxes	5 %	\$182,464	503,504
Home repair	4 %	\$154,393	42
Auto Installments	9 %	\$277,794	425
Auto repairs	7 %	\$256,425	483
Insurance	7 %	\$224,691	427
Medical	5 %	\$191,403	406,465,467
Recreation	3 %	\$130,071	433,478
Miscellaneous	9 %	\$236,915	411
Total	100.00%	\$3,318,131	

The total effects inclusive of direct, indirect and induced effects equaled **\$5.20 million**. The employment generated due to the retiree spending in the county was 88 jobs with an employment multiplier of 1.52. The corresponding total value added for retiree spending totaled \$3.10million (see table 20, below)

Table 20: Summary of Retiree Impacts

(all amounts in millions, except employment numbers and multiplier)

	Direct	Indirect	Induced	Total	Multiplier
Output	\$3.31	\$0.58	\$1.30	\$5.20	1.57
Employment	58	9	21	88	1.52
TVA	\$1.98	\$0.33	\$0.78	\$3.10	1.57

Summary of Local Impacts

Using the IMPLAN model, the multiplier effects at the local level were calculated for output, employment, and value-added are given in Tables 21-23. The overall impact of Tarleton State University – Stephenville at the county level in terms of output was **\$170.5 million** with an output multiplier of **1.5**. In terms of employment, Tarleton

contributes to the creation of 2575 jobs in addition to 840 jobs on the campus (725 full-time and 125 part-time) to give a total of **3415 jobs** in the county, which can be attributed to the presence of the university in the county. The employment multiplier was **1.53**. The overall total value added at the county level summed up to **\$85.42 million**.

A closer examination of the impacts indicates that the multipliers of different sectors are not uniform. For example, the student expenditure multiplier was higher than that for faculty/staff (salary), since it is assumed that the marginal propensity to consume for students would be higher than for faculty/staff. In addition, we can also expect that the demand structure of students (non-durables, such as food, gas & entertainment) is more likely to be met by local suppliers, as compared to faculty/staff whose demand structure will include durables (furniture, appliances, automobiles, etc.) and non-durables. Given the nature of the local economy, the durable component is not likely to be served as efficiently by local businesses. Likewise, the multipliers for construction, M&O, and capital outlays were relatively small since expenditures in these categories are likely to be only partially met by the local economy.

By far the largest impact on the local economy (the county) comes from the presence of students in the community. According to our calculations, students collectively contribute more than \$76 million in output and their spending creates more than 1300 jobs. The next largest contribution is from employee spending followed by M&O expenditures of the university. A list of all these impacts is given in Tables 21-23.

Table 21: Summary of Local Output Impacts For All Spending Categories

(in millions, except multiplier)

Category	Direct Impact	Indirect Impact	Induced Impact	Total Impact	Multiplier
M&O	21.50	2.90	5.19	29.58	1.37
New Construction & Equipment	7.30	0.72	1.49	9.51	1.30
Remodeling & Renovation	1.61	0.19	0.45	2.26	1.40
Employees	24.05	3.72	6.99	34.76	1.45
Health Benefits	3.90	0.53	1.31	5.73	1.47
Students	47.29	9.55	19.20	76.05	1.61
Visitors	4.58	0.92	1.85	7.35	1.61
Retirees	3.32	0.58	1.31	5.20	1.57
Total	113.59	19.10	37.77	170.46	1.50

Table 22: Summary of Local Employment Impacts For All Spending Categories

(in number of jobs, except multiplier)

Category	Direct Impact	Indirect Impact	Induced Impact	Total Impact	Multiplier
M&O	208	41	84	333	1.60
New Construction & Equipment	63	11	25	98	1.56
Remodeling & Renovation	18	3	7	29	1.58
Employees	296	53	104	453	1.53
Health Benefits	51	10	21	82	1.59
Students	884	143	321	1347	1.52
Visitors	103	13	31	146	1.42
Retirees	58	9	21	88	1.53
Total	1680	282	614	2575	1.53

Table 23: Summary of Local Total Value Added For All Spending Categories
(in millions, except multiplier)

Category	Direct Impact	Indirect Impact	Induced Impact	Total Impact	Multiplier
M&O	\$7.30	\$1.48	\$3.13	\$11.92	1.63
New Construction & Equipment	2.05	0.39	0.91	3.36	1.64
Remodeling & Renovation	0.63	0.10	0.27	1.02	1.62
Employees	9.56	2.15	4.27	15.99	1.67
Health Benefits	1.87	0.31	0.79	2.97	1.58
Students	25.61	5.38	11.96	42.97	1.68
Visitors	2.44	0.51	1.15	4.10	1.68
Retirees	1.98	0.33	0.78	3.10	1.57
Total	\$51.44	\$10.65	\$23.26	\$85.42	1.66

* Numbers may not match with numbers in Table 26 due to rounding.

VI. State Multipliers

We had the 2001 Texas State Model for calculating the state impacts. There are three possible ways of looking at the Texas model.

