TEXAS TECH UNIVERSITY

School *of* Veterinary Medicine™

Report on the Feasibility of a School of Veterinary Medicine

May 2018

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Report on the Feasibility of a School of Veterinary Medicine Texas Tech University

1. Executive Summary

After decades discussing the growing needs for veterinary services and veterinary education in Texas, and a 2016 Texas Higher Education Coordinating Board (THECB) report recommending consideration of an innovative cost-efficient, non-duplicative model of veterinary education, the 85th Texas Legislature appropriated $4.17 million to Texas Tech University (TTU) for veterinary medicine. As a result of a detailed needs assessment and research of innovative approaches to medical education, TTU developed an academic plan and business model incorporating and adapting relevant aspects from the Texas Tech University Health Sciences Center (TTUHSC) and the University of Calgary Faculty of Veterinary Medicine (UCVM).

The proposed plan for the TTU School of Veterinary Medicine (SVM) has been designed specifically to address the goals resulting from the needs assessment:

- Produce veterinarians who work with the livestock and wildlife industries, and agricultural communities across Texas;
- Support livestock industries as they feed a growing population;
- Improve human, animal and ecosystem health by integrating One Health activities across education, research and service;
- Improve affordability and access to a world-class education; and
- Train veterinarians that are equipped to treat the needs of large animals and serve agricultural and small communities where concentrated livestock populations reside.

An assessment of the feasibility of this plan was conducted. It is clear the diverse veterinary medical needs of Texas, its animals and its citizens have expanded beyond the capacity that any one institution can meet. Key findings of the feasibility assessment are:

a. Persistent Workforce Need: Workforce demands in Texas have far exceeded the capacity of the sole existing veterinary medical program in Texas. Moreover, Texas is now overwhelmingly dependent on institutions – and increasingly private institutions – located out of state and country to meet its workforce demand. The veterinary job market is expected to grow at more the double the rate of other professions according to the BLS. Moreover, the THECB has invited a proposal for an innovative new veterinary program to address a growing workforce shortage. Sufficient workforce demand exists to employ graduates of a new veterinary medical program at TTU.

Sufficient workforce demand exists to employ graduates of a new veterinary medical program at TTU.

b. Educational Demand: Texas's sole existing veterinary medical education program is at capacity and, consequently, turns away several-fold more qualified applicants than it can enroll. Moreover, because of lack of alternative veterinary medical educational options in Texas, more and more students are forced to enroll in out-of-state and out-of-country programs with an increasing reliance on private institutions. In effect, Texas is exporting its citizens to provide an economic impact elsewhere. If these students return to Texas, they typically return with substantial educational debt.

Sufficient demand for education exists in Texas to support a new veterinary medical program at TTU.

c. Academic Program: The proposed TTU SVM adapts from a fully accredited and highly successful program and utilizes existing strengths of TTU Health Sciences Center and TTU's College of Agricultural Sciences and Natural Resources. Furthermore, in following the recommendation from the THECB, the proposed school is not duplicative of the existing program within the state and is designed specifically to address the needs identified in the workforce and educational demand assessments and the needs articulated by the THECB.

The proposed TTU SVM is academically feasible.

d. Assessment of Philanthropic Opportunities: There is sufficient philanthropic support and intent to fund the facilities and, in time, to support student scholarships and other areas.

e. Facility Requirements:The hybrid distributive model developed by UCVM offers substantial facility cost reductions compared to the infrastructure needed to support a traditional model. Initial FP&C estimates place the facilities cost at approximately $90 million.

The facilities needed to support the proposed TTU SVM are financially feasible given the goal to raise commitments to support its construction is achieved.

f. Operational Budget: The budget was designed to build the program in conjunction with the timeline for accreditation and provide for sufficient faculty and support so that TTU can meet the 11 standards of accreditation within its chosen model of education. The budget is sufficient to provide for a self-supporting academic unit that provides its fair-share of financial contribution to support centralized shared services and includes sufficient faculty to support both the professional program and graduate students.

The proposed TTU SVM is financially feasible.

2. Historical Perspective

Agriculture and the State of Texas

Under its many flags, Texas has been inextricably linked to animal agriculture. From the Spanish introduction of domesticated cattle, to the iconic ranches in the west and the poultry pioneers in the east, to today's modern dairy, beef, pork and poultry producers, animal agriculture has been – and remains – part of the state's founding fabric and economic prosperity.

However, with animal agriculture came animal disease. This year marks the 125th anniversary of the Texas Animal Health Commission (TAHC). It was created to protect agricultural animals from "all contagious or infectious diseases of a malignant character" (Appendix A). At the time of establishment, fever tick was a curse across Texas and many other livestock-dependent states and territories (Appendix B). Fever ticks were devastating and posed a tremendous burden on the economy of Texas; solving the epidemic was the first priority of the TAHC. Other diseases, such as tuberculosis – a zoonotic disease that can kill both cattle and humans – became new targets for the TAHC.

At that time, Texas was dependent on other states for its veterinarians. The need for enhancing veterinary medical care was paramount. In 1903, the Texas Veterinary Medical Association (TVMA) was founded by Dr. Mark Francis to improve veterinary care and provide continuing education (Appendix C). Later, Dr. Francis helped found the College of Veterinary Medicine at Texas A&M University and became its founding dean in 1916. Texas – as is the nature and tradition of the state – invested to provide a homegrown solution to a critical issue, rather than continuing to rely on other states.

