



TEXAS TECH UNIVERSITY™

The Economic Impacts of
Texas Tech University





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Prepared by:

Bradley T. Ewing, Ph.D.
Rawls Professor of Operations Management
Texas Tech University
Rawls College of Business
(806) 742-3939
bradley.ewing@ttu.edu

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Executive Summary

The main campus of Texas Tech University operates in Lubbock, Texas. The university currently enrolls over 28,000 students and plans to increase that number to 40,000 by the year 2020. The school has also set its sights on becoming the next national research university in the state and is on the verge of attaining Tier One status.

This study provides estimates of the economic impact of Texas Tech University on Lubbock County in the year 2009. In addition to the ongoing operations and payroll impacts of the university, the specific impacts of university research, student spending, visitor-related spending, and additional spending by fans attending Red Raider home football games are provided. The study also highlights the annual workforce contribution for the State of Texas from the graduates of Texas Tech University.

The Current Impact of Texas Tech University on the Lubbock Economy

- Texas Tech University operations, employees, students and visitors, currently generate a total economic impact of \$1.26 billion per year for Lubbock County
- Texas Tech University helps sustain nearly 15,000 jobs in Lubbock County annually
- The economic impact of Texas Tech University includes an annual household earnings impact of nearly \$612 million
- Texas Tech University students spend money locally and contribute to the economic impact of the university. The share of total impacts attributed to student spending is:
 - \$294 million in economic output
 - \$80 million in household income
 - 3,261 jobs
- Texas Tech University visitor-related spending contributes to the economic impact of the university. The share of total impacts attributed to non-athletic visitor-related spending is:
 - \$87 million in economic output
 - \$28 million in household income
 - 1,162 jobs
- Texas Tech University home football games contribute to the economic impact of the university. The share of total impacts attributed to additional spending in the economy that would not otherwise occur is:
 - \$43 million in economic output or \$6.16 million per home game
 - \$14 million in household income or \$1.97 million per home game
 - 576 jobs or 82 jobs for each home game
- Texas Tech University research expenditures contribute to the economic impact of the university. The share of total impacts attributed to research activity:
 - \$155 million in economic output
 - \$69 million in household income
 - 1,318 jobs

The additional spending from every 1,000 new students leads to annual local impacts of:

- Over 100 jobs created or sustained in Lubbock County
- \$2.67 million in household income
- \$9.8 million in output



Reaching the 2010 target of \$110 million in research expenditures means more jobs and economic activity in Lubbock County:

- Total output increases by more than \$38.7 million
- Household income increases by \$17.27 million
- Total employment increases by 329 jobs

Research conducted by Texas Tech University faculty and students has state-wide economic impacts:

- Nearly 1,400 jobs created or sustained in the State of Texas

- Nearly \$74 million in Texas household income
- Over \$170 million in Texas output

Graduates of Texas Tech University add annually to the stock of human capital and skilled workforce in Texas and provide economic value to the Texas economy:

- The annual contribution to the Texas workforce by graduates of Texas Tech University is \$3.26 billion



Introduction

Texas Tech University is one of the largest universities in Texas and enrolls more than 30,000 students at its main campus in Lubbock. Serving as a major economic engine in Lubbock County and beyond, the university has over 1,500 faculty, more than 4,400 staff, and employs many part-time temp and student workers.

Recently, Texas Tech began a journey to become the next Tier One university in the state, and is on the verge of qualifying for the National Research University Fund which will provide a significant amount of state funding for research in the years to come. Achieving Tier One status will have a transformative effect on the university, raising the value of every degree awarded and the national profile of Texas Tech.

Along with reaching this designation, Texas Tech must continue to aggressively increase enrollment, specifically at the graduate level. Under the leadership of President Guy Bailey, Texas Tech is committed to the System's vision of increasing enrollment to 40,000 students by the year 2020. This vision would bring nearly 10,000 more students to Texas Tech in the next 10 years, growing student enrollment by approximately 25 percent.