[a] The marginal approach would assume that most Texas students would go to another Texas school, leaving only net impact from the out-of-state (including international) students drawn to Tarleton. All state expenditures would go to a different Texas university, providing little difference in the overall state impacts. The net impact could be estimated by dividing the total impact of university expenditures by the percentage of out-of-state students, plus direct spending of these out-of-state students. Within Texas, the only significant location differences would occur in border areas, such as El Paso, Texarkana or the towns bordering Oklahoma and New Mexico. There would be more leakage from these border towns, but they also may draw more out-of-state students.

[b] The second approach considers the university without an in-state replacement. It assumes that if the university was not there, students would not go to another Texas college, but either go out-of-state, or find a job, and thus the state will lose all the economic benefits.

[c] Another approach is to consider the students moving to another college or university within the state as a transfer student. Adopting this approach provides a study plan similar to the Erath County study. If students had not attended TSU, they would most likely attend other schools in the state, and these schools will realize the additional economic impact from the 'transfer' students. Just as we do not exclude from our study the economic role of transfer students (from other schools in Texas) in calculating our local impact, we do not exclude the role that 'in-state' students have at the state level. Indeed, the rest of the impacts of M&O, construction and other services will all increase at other schools within the state if TSU is to shut down. We have adopted this approach in our analysis and conclusions.

In order to estimate the statewide impacts there were two issues. The first one entailed estimating the actual expenditures spent by students, employees, retirees and the amount spent by the university within the state. Next, we had to also adjust the RPCs to reflect the proportion of the total amount spent in the state.

For the actual expenditures spent at the state level, we essentially considered the entire amount estimated for the student and employee expenses without differentiating between resident and commuters. To calculate the actual amount spent within the state, we rely on the model RPCs. In general, we should expect the statewide RPCs to be higher as compared to the local RPCs as a smaller amount spent

will be leaked at the state level as compared with the local level. This difference coupled with the fact that the state model uses 495 out of a possible 509 sectors (as compared to only 145 sectors at the county) should yield higher multipliers.

The salaries of Tarleton employees had been adjusted to \$28.74 million, which was earned by the employees after deductions in the year 2003-04. This included the local resident employees and the commuter employees' salaries, and no distinction was made between them in the state impact analysis as it was done in the county analysis, since it is assumed that all the employees spend their money within the state. The survey data percentages of spending patterns of the employees at the state level was used and applied accordingly to the total amount, and the IMPLAN model RPCs had been applied to this amount in order to know the actual impact of the employees at the state level.

Similarly, the students spending at the state level was \$80.93 million as compared to \$47.28 million in the county. The student survey expenditure percentages were applied to this amount to know the impact at the state level with model RPCs applied. The sector 479 ("Hotels and Motels including Casino Hotels") was used as a proxy for the off-campus accommodations for students with proper adjustments

The direct effects at the state level added up to \$155 million due to the fact that there was no distinction between commuter and resident spending. Due to the high RPCs at the state level coupled with the fact that there are more sectors at the state level, the indirect and the induced effects were larger as well. The total indirect effects were \$43.5 million and the induced an additional \$113 million. Thus, the total effects

which is derived by adding the direct, indirect, and induced effects add up to **\$311 million**. The overall multiplier at the state level was **2.01**, higher than the county level multiplier of 1.5. For a breakdown of all the output state multipliers, refer to Table 24.

Table 24: Summary of Output Impacts For All Spending Categories at the State Level
(in millions, except multiplier)

Category	Direct Impact	Indirect Impact	Induced Impact	Total Impact	Multiplier
M&O	\$21.53	\$6.52	\$13.32	\$41.37	1.92
New Construction & Equipment	7.31	1.57	4.10	12.98	1.78
Remodeling & Renovation	1.61	0.37	0.90	2.88	1.79
Employees	28.74	7.59	21.77	58.10	2.02
Health Benefits	4.93	1.47	4.31	10.71	2.17
Students	80.93	22.89	60.33	164.16	2.03
Visitors	3.13	1.21	2.85	7.19	2.30
Retirees	6.79	1.89	5.05	13.73	2.02
Total	\$154.98	\$43.52	\$112.61	\$311.11	2.01

Employment generation was also higher at the state level as compared to the county level. The \$155 million direct spending created 1549 jobs and the indirect and induced effects of \$156 million created another 1617 jobs for a total of 3166 jobs in the state. If we add 840 jobs on the campus (715 full-time & 125 part-time), Tarleton's Stephenville campus contributes to creating 4006 jobs in the state. A detailed breakdown of jobs created due to spending at Tarleton is given in Table 25.

Besides output and employment effects, we also estimated the total value added (TVA) and the employee compensation (wages) component using the IMPLAN model. The state TVA was estimated at \$166.25 Million. The highest value added is attributed to student expenditures, followed by employee-spending, and M&O expenses. A list of all the value-added by different categories is shown in Table 26.