Today, animal agriculture has grown into a $15 billion per year economic driver for Texas. The state leads the nation in cattle, sheep, goats and mohair production and has the highest number of food and fiber animals in the U.S. Texas boasts more than 248,000 ranches and farms and has the highest number of cattle in feedlots in the U.S. Much of the oil and gas in Texas is produced from reservoirs deep beneath ranching operations. In many respects, the food, fiber and fuel that Texans, the nation and much of the world relies on is tied to animal agriculture in Texas. Yet animal disease continues to shape animal agriculture and affect local economies. Outbreaks of tuberculosis in dairies that made up the El Paso milk shed in the 1990s led to Texas losing its tuberculosis-free status in the early 2000s and to the shuttering of a $41 million per year industry. To this end, the TAHC, now led by TTU alumnus Coleman Locke, remains critical to the state. An outbreak of foot and mouth disease – like that which occurred in the Houston area in the 1920s – would cripple the state's economy. A team of researchers from Uni-

versity of California Davis and Texas A&M University estimated by modeling the effects on trade costs to slaughter herds, clean premises, etc., that each hour's delay in detection of foot and mouth disease could cost in excess of $500 million. Protecting Texas's animal agriculture and wildlife populations is essential.

Recognizing a Need (1971)

As the Texas economy and population grew, and animal agriculture continued to expand and modernize, veterinary needs of Texas both evolved and grew. As a result, a proposal to implement a veterinary medical education program at TTU emerged decades ago. It was driven – as it remains today – by the unaddressed and growing needs to produce veterinarians that serve agricultural communities across Texas and to expand access to affordable, cost-effective medical and veterinary education for Texans.

In response to the rapid expansion of the feedlot industry in the High Plains, the THECB met in November 1971 to study and discuss "ways and means to meet the veterinary medical education and service needs of Texas" (Appendix J). The Program Development Committee determined:

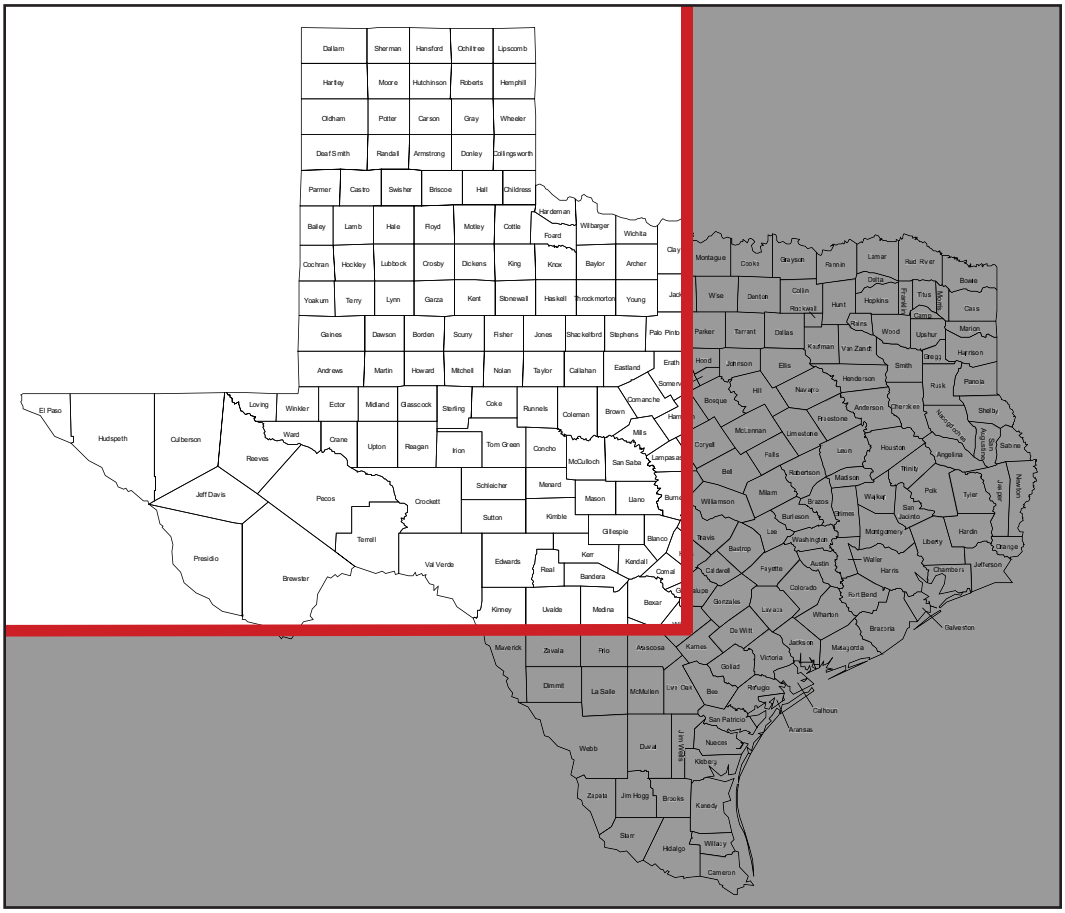
- Needs in West Texas for more large animal practitioners well-trained in prevention, diagnosis and treatment were not being met;
- Needs of the expanding feed-lot industry in West Texas are "integral with and inseparable from" the economic needs of the state;
- Service elements of veterinary medicine –such as animal research and clinical teaching facilities – were needed in West Texas; and
- A demonstrable need for more veterinarians exists in the United States; indeed, the Southern Regional Education Board recommended an additional school in the south to help meet the need for veterinarians and education.
    - "Many qualified Texas residents are now unable to pursue the [Doctor of Veterinary Medicine] degree because of limited spaces available in Texas."

Board members concurred there were service needs in the Panhandle and West Texas that were not adequately met by existing programs and institutions. The THECB (then the Texas College and University System Coordinating Board) voted to approve on November 19, 1971, the TTU proposal to establish a School of Veterinary and Zoological Medicine in conjunction with its newly approved School of Medicine.

Texas Tech University and Agriculture

This approval was a natural addition for TTU. Agriculture was one of the four founding programs of the university, which was established by the Texas Legislature in 1923 to serve the needs of Texas west of the 98th meridian and north of the 29th parallel – a region larger than 46 of the nation's 50 states (Appendix D).

Figure 1. Map of Texas with indicators of region bordered by 98th meridian and 29th parallel.