Taken together, the Texas Tech University enterprise is a powerful and substantial economic force, both in the Lubbock area and across the State of Texas. University expenditures on educational and administrative services, research, building supplies, equipment, maintenance, repair and construction as well as spending by Texas Tech University employees, students, and visitors generates enormous economic impacts for the area. Moreover, with a larger student body and enhancements in research and development, these impacts will grow substantially larger over time.

History

Texas Tech University was created by legislative action in 1923 under the leadership of Gov. Pat Neff. Committed to its founding principles, Texas Tech prides itself on being a major research university that retains the atmosphere of a smaller liberal arts institution.

Originally named Texas Technological College, the institution opened in 1925 with six buildings and an enrollment of 914 students. By action of the Texas State Legislature, Texas Technological College formally became Texas Tech University on September 1, 1969. More than 85 years later, Texas Tech has grown from the initial five schools into a comprehensive university with 11 academic colleges, a graduate school and a school of law. As a member of the National Collegiate Athletic Association, Texas Tech began competing in the Big 12 Conference in 1996 after a 35-year membership in the former Southwest Conference.



Purpose of this Study

The purpose of this study is to estimate the economic impact of Texas Tech University's main campus on the Lubbock economy. In addition to the operational impacts of the university, this study sheds light on the impacts associated with research expenditures, student spending, university visitor-related spending, and additional expenditures associated with Red Raider home football games. Special features of this study include a multi-regional analysis of research expenditures that captures the cascading effects of Texas Tech University on the economy of the entire state, a dynamic analysis of research investment that provides the return that can be expected on additional research dollars, and an analysis of the workforce contribution that Texas Tech University graduates make to the State of Texas on an annual basis.

For purposes of determining the economic impact of Texas Tech University on the Lubbock area, the study is limited to Lubbock County. To the extent that Texas Tech University operates (i.e., hires employees from Austin or Dallas, etc.) and purchases goods and services outside this region, the results of this analysis may be understated.

Lubbock County

Lubbock County is situated in West Texas in an area commonly referred to as the South Plains. The county covers approximately 900 square miles. The county has an estimated 2009 population of 270,550. The county is comprised of nearly 108,000 households and the median household income is over \$44,000 (est. 2009) although roughly 17 percent of the residents live below the poverty line. Total personal income exceeds \$8.4 billion (est. 2009).

The population of Lubbock County is fairly well-educated, which is not surprising given it is home to a major teaching and research university as well

as several other small 2- and 4-year colleges. In fact, 78 percent of the population over the age of 25 are high school graduates, while over 24 percent of the population holds a Bachelor's degree or higher. Lubbock features a diverse economic environment with over 157,000 persons employed in the county and 241 distinct industrial sectors (NAICS) represented in the economy.

The Ongoing Operations of Texas Tech University

The organization's operating budget was examined in order to determine the economic impact of Texas Tech University. These expenses included payroll and employee benefits as well as expenditures on supplies, purchased services, and other items. Moreover, Texas Tech University is an enterprise that is continuously maintaining, renovating, and adding new facilities and physical capital on a yearly basis. In any given year, Texas Tech University has significant capital needs and spends accordingly. The economic impact analysis is premised on both standard operating expenses, including payroll, and capital spending. The university divides the operating budget into four main categories or funds: educational & general, auxiliary, current restricted, and designated. According to the Texas Tech University, Summary Operating Budget for Fiscal Year 2009, these funds total \$601,827,015. Of this amount, approximately \$88 million constitutes research expenditures.

Texas Tech University's main campus employs nearly 6,000 faculty and staff and payroll (i.e., wages and salaries) accounts for well over 40 percent of the operating budget. In 2008 there were 1,540 faculty and 4,433 staff. Additionally, the university employs many part-time temporary and student workers. The expenditures made by Texas Tech University faculty and staff on goods and services, housing, and other items provide a significant contribution to the Lubbock economy.