Table 25: Summary of Employment Impacts For All Spending Categories at the State Level (in number of jobs, except multiplier)

	Direct Impact	Indirect Impact	Induced Impact	Total Impact	Multiplier
M&O	122	51	145	317	2.61
New Construction & Equipment	48	14	44	106	2.21
Remodeling & Renovation	11	3	10	24	2.15
Employees	298	72	237	606	2.04
Health Benefits	54	15	46	115	2.14
Students	882	208	658	1748	1.98
Visitors	64	11	31	106	1.66
Retirees	71	18	55	144	2.03
Total	1549	391	1226	3166	2.04

Table 26: Summary of Total Value Added For All Spending Categories at the State Level (in millions, except multiplier)

Category	Direct Impact	Indirect Impact	Induced Impact	Total Impact	Multiplier
M&O	\$8.26	\$3.52	\$7.87	\$19.65	2.38
New Construction & Equipment	2.69	0.93	2.42	6.04	2.25
Remodeling & Renovation	0.58	0.21	0.53	1.33	2.29
Employees	14.81	4.72	12.86	32.38	2.19
Health Benefits	2.88	0.91	2.53	6.32	2.19
Students	39.07	13.92	35.87	88.87	2.27
Visitors	1.78	0.68	1.70	4.16	2.34
Retirees	3.37	1.16	2.98	7.51	2.23
Total	\$73.44	\$26.05	\$66.76	\$166.25	2.26

Major Industries in Erath County Affected by Tarleton State University

From the model results, we also extracted information on output and employment for industries that were the most impacted by the presence of the university in the county. These industries will be on the top of the list that could either benefit or lose by the increase or decrease of spending associated with the university in the county.

Significant output (sales) impacts occurred in numerous sectors with a heavy concentration in the service industries. In terms of relative significance, businesses that benefits the most in terms of output produced (sales) are Restaurants & Bars, Grocery stores, Retail stores, Off-campus housing (apartment-rentals and other accommodations), Utilities (power generation & supply), Banks & Credit Institutions, Book Stores, and the State & Local Government. See Table 27 for a list of selected industries in the county with significant impact due to the existence of the university.

As recognized earlier, the university also contributes to the employment in the county. Again, the service sectors are affected the most by the university's presence in the county. In terms of importance, the university contributes in creating jobs (taking into account the direct, indirect and induced effects) mainly in Eating and drinking places (333), Retail stores (266), Grocery stores (255), State & Local Government (176), Gasoline stations (104), Movie, Video and Entertainment places (81) and Banks and Credit Institutions (80). A detailed list of the major sectors, which are impacted by the University, is given in Table 28.

In the case of total value added at the local level, by far the sectors which shows the largest impact are the State and Local governments. Indeed, the indirect and induced effects represents 77% of the total value added represented by these sectors. Other sectors in order of importance are Off-Campus Housing, Grocery stores, Banks and Credit institutions. A list of all the major sectors represented are given in Table 29. A closer examinations of Tables 27-29 indicate that there is generally an overlap in the representation of the same sectors (not in the same order) in all the three tables.

Table 27: Selected Industries in Erath County Impacted by Tarleton State University and Related Added Employment

IMPLAN Sectors	Sector Title	Direct	Indirect / Induced	Total Output	Total Employment
481	Eating & Drinking Places	9,422,966	2,270,833	11,693,800	333
405	Grocery Stores	10,348,361	848,632	11,196,993	255
410 & 411	Retail store	8,853,738	1,174,280	10,028,018	266
	Off-Campus Housing	8,476,783	218,792	8,695,575	32
30	Power generation / supply	6,467,488	2,099,778	8,567,266	45
425 & 430	Banks / Credit Institutions	5,007,561	3,082,918	8,090,480	80
503 & 504	State / Local Government	1,439,555	5,089,871	6,529,426	176
407	Gasoline stations	4,971,468	368,377	5,339,845	104
427 & 428	Insurance	3,410,551	1,563,259	4,973,809	43
422	Telecommunications	4,118,193	673,728	4,791,921	26
509	Owner-occupied dwellings	0	4,203,808	4,203,808	-
483	Auto repair & maintenance	1,958,538	1,754,615	3,713,153	38
465	Doctor & Dentist Offices	1,947,393	1,647,055	3,594,448	54
390	Wholesale trade	1,134,186	2,326,244	3,460,430	49
467	Hospitals	1,997,915	1,332,497	3,330,412	31
	All Other Sectors	44,035,143	28,220,102	72,174,234	1043
	Total	113,589,829	56,874,789	170,464,618	2,575

Table 28: Erath County Industries with Greatest Employment Impacts

IMPLAN Sectors	Industry	Direct	Indirect / Induced	Total Jobs
481	Eating & Drinking Places	268	65	333
410 & 411	Retail Stores	233	33	266
405	Grocery Stores	235	20	255
503 & 504	State & Local Government	37	139	175
407	Gasoline Stations	97	7	104
433 & 478	Movie & Video Rental / Other Amusement	76	5	81
425 & 430	Banks & Credit Institutions	53	27	80
465	Doctors & Dentists Offices	29	25	54
406	Health and personal care stores	40	13	53
390	Wholesale trade	16	33	49
454	Employment services	12	36	48
458	Services to buildings and dwellings	29	17	46
30	Power generation and supply	34	11	45
427 & 428	Insurance	19	24	43
	All Other Sectors	501	441	943
	Total	1,679	896	2,575