TTU has grown tremendously since it opened its doors and now has the largest non-land grant college of agriculture in the U.S. The university's animal agricultural programs have achieved international prominence in many areas such as food safety, meat science, livestock production and equine sciences. The university's relationship with and its unique understanding of the needs of agricultural industries make it an ideal institution to implement a much-needed and long-overdue second veterinary school in Texas.

The Beginning: Texas Tech University and Veterinary Medicine

When working to establish the TTU School of Medicine in the late 1960s, the university also recognized the need for veterinary education to support the region's growing communities and the need to expand access to veterinary medical education. Consequently, it included a veterinary school in its Master Plan for the School of Medicine.

The THECB subsequently recognized the proposal as a "unique opportunity for the state" as it planned to develop programs in human and animal medicine through close collaboration with the School of Medicine. Despite the THECB's approval, the veterinary medical program was not implemented to ensure the successful establishment of the medical school.

In the four decades since this approval, the need for expanded veterinary education opportunities and services continued. In 2009, the THECB again articulated specific, growing needs that Texas was failing to adequately address, and it is clear that more of the same will not address all of Texas' diverse needs. In particular, with a growing economy, human and pet population, expansion and intensification of animal-agricultural industries, a growing world population with increased purchasing power for foods of animal origin, and an increased small-animal specialization in traditional models of veterinary education, the shortage of veterinary services has expanded across all of Texas. In particular, there are disproportionately urgent needs for:

- General veterinary practitioners that serve the needs of agricultural communities;
- Specialized veterinary services that support our agricultural industries as they expand and adapt to provide proteins for a growing world population;
- Access to affordable, high-quality veterinary education; and
- Solutions to address shared animal and human medical challenges such as delivery of medical services to underserved communities and control of emergent (or re-emergent) zoonotic diseases such as tuberculosis.

These needs are not unique to Texas and require innovative solutions. In response to similar needs in Alberta, Canada, the University of Calgary established its Faculty of Veterinary Medicine (UCVM) to develop a wholly innovative and cost-effective approach to veterinary education. The program has been an overwhelming success; it is fully accredited by the common U.S.-Canadian accrediting body, 98 percent of graduates stay in Alberta to practice and almost two-thirds of graduates work in practices serving agricultural communities. Moreover, it is now ranked No. 48 in the world for schools of veterinary medicine based on measures of research impact, academic reputation and employer reputation; of the 30 veterinary schools in the

U.S., the UCVM ranks above 13. The success of the program is particularly remarkable considering the college enrolled and graduated its first class in 2008 and 2012, respectively. This success reflects the program's innovation and focus on quality of education, research and service.

A Proven Track Record

The TTU School of Medicine, which has now grown to become the comprehensive TTUHSC, was established to address a critical shortage of physicians in West Texas. In 1970, there was one physician for every 1,350 people in West Texas. Forty-five years later, the impact of TTUHSC has cut the doctor-patient ratio in half.

Specific important outcomes were expected from the TTU School of Medicine; and it has delivered in spades. Remarkably, the creation of the School of Medicine provided opportunities to do great and meaningful things that the founders could not have foreseen. For example, TTUHSC is now a premier center of primary care and family medicine in the country. It graduates more health professionals than any other health related institution in Texas. Moreover, as a result of innovative and transformative approaches that addressed specific education and service needs, ensuing growth of the TTUHSC led to the creation of TTUHSC El Paso, the first health related institution in the nation located on the U.S.-Mexico border.

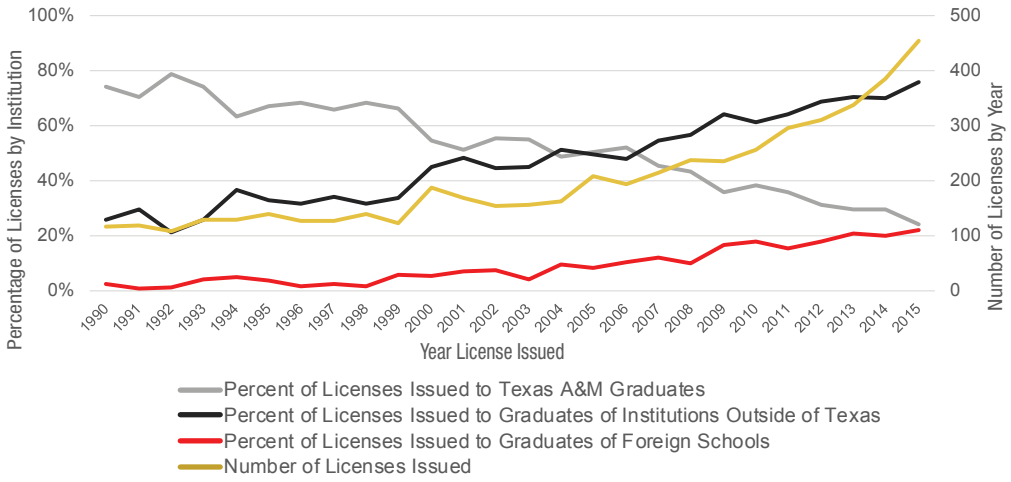
Before the creation of the School of Medicine, it was passionately argued that existing programs within Texas could meet the needs of West Texas through the expansion of programs in urban Texas cities such as Houston and Dallas. A parallel argument has emerged about veterinary medicine in Texas. Once again, however, an innovative approach is the needed solution. In 2016, the THECB recognized this and adopted a recommendation to consider a "new college of veterinary medical education that is designed to specifically produce large animal veterinarians in an innovative, cost efficient manner that does not duplicate existing efforts"(Appendix K). In effect, the THECB invited TTU to provide a solution.

In response, the herein feasibility study has been prepared to assess the workforce and educational demands, accreditation of the academic program and financial support while meeting the THECB recommendation for an innovative, cost-efficient solution for the challenges related to veterinary medicine faced by the state that complements existing efforts.