Primary Impacts of Texas Tech University Operations, Employees and Research

TTU Employees (faculty and staff)	5,973
TTU Expenditures	\$601,827,015

Secondary Impacts from Texas Tech University Operations, Employees and Research

Jobs		3,767
Household Income		\$222,274,936
Output		\$209,249,433

Sub-Total: Impacts of Texas Tech University Operations, Employees and Research

Jobs		9,740
Household Income		\$490,274,936
Output		\$811,076,448



Texas Tech Students and Local Spending

Texas Tech University's main campus enrolls over 30,000 students. Of this amount close to 7,000 students reside on-campus while 23,067 live off-campus. Moreover, an estimated 7,596 students list their permanent residence within a 100 mile radius of Lubbock (referred to as "within region" students) and 22,453 are from outside the local region.

In terms of local economic impact, only the spending by non-local students adds directly to the economic base of Lubbock County. This is because local students would presumably live and spend their money here anyway. Of course, to the extent that local students remain in the area and attend Texas Tech instead of another out-of-region college (e.g., Texas A&M University, University of Texas, University of Houston), then their not leaving the county reduces the "leakage" of income to other areas and effectively works in favor of the Lubbock economy. Furthermore, only expenses on such things as room

and board, transportation, books and supplies, and other personal expenses are included in the economic impact of student spending (i.e., tuition and fees, a significant cost of obtaining an education, are already included in the education and general funds of the operating budget of the university).

The College Board provides estimates of expenses for students at public 4-year colleges in the Southwest. Over the typical school year, the average student spends \$13,454 (est. 2009) beyond tuition and fees. Texas Tech students are projected to spend nearly \$264 million in Lubbock during the 2009-10 academic and summer terms. To some degree, student spending in 2009 was probably affected by the recent recessionary economy. While Lubbock County fared reasonably well during this downturn, the spending patterns of many out-of-region students may have been more economical than in periods of economic expansion.

Impacts from Texas Tech University Student Spending

Jobs		3,261
Household Income		\$80,316,368
Output		\$294,207,008

These estimates have important implications for the future enrollment goals of the university as they indicate the additional spending from every 1,000 new students leads to annual local impacts of over 100 jobs created or sustained, \$2.67 million in household income and nearly \$10 million in output.

Texas Tech University Visitor-Related Spending

Texas Tech University attracts thousands of visitors each year who come for a variety of events including concerts, reunions, museum, athletics and art performances. Additionally, many university programs, colleges and departments attract visitors to participate in interviews, campus tours, enrollment programs, and to accompany students to campus and attend graduation ceremonies. The campus is also host to many conferences, outreach programs and other university-sponsored activities. Many of these visitors are from out of town and stay in local hotels and motels, dine in local restaurants, and make purchases at many retail establishments.

It is estimated that university visitor-related spending amounted to \$57.5 million in 2009 (excluding the additional spending by fans attending Red Raider home football games). The largest portion of this spending is attributed to student visitors and parent activities (\$33 million), followed by faculty and staff visitors (\$17.5 million), and college/university activities whose visitors travel expenses were not covered by university funds (\$7 million).

Impacts from Texas Tech University (non-football) Visitor-related Spending

Jobs		1,162
Household Income		\$27,824,348
Output		\$87,141,952

Additional Expenditures Associated with Fans Attending Red Raider Home Football Games

The Red Raider football team played 7 home games in the 2009 season. Total game attendance exceeded 350,000. The Red Raider and visiting team fans generate substantial net economic impacts in Lubbock County. The net impact represents new economic activity directly or indirectly associated with attendance at Red Raider home football games. In particular, it is the additional spending by fans, above and beyond what they may have spent in the local area had there not been a home football, that leads to new economic impacts. In order to calculate an estimate of the net economic impact,

and to exclude that portion of football game-related economic activity that simply displaces other economic activity in the area, certain adjustments are made. Specifically, attendees are assumed to fall into one of the following three categories: in-region non-student, in-region student, and out-of-region. Expenditures using nationally available study data from NCAA/BCS conference teams are applied to the Texas Tech Red Raider attendance figures. Total direct expenditures by fans attending Red Raider home football games over the 2009 season are estimated at \$22.7 million.