Table 29: Local Total Value Added

IMPLAN Sectors	Sector Name	Direct	Indirect / Induced	Total TVA
503 & 504	State & Local Government	1,439,555	5,089,871	6,529,425
	Off-campus Housing	3,757,521	2,366,032	6,123,553
405	Grocery Stores	5,570,960	456,855	6,027,815
425 & 430	Banks & Credit Institutions	3,632,530	2,205,032	5,837,562
30	Power generation and supply	4,177,136	1,356,177	5,533,313
481	Eating & Drinking Places	4,179,370	1,007,183	5,186,553
410 & 411	Retail Stores	3,983,193	666,357	4,649,550
509	Owner-occupied dwellings	0	3,265,841	3,265,841
422	Telecommunications	2,527,764	413,537	2,941,301
407	Gasoline stations	2,591,121	191,997	2,783,118
465	Doctors & Dentists Offices	1,460,233	1,235,028	2,695,261
390	Wholesale trade	747,037	1,532,192	2,279,228
427 & 428	Insurance	1,158,306	1,037,450	2,195,756
409	Book and music stores	2,101,140	91,007	2,192,147
439	Architectural and engineering services	919,836	754,789	1,674,625
431	Real estate	372,643	1,273,519	1,646,162
433 & 478	Movie & Video Rental/Other Amusement	1,454,138	89,902	1,544,040
483	Automotive repair and maintenance	753,583	675,120	1,428,702
479	Hotels and motels	1,206,016	200,711	1,406,727
467	Hospitals	790,297	527,084	1,317,382
406	Health and personal care stores	983,179	307,223	1,290,402
436	Lessors of non-financial intangible assets	9,143	1,042,723	1,051,866
	All Other Sectors	5,369,187	10,452,177	15,821,364
	Total	49,183,890	36,237,805	85,421,694

Major Industries in Texas Affected by Tarleton State University:

As is the case at the county level, we also extracted information on output and employment for those industries which are the most impacted by the presence of the University at the state level. These industries would benefit or lose by the growth or contraction of the University. A list of these industries with their corresponding output and employment is given in Table 30 and Table 31. As noted earlier, there are many more IMPLAN sectors represented at the state level than at the county level (Erath), where only a fourth of the national set of industries is represented. The most significant

output (sales) occurred in the Banking and Credit Institutions (\$21.5 M), followed by Retail Stores (\$15.7 M), Grocery Stores (\$14.5), Eating & Drinking Places (\$13 M), Power Generation & Supply (\$11.7M) and Insurance (\$10.6M).

Table 30: Selected Industries in Texas Impacted by Tarleton State University and Related Added Employment

IMPLAN Sector	Industries	Direct	Indirect / Induced	Total Output	Total Employment
425 & 430	Banks / Credit Institutions	15,879,633	5,592,062	21,471,695	125
410 & 411	Retail Stores	13,396,371	2,259,247	15,655,618	350
405	Grocery Stores	12,602,287	1,911,287	14,513,573	289
481	Eating & Drinking Places	8,883,923	4,113,531	12,997,454	215
30	Power generation / supply	8,477,790	3,206,582	11,684,371	15
427 & 428	Insurance	5,714,493	4,871,895	10,586,388	70
390	Wholesale trade	1,351,239	8,503,844	9,855,083	62
503 & 504	State & Local Government	1,844,551	7,493,106	9,337,657	214
	Off Campus Housing	8,476,783	338,090	8,814,873	33
431	Real estate	279,161	8,136,009	8,415,170	46
407	Gasoline stations	7,203,217	602,974	7,806,191	137
509	Owner-occupied dwellings	0	7,634,806	7,634,806	0
422	Telecommunications	3,190,502	3,032,021	6,222,523	25
467	Hospitals	2,618,337	3,278,161	5,896,498	51
465	Doctor & Dentist Offices	2,806,289	2,810,185	5,616,474	57
483	Automotive repair and maintenance	2,437,896	3,087,633	5,525,529	42
	All Other Sectors	59,815,325	89,260,866	149,076,193	1435
	Total	154,977,797	156,132,299	311,110,096	3,166

In terms of jobs, the Retail sector with 350 jobs tops the list linked with the university; other major sectors include Eating & drinking Places (315), Grocery Stores (289), and State and Local Governments (215). A detailed list of the major sectors impacted by the university is given in Table 31.

Table 31: Texas Industries with Greatest Employment Impact

IMPLAN Sector	Industry	Direct	Indirect / Induced	TOTAL
410 & 411	Retail Stores	299	51	350
481	Restaurants & Bars	215	100	315
405	Grocery Stores	251	38	289
503 & 504	State & Local Government	43	172	215
407	Gasoline stations	126	11	137
425 & 430	Banks & Credit Institutions	96	29	125
427 & 428	Insurance	33	37	70
454	Employment services	6	60	66
390	Wholesale trade	9	54	63
465	Doctors & Dentists Offices	28	28	57
433 & 478	Movie & Video Rental / Other Amusement	43	11	54
467	Hospitals	23	28	51
406	Health and personal care stores	34	13	47
431	Real estate	2	45	47
483	Automotive repair and maintenance	19	23	42
	All Other Sectors	322	916	1238
	Total	1,549	1,616	3,166

VII. Intangible Benefits of Tarleton

Thus far, we have attempted to quantify the economic impact of Tarleton State University at the county and state levels and how it benefits the community and the state. However, there are several intangible benefits which although are difficult to quantify but yet should be considered and included in evaluating the overall contribution of the institution at both the local as well as state levels. While the list of these benefits is long and changing over time, a few examples are provided to illustrate the significance of the university which when combined with the tangible benefits could provide a complete picture of the role of the university. The next section offers a few examples.