3. Workforce Feasibility

Veterinarians in Texas enjoy full employment and greater than 95 percent Doctor of Veterinary Medicine (DVM) students graduate from their existing

Figure 2: Licenses issued by the Texas Board of Veterinary Examiners, 1990-2015



programs into known employment. Given full veterinary employment in Texas, a key indicator of the growing workforce demand for veterinarians is the number of licenses issued to qualified veterinarians each year.

Since 1990, the number of licenses issued by the Texas Board of Veterinary Medical Examiners (TBVME) has increased from approximately 120 per year to approximately 450 (Figure 2; gray line). In the early 1990s, graduates of the sole existing program in Texas accounted for almost 80 percent of the licenses issued annually (red line). In a period of only 25 years, graduates of the existing program now account for only approximately 24 percent of licenses issued.

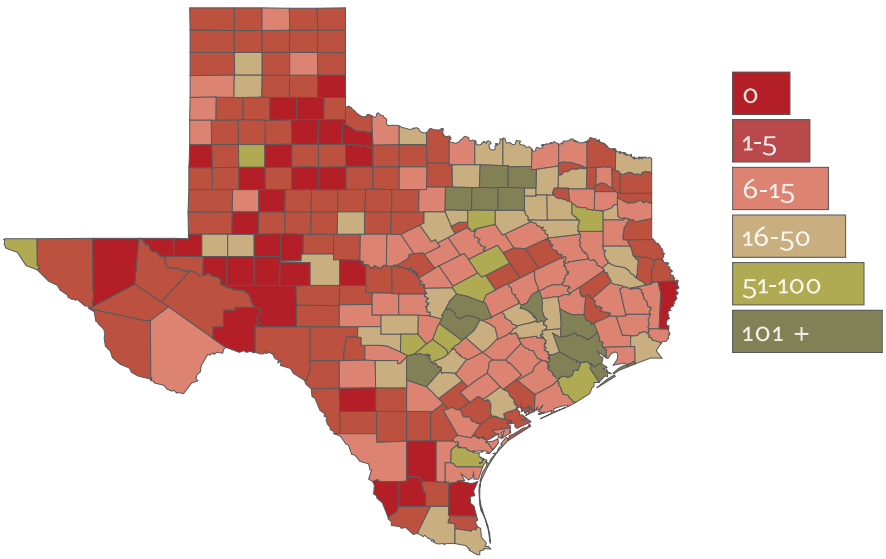
Even after accounting for the proposed expansion to approximately 162 seats per class (Appendix E), the existing DVM-granting institution within Texas is not keeping up with – and cannot keep up with – the number of new veterinarians needed in Texas. The continued and robust growth in Texas' population, economy and animal-agricultural industries have exceeded the capacity of any single institution.

In the span of just two to three decades, Texas has transformed from a state that trained its own veterinary workforce to address its specific needs into a state that is now overwhelmingly dependent on other states – and other countries – to train its workforce (see black and green lines in Figure 2). Moreover, a substantial proportion of those trained out of Texas (at both U.S. and foreign institutions) attended private institutions. The mission, and, therefore, curricular focus of these private institutions are generally very different than public institutions that have a mission to serve the interests of the state.

The health of the veterinary job market is expected to expand and remain robust well into the future. The Bureau of Labor Statistics (BLS) predicts the nationwide demand for veterinary employment to grow 18.1 percent through 2026 (Appendix F). For Texas, the projected rate of job market growth is 18.9 percent with the creation of 900 new positions for the period of 2014 to 2024. This is 2.6-fold greater than the projected rate of growth for all occupations. At the same time, of the 6,635 licensed veterinarians in Texas, 27.7 percent (1,841) are over the age of 60 and many will leave the profession in the next decade. The true future workforce demand is in all likelihood much greater than that predicted by the BLS.

Much of anticipated veterinary job growth will be driven by increasing demand for animal protein by growing domestic and global populations and, therefore, reflects a disproportionate growth in the job market for those veterinarians who serve the needs of agricultural and small communities. Despite this disproportionate growth in these communities, DVM graduates predominantly move to and practice in major urban and suburban areas. This maldistribution of veterinarians has resulted in excess workforce demand in small and agricultural communities across Texas.

Figure 3. Number of licensed veterinarians by county (TBVME data; received 2016).



The consequence is an insufficient number of qualified – and in some instances, an absolute lack of – applicants responding to job opportunities in small and agricultural communities. This is leading to chronic job vacancies, reduced veterinary services provided to communities and the livestock industry, a drag on business growth and an increasing inability to sell practices.

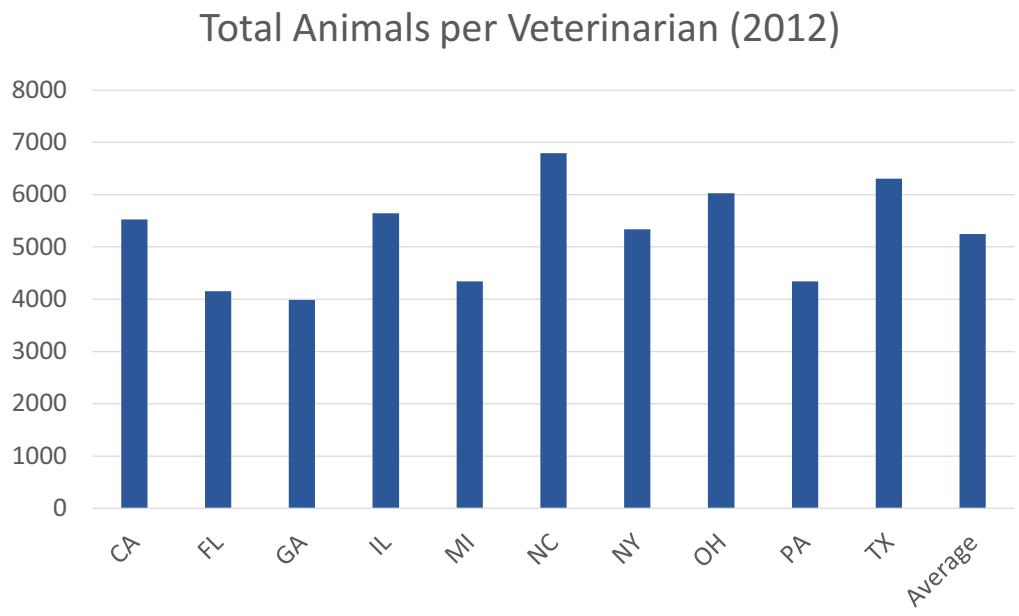
Failing to recruit to sufficient new graduates also results in a disproportionately older community of veterinarians in small and agricultural communities. According to the data compiled by the TBVME, 25 percent of veterinarians