Impacts from Additional Red Raider Home Football Game Spending

Jobs		576
Household Income		\$13,771,008
Output		\$43,133,350

Alternatively, the economic impacts associated with the additional spending by fans attending home football games in Lubbock may be expressed on a per game basis. Viewed in this manner, there is \$6.16 million in output, \$1.97 million in household income, and 82 jobs created or sustained per home Red Raider football game.





The total operating budget of Texas Tech University includes total research expenditures of \$88 million in 2009. These research dollars are a particular type of investment that, while stimulating the local economy, have both immediate impacts as well as longer lasting impacts. This section provides detailed estimates of the economic impact of Texas Tech University's current R&D endeavors on the Lubbock economy and the farther-reaching or cascading effects that these expenditures have on the state-wide Texas economy. Given the goal of attaining Tier One status, the additional impacts of reaching the 2010 goal of \$110 million of research expenditures (i.e., a \$22 million increase in research expenditures) is also estimated.

Finally, this section provides a measure of the return on these investment dollars over a longer time

horizon to more fully capture the dynamic nature of university research and development. In particular, the university has set targets of \$150 and \$200 million in research expenditures for the years 2015 and 2020, respectively. For purposes of this study, it is conservatively assumed that research has a 10 year life-cycle, although the literature on the effects of university research suggests that number may actually be 10 years or more.

In order to analyze the impact of increased research investment in terms of real output for the State of Texas the annual average compound rate of return is computed. Assuming a 5 percent discount rate (i.e., the interest that could be earned on alternative investment of funds), the annual average compound real return on a research dollar over the 2011 – 2020 horizon is estimated to yield 26.88 percent.



Current Impacts from Texas Tech University Research on the Lubbock Area

Jobs		1,318
Household Income		\$69,382,712
Output		\$154,954,528

Current Impacts from Texas Tech University Research on the State of Texas

Jobs		1,397
Household Income		\$73,935,634
Output		\$170,935,634

Additional Local Impacts from Reaching the Texas Tech University Target Level for Research Expenditures for the year 2010 (i.e., a \$22 million increase over 2009 expenditures)