1. According to the Texas Higher Education Coordinating Board, for the 2004-05 academic year, Tarleton ranks as number one in being the most affordable public four-year university in Texas for both residents and for non-residents. Given the small student-faculty ratio of 17:1 coupled with the campus located in a town designated as one of the 100 best towns in the country, Tarleton offers a great value to students in receiving quality education in a safe and nurturing environment.
2. Tarleton's Dick Smith library, which boasts a collection of nearly 1 million items, is a community resource and is available to the public not only for pleasure reading but also for academic and legal research.
3. Home to the Texas Institute for Applied Environmental Research, the study of environmental issues-particularly water quality- is available through the undergraduate Hydrology program, one of only four in the nation.
4. Tarleton also hosts the Center of Agribusiness Excellence. Funded by the United States Department of Agriculture's Risk Management Agency, it is responsible for monitoring and investigating waste, fraud, and abuse in the Federal Crop Insurance Program.
5. The W.K. Gordon Center for Industrial History of Texas in Thurber, Texas includes a research center; museum and visitors center offers a unique opportunity for the preservation, research and recording of industrial history of Texas.
6. TREAT and Psyche™ programs treats students with mobility impairments and other disabilities, as well as citizens from the area at no cost to those in need.

7. Tarleton-Erath County Special Spring Track Meet is held annually and attracts an estimated 500 special athletes from nine area counties and nearly 200 student volunteers from Tarleton.
8. Tarleton's state of the art planetarium attracts literally thousands of students in the region providing new opportunities for students to explore and enjoy outer space.
9. Innovative teacher education programs are common at Tarleton, including one of the largest and longest running public school improvement partnerships in America.
10. Tarleton provides a never-ending array of cultural, educational and entertainment programs, which are open to the community in Stephenville and through the Dora Lee Langdon Cultural & Educational Center in Granbury, Texas. From athletic events to concerts, from its art collection to attracting a diverse array of speakers, Tarleton's vision of "creating a culture of excellence for our students" extends to the surrounding communities as well.

VII. Conclusions

It is hard to measure the impact of a higher education institution and justify the existence and support that it receives in only economic terms. Since higher education is, at least in some circles, viewed as a "business," with "costs" and "returns" measured in economic terms, it may be used by administrators, legislators, and other vested interests to use economic-impact studies as a tool for bargaining, justifying, and promoting the institution. In this study, as in other studies, we have estimated the impact of Tarleton State University on the local community, as well as the state.

At the local level it was estimated that Tarleton had an economic impact of **\$170 million** representing **10.94 %** of the county's output. The university employs 840 people and supports an additional 2575 jobs for a total of **3,415 jobs** in the county. This represents almost **20%** of all the jobs in the county. The total value added (income) which Tarleton contributes to the county summed up to **\$85 million** accounting for **7.9%** of the total personal income of the county.

At the state level, Tarleton contributes **\$311 million** in output and provides (directly and indirectly) over **4,000 jobs**. Once the impacts at the county level are accounted for, the university adds \$141 million in additional output to the rest of the counties in the state and supports 591 new jobs.

Tarleton receives **\$32 million** in annual state appropriations and as noted earlier has an impact of **\$311 million** at the state level. The taxpayers are rewarded with a return of almost 10 times their "investment," measured only in the short-run. However, can one really measure the true and long run impact of Tarleton State University? To answer this question, it would entail estimating the increase in the life-time productivity of Tarleton graduates in the work-force, inventions and innovations attributed to Tarleton's alumni, and the value of lives that Tarleton graduates are saving from a biological, mental, social, and economic perspective. Besides, how can one put a dollar value to these "real" benefits to the society? Likewise, can we put a dollar value to the enrichment that Tarleton brings to the local community? How can we measure the improvement in the quality of life in the community by the presence of Tarleton? Given that Tarleton, located in rural Texas, is the only higher-educational institution within a

radius of almost fifty miles, these points take on an increased significance than in metropolitan areas where alternative choices exist.

A study of this scope obviously has limitations and weaknesses. Ideally, if resources were available, the data collection would have been spread over the entire year and more intensive follow-ups would have been made. This is especially true in estimating the visitors' impact, since the estimates of their impact were made using secondary sources and relying on the expertise and experience of departmental representatives.

Overall, we can conclude that Tarleton makes a significant economic impact on the local community and a measurable impact at the state level. The taxpayers are getting their money's worth in multiple terms.

APPENDICES

Appendix –A

TSU EMPLOYEE SURVEY FORM

As you know, TSU is in the process of estimating the economic impact of the university at the county and state levels. This is the ***third & final mailing*** of the survey. Please complete the enclosed survey by using average estimates of your family’s typical expenditures and return no later than **May, 7th, 2004**. No name or ID is asked nor are any details of expenses sought. Only summary figures will be used in the report. Mail the completed questionnaire to: Dr. H. Jafri, Box T-0920, Campus. Thank you for your cooperation.