(n=5,625) in the 67 counties with greater than 50,000 residents (2010 Census data) are over the age of 60. However, in the remaining 187 counties (i.e., 74 percent of all Texas counties, incidentally where most of the livestock is raised) 41 percent of the veterinarians (n=1,010) are over the age of 60. Furthermore, 40 percent (approximately 800 veterinarians) of the USDA's veterinary workforce was reported to be eligible to retire starting in 2016 (Appendix G). Not only is there a growing shortage that results in limited access to veterinary services, but age-related departures from the profession will disproportionately affect small and agricultural communities across Texas.

This worsening workforce shortage is increasing the vulnerability of one of the State's most important economic engines, the livestock industry, to foreign or reemerging animal diseases. Reduced access to veterinary services has the potential to result in tremendous economic losses to Texas through lost productivity or if the State's ability to export animals or animal products is restricted.

Texas has the largest cattle population in the nation, yet ranks last among the 10 most populous states for the ratio of cattle to veterinarians, with nearly 10,000 cattle per veterinarian above the average. Further, the region of Texas that serves as a national epicenter for food and fiber production is seriously lacking in adequate veterinary services.

Figure 4. Food and Fiber Animals per Veterinarian in the 10 Most Populous States.



There is a concentration of feedlots and dairy farms in the Texas Panhandle; concentration of these centers of agriculture and animal-needs is disproportionate to the distribution of veterinarians in the Panhandle.

Figure 5. Heat map of feedlots in the United States.

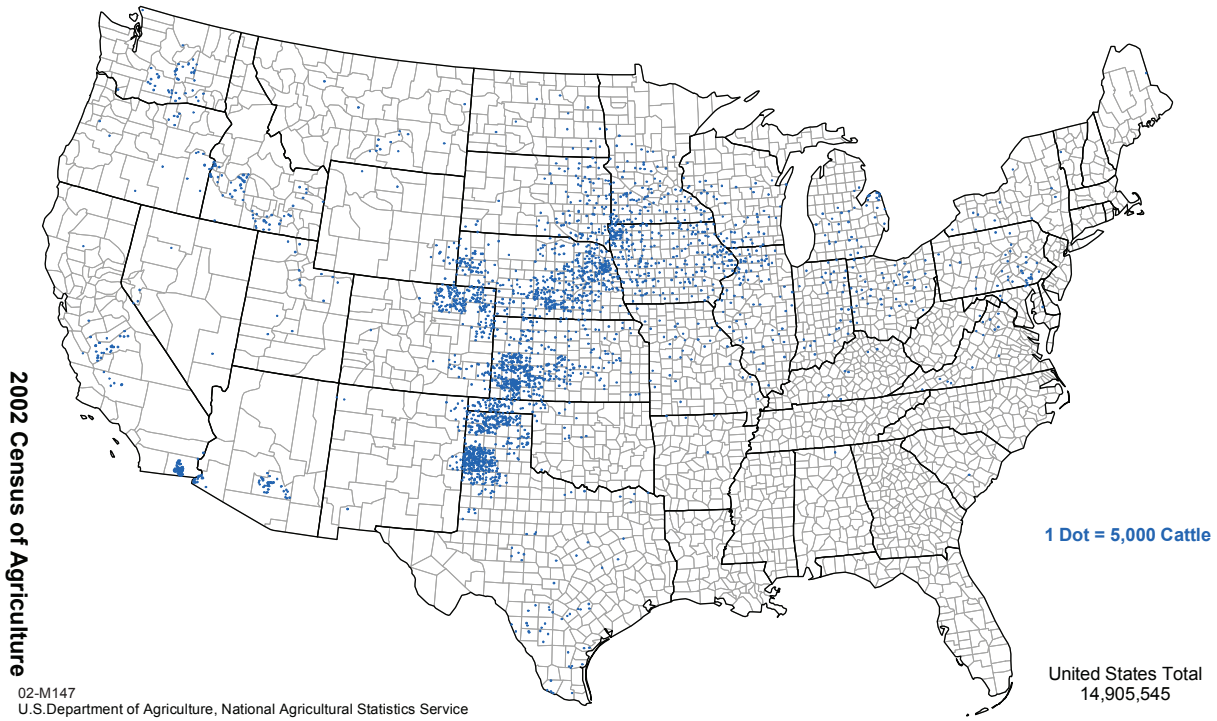


Figure 6. Heat map of dairy farms in the United States.