Jobs		176
Household Income		\$17,265,600
Output		\$38,380,633

Annual Average Compound Real Return on Research Expenditures

Return on Research Investment	26.88%
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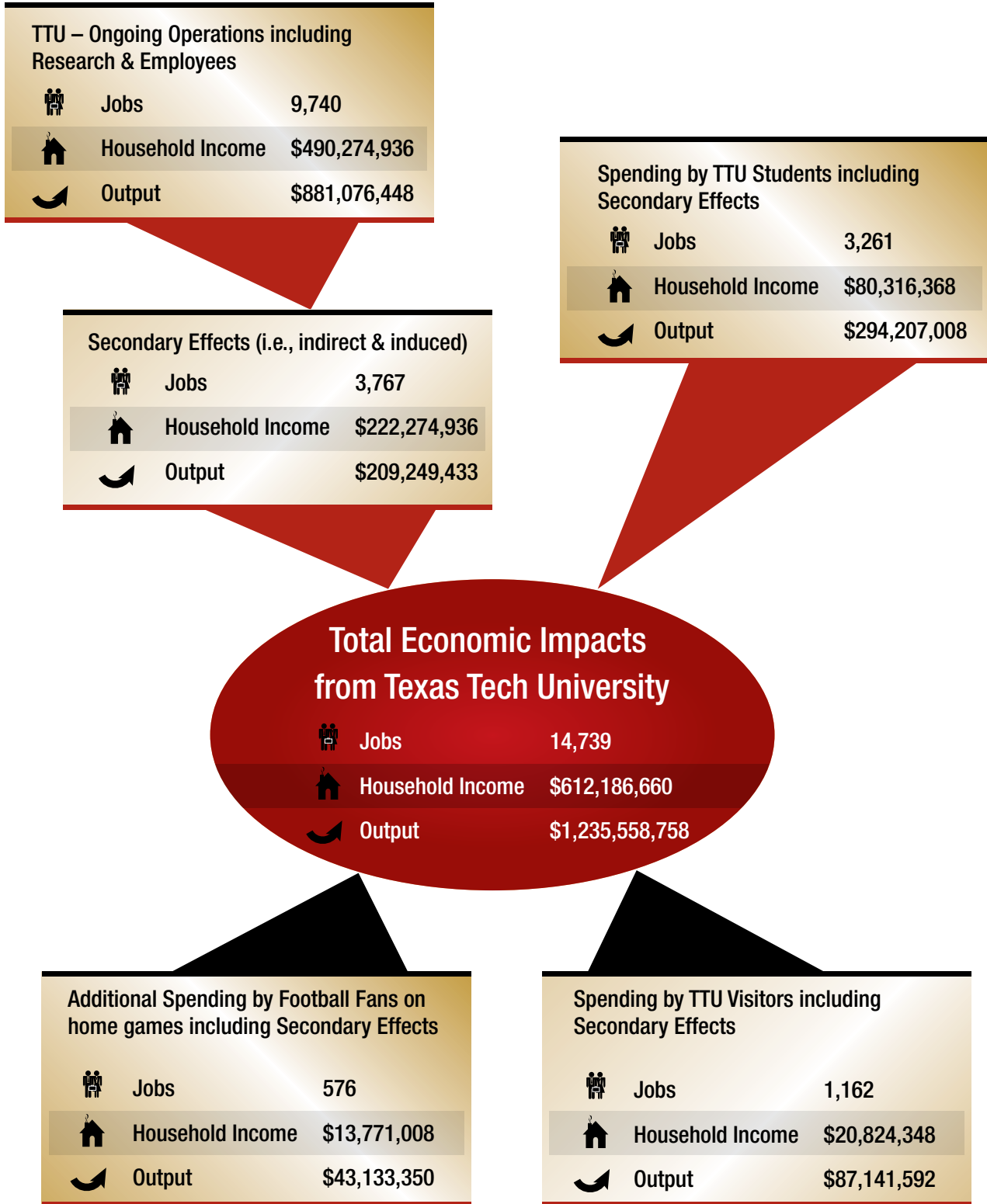
Summary of Economic Impacts of Texas Tech University on Lubbock County Economy in 2009

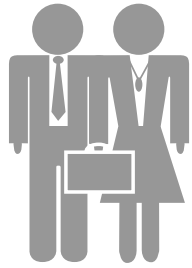
The total economic impact of Texas Tech University on the Lubbock area economy is comprised of the local impacts from ongoing operations, payroll and employment, research expenditures, spending by students and university-related visitors, and the additional spending of fans attending Red Raider home football games. In all, the direct and secondary economic impacts associated with the Texas Tech University enterprise account for 9.35 percent of total employed persons and 7.28 percent of total personal income in the county. Moreover, the amount of total output that arises as a result of Texas Tech University amounts to nearly 13 percent of Lubbock County's Gross Regional Product.

Total Impacts of Texas Tech University Operations, Employees, Research, Students, University-related Visitors, and Red Raider Home Football Games

Jobs		14,739
Household Income		\$612,186,660
Output		\$1,235,558,758

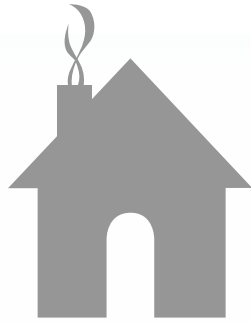
The accompanying schematic diagram illustrates these impacts and highlights the components that comprise the local economic impacts of Texas Tech University.





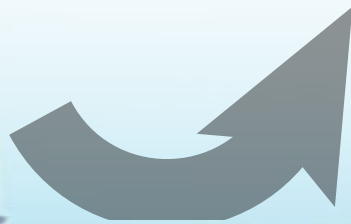
Employment

Texas Tech University's main campus employs nearly 6,000 faculty and staff. The amount of spending by the university as well as the spending by Texas Tech University employees and students on goods and services sustains more than 14,700 jobs in the Lubbock economy. All told, this represents 9.4 percent of the total employment in the county.