1. Your primary position at TSU; Check one _____ Staff _____ Faculty _____ Administrator
2. Where do you live? (City/Town) _____, County _____
3. Your monthly gross income \$ _____, Your net (take-home) income \$ _____
4. Your spouse’s monthly gross income \$ _____, Net monthly income \$ _____
5. Does your spouse work for TSU? ___ Yes ___ No; If yes, only one should complete this form

ITEM:	Expenditures	Percent spent in Erath County
6. Monthly Utilities (Telephone, Electricity, Water, etc.)	\$ _____	____ %
7. a.) Monthly Food (grocery) expenditures	\$ _____	____ %
b.) Monthly expenditures in <u>restaurants, fast-food</u> , etc	\$ _____	____ %
8. Monthly Retail spending (Dept, Clothing, Specialty, etc.)	\$ _____	____ %
9. Monthly Entertainment spending (theaters, videos, clubs, etc.)	\$ _____	____ %
10. Monthly Medical costs (co-pays, dental, pharmacy, etc.)	\$ _____	____ %
11. Monthly (Ave) <u>Home-repair</u> bills (plumber, electrician, handy-man)	\$ _____	____ %
12. Monthly Insurance Premiums (Life, auto, property, etc).	\$ _____	____ %
13. Monthly Mortgage Payments (Principal & Interest) or Rent	\$ _____	____ %
14. Yearly Property Taxes	\$ _____	____ %
15. a.) Monthly Installments for autos, trucks, SUV’s)	\$ _____	____ %
b.) Monthly fuel, maintenance & repair bills	\$ _____	____ %
16. Monthly Miscellaneous spending	\$ _____	____ %
17. a.) How many friends/relatives from outside the county visit in a typical month? _____		
b.) What is their avg. length of stay? _____ Avg. daily expenditure of these visitors \$ _____		
18. Including yourself, how many family members are in your household? _____ , How many of your children attend public schools? _____		
19. Would you still reside in Erath county if you were not employed by TSU? Yes _____ No _____		

PLEASE RETURN THE COMPLETED SURVEY TO: Dr. JAFRI, BOX T- 0920, CAMPUS. THANKS.

Appendix –B

TSU STUDENT SURVEY FORM

The university is estimating the economic impact at the county and state levels. The impact includes expenditures of TSU students. Complete the following survey by using approximations of your typical monthly expenditures. Only summary figures (not individual responses) will be used in the final report. Please complete the survey even if you do not reside in the county. Thank you for your time.

1. Your status? ___ Freshman ___ Sophomore ___ Junior ___ Senior ___ Graduate Student
2. Do you live in University-Owned Housing? ___ Yes ___ No
3. If you live off-campus, where do you live? (City/Town) _____ County _____
4. Your monthly gross income \$ _____, Your net (take-home) income \$ _____
5. Are you married ___ Yes ___ No. If yes, your spouse’s monthly net income \$ _____

ITEM:	Expenditures	<u>Percent spent in Erath County</u>
6. Monthly Utilities (Telephone, Electricity, Cell, etc.)	\$ _____	_____ %
7. If you live in Univ Housing, how much do you pay in <u>Meal Plans</u> per semester	\$ _____	
8. a.) Monthly Food (grocery) expenditures (other than meal plans)	\$ _____	_____ %
b.) Monthly expenditures in <u>restaurants, fast-food, pizza, etc</u>	\$ _____	_____ %
9. Monthly Retail spending (<u>Dept. Clothing, Specialty, etc.</u>)	\$ _____	_____ %
10. Monthly Entertainment spending (theaters, videos, clubs, etc.)	\$ _____	_____ %
11. Monthly Medical costs (co-pays, dental, pharmacy, etc.)	\$ _____	_____ %
12. Monthly Insurance Premiums (Auto, property, etc)	\$ _____	_____ %
13. If you live in Univ Housing, what is the rent per semester	\$ _____	
14. If you live off-campus, your Monthly Rent	\$ _____	_____ %
15. a.) Monthly Installments for <u>autos, trucks, SUV</u>	\$ _____	_____ %
b.) Monthly gas/diesel, maintenance & repair bills	\$ _____	_____ %
16. Expenditures on <u>Books and Supplies</u> per semester	\$ _____	_____ %
17. Monthly Miscellaneous spending	\$ _____	_____ %
18. a.) How many <u>friends/relatives</u> from outside the county <u>visit</u> in a typical month? _____		
b.) What is their avg. length of stay? ___ Avg. <u>daily expenditure</u> of the visitors \$ _____		
19. Would you still reside in Erath county if you were not going to TSU? Yes ___ No ___		

PLEASE RETURN THE COMPLETED SURVEY TO YOUR INSTRUCTOR or to Dr. Jafri. Thanks!!