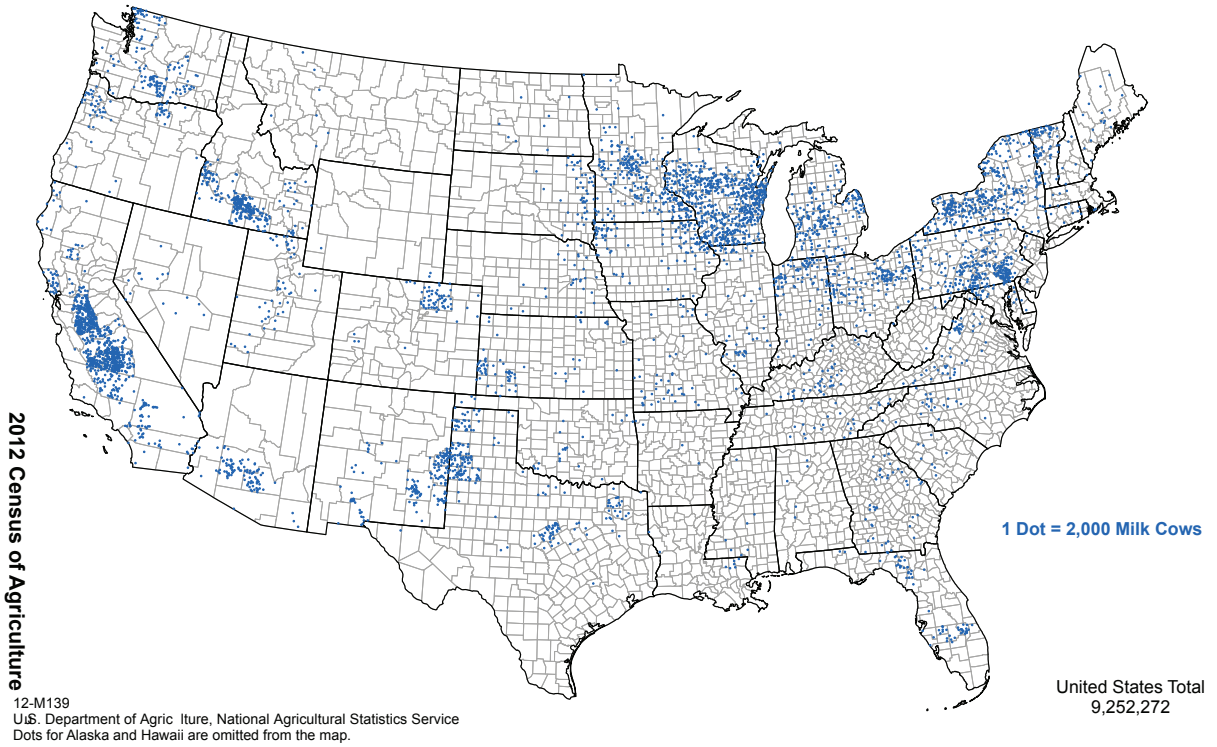
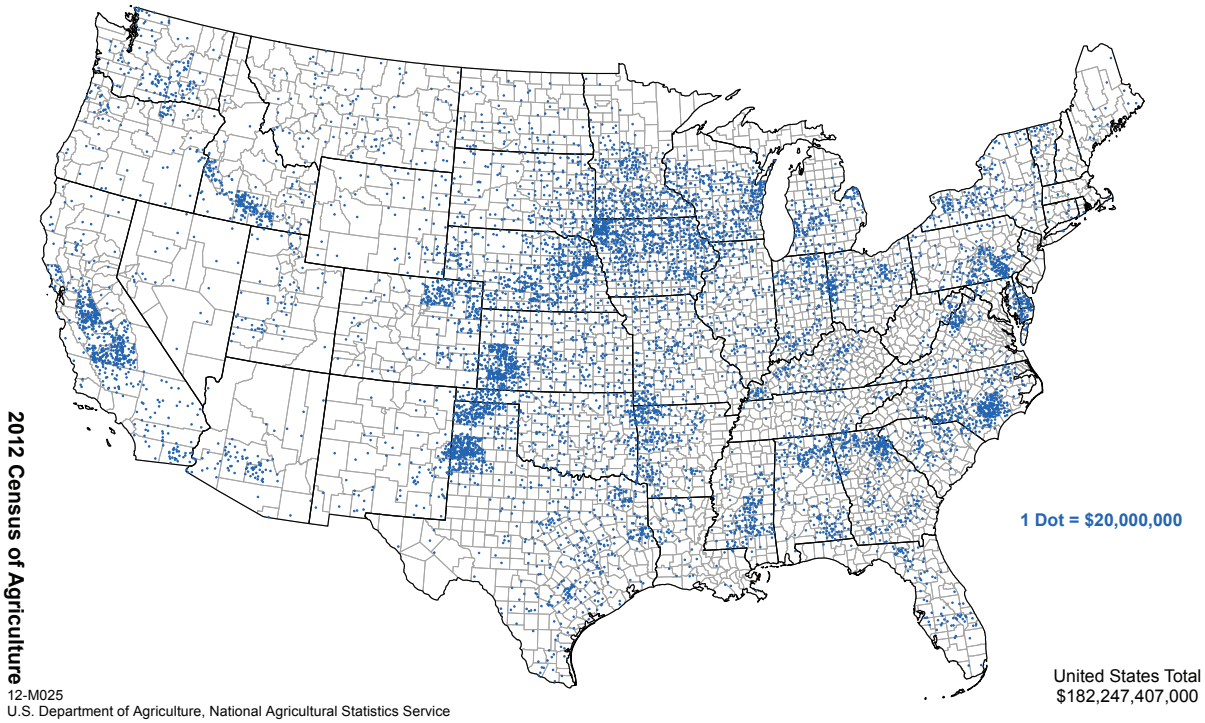


Figure 7. Heat map of value of sales of livestock, poultry and their products.



There is a persistent and growing workforce demand for veterinarians that serve the needs of small and agricultural communities. It is important to note that veterinarians serve rural communities in a variety of ways. This includes the small- and mixed-animal practitioners, veterinarians who provide services to livestock industries, industry and academic veterinarians involved in research and innovation, and government veterinarians who help protect animal populations from foreign and reemerging animal diseases.

Continued maldistribution of the workforce will exacerbate job market demands in small and agricultural communities. Yet many counties are already experiencing a workforce demand-supply disparity with few and, in some cases, no veterinarians available to provide veterinary services.