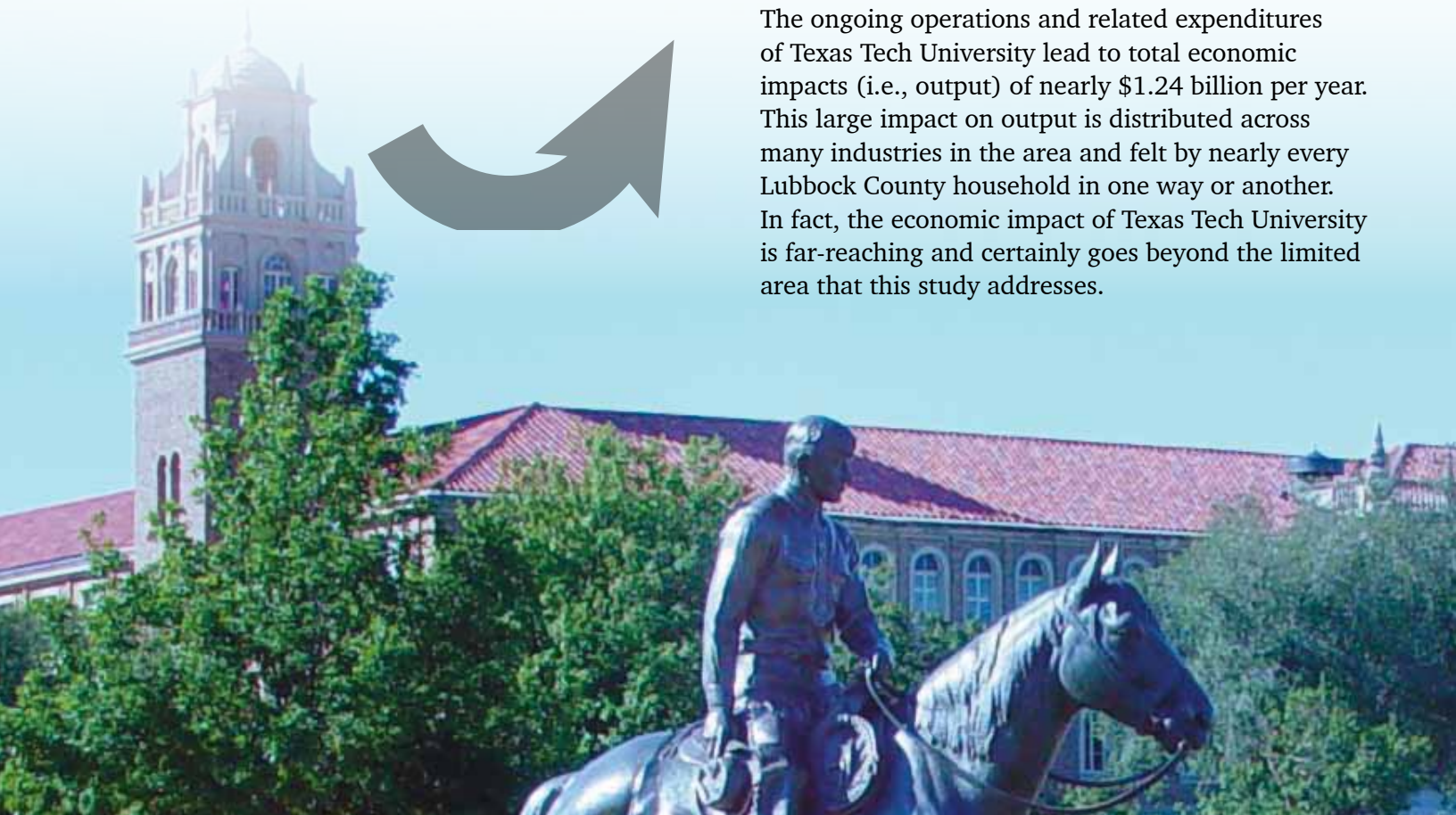
Household Income

Of the total economic activity generated by Texas Tech University, over \$612 million is in the form of household income to the citizens of Lubbock County. This impact alone accounts for over 7 percent of the total personal income in the county. More importantly, this impact is on an annual basis and growing each and every year.