Appendix – C

RETIREE SURVEY

Year of retirement: _____

How long did you work for Tarleton? _____

What was your total length of service at all institutions, including Tarleton? _____

What was your last rank and position at the time of retirement? _____

Where are you currently living? City _____, State _____

Typically, how many months in a year do you live in this location? _____ months

What is your total income from all sources? _____

What are your typical total monthly living expenditures? _____

Out of these expenditures, approximately what percentage is in Erath County? _____

If you do not live in Erath county, how much, approximately, do you spend on your visits to the county annually? _____

Appendix –D

GRADUATING STUDENTS' SURVEY

Summer 2004

PLEASE ANSWER THE FOLLOWING QUESTIONS:

NUMBER OF GUESTS (RELATIVES/FRIENDS) ATTENDING GRADUATION TODAY:

A) FROM STEPHENVILLE _____

B) FROM OUT-OF-TOWN _____

C) LENGTH OF STAY IN STEPHENVILLE ____ DAYS, _____ HOURS

D) ESTIMATED AMOUNT SPENT BY YOUR GUESTS (Lodging, Food, Gifts, Gas, Shopping, etc.) IN STEPHENVILLE \$ _____

Appendix – E

Departmental Visitors			
No.	Department / Program	No. of Visitors	Expenditures
1	Athletics	11353	\$638,766
2	Total Agriculture Events	14793	\$471,197
3	Fine Arts	11672	\$380,319
4	UIL	8776	\$244,438
5	Orientation	1714	\$222,907
6	Rodeo	4800	\$190,331
7	Development Activities	1677	\$77,810
8	Total Education	1366	\$56,758
9	School Relations/Enroll. Services	3607	\$49,045
10	Total Upward Bound Projects	1578	\$48,467
11	Science & Technology	893	\$26,891
12	CAE	113	\$25,445
13	Military Science Dept	315	\$9,645
14	Career Services	204	\$8,810
15	Library	406	\$3,544
16	Student Leadership	64	\$3,224
17	Small Bus. Dev. Ctr	438	\$2,706
18	Hydrology	90	\$2,381
19	College of Grad. Studies	120	\$2,160
20	Office of Field Experience	204	\$1,796
21	President's Office	14	\$1,400
22	Social work & CJ	60	\$1,200
23	Engineer Technology	23	\$988
24	Tarleton Police Dept.	72	\$900
25	Tiaer	16	\$255
26	CITDE	13	\$117
Total Visitor Spending		64381	\$2,471,500

Note: The Expenditures reported are calculated at the county level.

Appendix – F

Tarleton Employees Gross Salaries and Head Count

	Staff	Faculty	Adm.	Part-Time	TOTAL
Local	\$9,790,606	\$9,684,571	\$4,617,713	\$410,054	\$24,502,944
Commuter	\$2,056,741	\$2,955,104	\$1,377,068	\$421,321	\$6,810,234
Total	\$11,847,347	\$12,639,675	\$5,994,781	\$831,375	\$31,313,178
Local (number)	341	175	60	48	624
Commuter(number)	74	55	20	67	216
Total:	415	230	80	115	840

Appendix – G

Analysis of Tax Implications on Income

Assumptions: Single individual, aged 25 to 64, filing single, no dependents, 2003 tax rates

Income	Standard Deduction	Personal Exemption	Taxable Income	Income Taxes	Child Tax Credit	Earned Income Credit	Net Income Taxes
\$10,000	\$4,750	\$3,050	\$2,200	\$220	0	\$96	\$124
\$12,500	\$4,750	\$3,050	\$4,700	\$468	0	0	\$468
\$15,000	\$4,750	\$3,050	\$7,200	\$726	0	0	\$726
\$17,500	\$4,750	\$3,050	\$9,700	\$1,101	0	0	\$1,101
\$20,000	\$4,750	\$3,050	\$12,200	\$1,476	0	0	\$1,476
\$25,000	\$4,750	\$3,050	\$17,200	\$2,226	0	0	\$2,226
\$30,000	\$4,750	\$3,050	\$22,200	\$2,976	0	0	\$2,976
\$35,000	\$4,750	\$3,050	\$27,200	\$3,726	0	0	\$3,726
\$40,000	\$4,750	\$3,050	\$32,200	\$4,854	0	0	\$4,854
\$45,000	\$4,750	\$3,050	\$37,200	\$6,104	0	0	\$6,104
\$50,000	\$4,750	\$3,050	\$42,200	\$7,354	0	0	\$7,354
\$60,000	\$4,750	\$3,050	\$52,200	\$9,854	0	0	\$9,854
\$70,000	\$4,750	\$3,050	\$62,200	\$12,354	0	0	\$12,354

Prepared by Patricia E. Smith, CPA, Assistant Professor

Analysis of Tax Implications on Income

Assumptions: Single individual, ages 25 to 64, filing head of household, two children under age 17