Summary: Workforce Feasibility Assessment

Workforce demands in Texas have far exceeded the capacity of the sole existing veterinary medical program in Texas. Moreover, Texas is now overwhelmingly dependent on institutions – and increasingly private institutions – located out of state and country to meet its workforce demand. The veterinary job market is expected to grow at more the double the rate of other professions according to the BLS. Moreover, the THECB has invited a proposal for an innovative new veterinary program to address a growing workforce shortage. Sufficient workforce demand exists to employ graduates of a new veterinary medical program at TTU.

4. Educational Demand

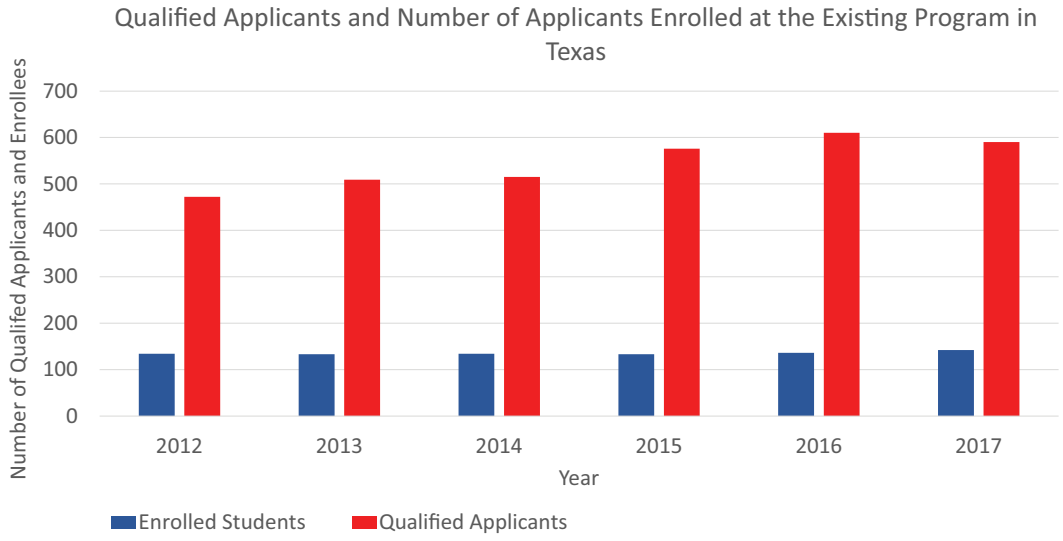
The state's only existing DVM-granting program is the College of Veterinary Medicine and Biomedical Sciences at Texas A&M University (TAMU CVM) in College Station. This program, established over 100 years ago, had, until recently, a capacity of 132 seats and is in the process of expanding its capacity to approximately 162 seats. This program enrolls its capacity of students.

Year	Seats	Enrolled Students	D.V. M. Graduates
2012	132	134	130
2013	132	133	128
2014	132	134	133
2015	132	133	128
2016	132	136	130
2017	*	142	132

**With the opening of a new education and administration building at the TAMU CVM (the Veterinary & Biomedical Education Complex), a goal to expand class size to 162 students was announced.*

Once fully expanded to approximately 162 seats, the existing program will still be at capacity, but even at this level, it will still be insufficient capacity to meet the educational demands of Texans. At its stated target capacity, the existing program in Texas will match the largest class size of any veterinary educational program in the U.S. or Canada. Few medical education programs can expand far beyond this sort of capacity and still maintain adequate quality of education.

Figure 8. Qualified applicants to seats at the existing DVM program.



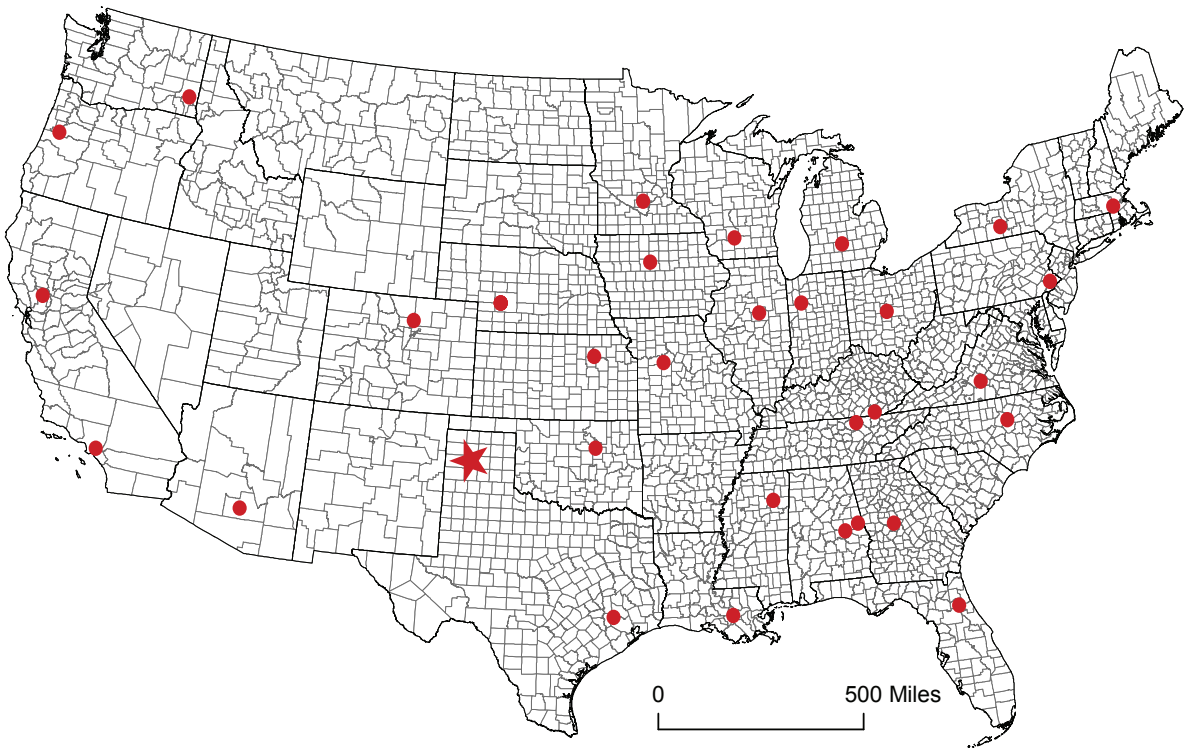
The existing program is – and will remain – at capacity; consequently, it turns away several-fold more qualified applicants than it can accept. It is not meeting the educational demands of Texans, nor are its outputs meeting the growing veterinary workforce needs in Texas.