Output

The ongoing operations and related expenditures of Texas Tech University lead to total economic impacts (i.e., output) of nearly \$1.24 billion per year. This large impact on output is distributed across many industries in the area and felt by nearly every Lubbock County household in one way or another. In fact, the economic impact of Texas Tech University is far-reaching and certainly goes beyond the limited area that this study addresses.



Texas Tech University's Skilled Workforce Contribution

The education that Texas Tech University provides students adds annually to the overall human capital and earning power of the workforce. Economic studies have documented the differences in income earning potential of various degree attainment levels, particularly as compared to workers with only a high-school degree or equivalent. According to Kantrowitz (2007), these income differentials measured in lifetime earnings are substantial. The accompanying table shows how much more a person with a university degree earns over their lifetime than a person with just a high school degree earns over their lifetime. The income differences are shown in present dollars (i.e., inflation effects have been removed):

Degree Attained	Lifetime Income Difference Between Highest Degree Attained and a High School Degree (<i>\$ million, today's dollars</i>)
Professional (e.g., MD, JD)	\$4.08
Doctoral (e.g., Ph.D., Ed.D.)	\$2.92
Master's	\$1.81
Baccalaureate	\$1.21

Lifetime earnings differences are used to estimate the economic value of Texas Tech University's contributions to the Texas workforce. The economic value is based on the number of graduates in a year (i.e., 2009), by degree attained, and the corresponding lifetime earnings difference with two adjustments. First, for purposes of this study, it is assumed that 75 percent of Texas Tech University graduates remain and work in the State of Texas. Labor economists have determined that a large share of the earnings difference between those with university degrees and those without is attributable to self-selection bias and/or various unobservables such as drive, motivation, natural ability, etc. Thus, a second adjustment is made such that only 50 percent of the earnings differences of those graduates remaining in Texas is attributable to the education received at Texas Tech University. In a further attempt to be as conservative as possible, the economic value of workforce contribution does not contain a multiplier.

The annual contribution to the Texas workforce from the graduates of Texas Tech University is estimated to be \$3.26 billion. Clearly, the impact of an educated population and workforce may be the single most important benefit that an institution of higher education may provide.



Summary of Economic Impacts of Texas Tech University on Lubbock County Economy, 2009



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Output		\$1,235,558,758



Texas Tech University is the largest employer in Lubbock County. The volume of spending by Texas Tech University faculty and staff sustains numerous jobs in the area. Moreover, many Texas Tech University employees have relocated to Lubbock specifically to work at the University. This in-migration of individuals from other areas works to strengthen the local economy. While Texas Tech University's main campus operates in Lubbock, nearly 80 percent of the students are from outside the region.

In economic terms, Texas Tech University is referred to as an export industry, that is, Texas Tech University generates revenues from students outside the greater Lubbock region. These students, by choosing the educational services and opportunities provided by Texas Tech University, direct revenues into the Lubbock area instead of, for example, Austin, Dallas, Houston or elsewhere. This new money in the local economy acts to reinforce Texas Tech University's role as a driver of economic growth and helps to sustain the economic activity of the region. Texas Tech students generate substantial economic benefits to the people and business owners who live and work within the Lubbock area.

Adding to the positive economic benefits that students who reside outside of the region provide to the Lubbock area, is that many local college students decide to attend Texas Tech, thus keeping dollars in the area instead of "leaking" out to other cities (e.g., Austin, Dallas, Houston, etc.).