Income	Standard Deduction	Personal Exemption	Taxable Income	Income Taxes	Child Tax Credit	Earned Income Credit	Net Income Taxes
\$10,000	\$7,000	\$9,150	(\$6,150)	0	\$765	\$3,990	(\$4,755)
\$12,500	\$7,000	\$9,150	(\$3,650)	0	\$956	\$4,204	(\$5,160)
\$15,000	\$7,000	\$9,150	(\$1,150)	0	\$1,148	\$3,942	(\$5,090)
\$17,500	\$7,000	\$9,150	\$1,350	\$134	\$1,473	\$3,415	(\$4,754)
\$20,000	\$7,000	\$9,150	\$3,850	\$378	\$1,908	\$2,889	(\$4,419)
\$25,000	\$7,000	\$9,150	\$8,850	\$883	\$2,000	\$1,836	(\$2,953)
\$30,000	\$7,000	\$9,150	\$13,850	\$1,574	\$2,000	\$783	(\$1,209)
\$35,000	\$7,000	\$9,150	\$18,850	\$2,324	\$2,000	\$0	\$324
\$40,000	\$7,000	\$9,150	\$23,850	\$3,074	\$2,000	\$0	\$1,074
\$45,000	\$7,000	\$9,150	\$28,850	\$3,824	\$2,000	\$0	\$1,824
\$50,000	\$7,000	\$9,150	\$33,850	\$4,574	\$2,000	\$0	\$2,574
\$60,000	\$7,000	\$9,150	\$43,850	\$6,651	\$2,000	\$0	\$4,651
\$70,000	\$7,000	\$9,150	\$53,850	\$9,152	\$2,000	\$0	\$7,152

Net income taxes denoted as negative indicates a refund as a result of child tax credits and earned income credits

References

- Beaty, William L., Gary D. Lewis, and James R. Smith, (1995), "An Impact of Tarleton State University," Stephenville, TX., Mimeo
- Beck, Roger , et.al (1993). "The Economic Impact of Southern Illinois University." Carbondale, IL., Mimeo
- Business and Industry Data Center.Erath County.17 Sept.2004
<<http://www.bidc.state.tx.us/coutyprofiles/Erath.pdf>>
- Caffrey John and Herbert H. Issacs, (1971), *Estimating the Impact of a College or University on the Local Economy*, American Council of Education, Washington, DC
- City of Stephenville, Texas. Community Profile.17 Sept.2004
<<http://www.ci.stephenville.tx.us>>
- Field, Barry C., and Selene Weber. (1996) "The Economic Impact of the University of Massachusetts on the Economy of Massachusetts," Amherst, MA. Mimeo
- Garbo, Lorenzo."Wassily Leontief, The Founder of Input-Output Analysis and the Laureate of 1972." Frontiers of Economics: Noble Laureates of the Twentieth Century. Abu N.M.Wahid (editor). Greenwood Press. Westport,CT. (2002).
- Hobijn, Bart and David Lagakos. (2003)"Social Security and the Consumer Price Index." Current Issues in Economics and Finance.<http://www.newyorkfed.org/research/current_issues/ci9-5.html>
- Jafri, S. Hussain Ali, Jay Dudley, and David Buland (2000), "Economic Impact of Tarleton State University"< <http://www.tarleton.edu/main/economic.pdf>>
- Martin, Fernand and Marc Trudeau.(1998). "The Economic Impact of University Research." Reseach File. <http://www.aucc.ca/_pdf/english/publications/researchfile/1997-98/vol2n3_e.pdf>
- Minnesota IMPLAN Group, Inc., IMPLAN Professional v2.0, Social Accounting & Impact Analysis Software, User's Guide, Analysis Guide, Data Guide, Stillwater, MN:1999, <http://www.mig-inc.com/>
- Rubin, Rose M. and Micheal Nieswiadomy. "Expenditure Patterns of Retired and Nonretired Persons." Monthly Labor Review April 1994.<<http://www.bls.gov/opub/mlr/1994/04/art2full.pdf>>
- Sam Houston State University."The Economic Impact of Sam Houston State University"<http://coba.shsu.edu/cbr/documents/EconomicImpactFinalReport4.pdf>

Texas A&M University- Corpus Christi. (1998). "The Economic Impact of Texas A&M University- Corpus Christi on the Corpus Christi Metropolitan Statistical Area."<
<http://pie.tamucc.edu/reports/econ98.doc>>

Texas Economic Development.Texas Community Profiles, Texas Communities: Stephenville. Jan.2001. 1 Sept. 2004<<http://community.tded.state.tx.us/communities/commpages/983.htm>>

Texas Workforce Commission. Texas Adds 116,000 Jobs Over the Year, Unemployment Rate Holds Steady. Sept. 2004. 27 Sept.2004
<<http://www.twc.state.tx.us/news/press/2004/091604epress.html>>

University of Colorado, (2000). "A Sound Investment in Colorado."
<<http://www.cu.edu/cuimpact/economic/ecimpact00.pdf>>

University of Waterloo. (2001). "Regional Economic Benefits Study."
<http://www.uwaterloo.ca/documents/pdf/PWC_report.pdf>

Virginia Commonwealth University, (1992). The Impact of Virginia Commonwealth University, Richmond, VA

Weisbrod, Glen and Burton Weisbrod. (1997) "Measuring Economic Impacts of Projects and Programs." Economic Development Research Group
<<http://www.edrgroup.com/pages/pdf/Econ-Impact-Primer.pdf>>

U.S. Department of Labor and Bureau of Labor Statistics. "Consumer Expenditures in 2002." Report 974 Feb 2004.<<http://www.bls.gov/cex/csxann02.pdf>>