There are many other benefits that Texas Tech University bestows on the Lubbock area and, indeed, on the State of Texas and beyond. Most importantly, economists have documented the relationship between education and earnings, productivity, health, and longevity. By providing higher educational and related services to persons in West Texas, Texas and beyond, the levels of educational attainment, work force success, overall societal welfare and standard of living are higher than they

would be otherwise. The economic value of Texas Tech University's contribution to the workforce may have the largest impact of any other activity on the state economy.

Texas Tech research and development efforts create new products and processes that can be used in industry, medicine and public service. R&D of the faculty and students develops new intellectual property, knowledge and innovation. Breakthroughs in science, human and social networks, etc. often lead to knowledge-based industrial clusters that can provide substantial economic opportunity to a region. The economic impacts of university research are felt in Lubbock and across the Lone Star state. Moreover, given that research has a multi-year life-cycle, the annual return on research investment is considerable and makes economic sense.

Texas Tech also impacts the community and local economy in other ways. For example, Texas Tech University draws spectators for athletic events, such as Red Raider football games, and audiences for cultural events and graduation ceremonies. Parents, family and friends come to Lubbock to visit students, faculty and staff while many college and university departments host events and activities that draw visitors from many places. The spending during these campus visits by out of town persons or by people that would otherwise have decided to stay home that day constitute another avenue for generating economic impacts in Lubbock. Additionally, Texas Tech offers a number of cultural and educational programs, as well as facilities, to the public and thus provides intangible benefits that improve the quality of life of those in the local community.

Clearly, a substantially larger university, with more students, staff and faculty, and a more prominent research presence provides enormous growth potential and will help maintain a sustainable economic environment in which Lubbock area businesses, households, and citizenry can prosper.

In order to support Texas Tech University's mission of providing higher education and related services to the citizens of Texas and beyond, a number of expenditures are made that impact the local economy. The economic impact of Texas Tech University is measured from spending on payrolls, operating expenses, and capital spending (e.g., construction projects), which in turn generate jobs and income in the Lubbock regional economy. Additionally, a large number of students from outside the immediate region attend Texas Tech University. While attending school, these students live and spend money in Lubbock which generates jobs and income in the Lubbock regional economy. This report provides a measure of the contribution that Texas Tech University has on the local economy. Results from this study should be of interest to state and local policymakers, citizens, and business people and may be used to further the economic development of Lubbock.

A regional economic model, referred to as an input-output (I-O) model by economists, was constructed to measure the economic impact that Texas Tech University has on the Lubbock economy. The basis of the model is the spending patterns of individuals and businesses in the region. In particular, expenditures by Texas Tech University on equipment and supplies occur within the region and elsewhere, while Texas Tech University faculty and staff tend to spend the majority of their income locally. Economists generally categorize the economic impacts from these expenditures into two types of effects: direct and secondary. Direct effects represent those expenditures within the region of the institution, that is, Texas Tech University. Direct effects lead to secondary effects in the form of business-to-business

transactions in the region (e.g., to restore inventory) and also to new income in the form of wages and salaries, rent and interest payments, payments to proprietors and stockholders for investment, etc.

The regional economic model identifies the "linkages" within the economy that exist between businesses (or enterprises) and other businesses, and businesses (or enterprises) and final consumers. From the regional economic model, a set of industrial sector "economic multipliers" unique to the regional economy are calculated. These multipliers are used to provide a comprehensive assessment of the local economic impact of Texas Tech University. Specifically, the economic impact analysis provides information as to the number of jobs created and sustained by the ongoing operation of Texas Tech University, the income added to the local economy from Texas Tech University's operations, which includes household income or earnings, and the total output (in dollars) that Texas Tech University contributes to the local economy.

An extension of the standard regional economic model is the multi-regional input-output model (MRIO). The MRIO is used for estimating the state-wide effects of research expenditures as investment in research and development typically has a broader impact than do other ongoing operational expenditures of a university. In particular, university research has been linked to the knowledge economy and may transfer to industry and other sectors of the economy rapidly and smoothly, thus creating growth in others areas of the state in addition to the local area. The MRIO captures the inter-dependencies of this intricate and complex supply chain through data on inter-regional transactions.



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