The average qualified applicant-to-enrolled student ratio for the last three years at TAMU CVM is 4.37 to 1. To put this in perspective, the applicant pool to enrollees for schools of medicine across Texas during the same period of time was 3.38 to 1.

Outside of Texas, there are 29 accredited DVM-conferring institutions in the United States (Figure 9; consisting of 24 public and five private programs). The five nearest accredited DVM-granting institutions to the new DVM program, located on the TTUHSC campus in Amarillo, are:

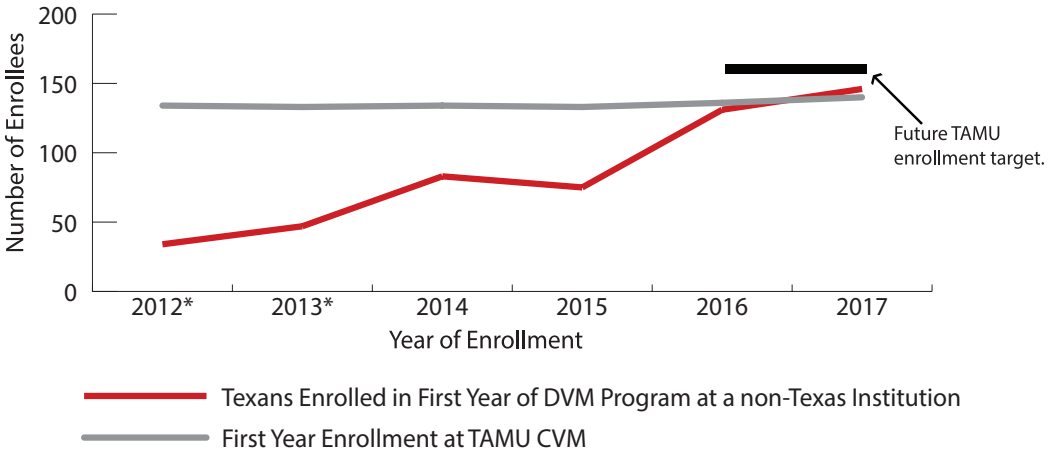
- Oklahoma State University, Stillwater, OK; 321 miles from Amarillo
- Kansas State University, Manhattan, KS; 471 miles from Amarillo
- Colorado State University, Fort Collins, CO; 497 miles from Amarillo
- Texas A&M University, College Station, TX; 514 miles from Amarillo
- University of Missouri, Columbia, MO; 709 miles from Amarillo

Figure 9. DVM-conferring institutions in the U.S.; star indicates proposed program in Amarillo



One consequence of failing to provide sufficient educational access to Texans is that qualified applicants are forced out of state or country to pursue their education (Figure 10). In 2017, there were 146 Texans enrolled in first-year programs out of state compared to 142 students in the sole existing program in Texas. As a result of lack of capacity in the existing veterinary education program, Texas is – and more of its citizens are – is dependent on non-Texas institutions for educational needs. Moreover, an increasing number of Texans are now forced to attend private veterinary programs in other states and even in other countries.

Figure 10. DVM students enrolled in out-of-state institutions vs in-state.



**Private schools a Carribean began reporting in 2014.*

Texans, therefore, leave the state and spend tuition, fees and living expenses in other regions. Attending out-of-state institutions exposes students to the potential of paying non-resident tuition rates and increased debt risks. The average debt borne by graduates from an out-of-state program is in excess of 20 percent greater than the debt for in-state students. Furthermore, for U.S. citizens graduating from a non-U.S. program, the mean debt was greater than $250,000, with the majority of students having a debt to income ratio of greater than 4:1 (Appendix H).

Summary: Educational Demand Feasibility Assessment

Texas's sole existing veterinary medical education program is at capacity and, consequently, turns away several-fold more qualified applicants than it can enroll. Moreover, because of lack of alternative veterinary medical educational options in Texas, hundreds of students are forced to enroll in out-of-state (and out-of-country) programs with an increasing reliance on private institutions. In effect, Texas is exporting its citizens to provide an economic impact elsewhere. If these students return to Texas, they typically return with substantial educational debt. Sufficient demand for education exists in Texas to support a new veterinary medical program at TTU.

5. Academic Feasibility

In 2016, the THECB released a new report on veterinary medical education in Texas. In the report, the Board determined a "proposal designed to specifically produce large animal veterinarians in an innovative, cost-efficient manner that does not duplicate existing efforts" should be considered to address the shortage of large animal veterinarians in the state. Leadership from the Texas Tech University System Administration, TTU, TTUHSC and Dr. Alastair Cribb met with Commissioner of Higher Education Raymund A. Paredes, Ph.D., and senior staff on Feb. 12, 2018. The delegation shared its analysis of the workforce need, educational demand and an innovative approach to provide a targeted solution.

TTU's position in West Texas and relationship with the agricultural industries that populate it have given the university a unique understanding of the needs of agricultural industries and the region and insight into how best to address them. Just as it did in 1969 with the creation of the School of Medicine, TTU is prepared again to implement an innovative, complementary plan to transform the landscape of veterinary education in Texas and address the critical issues challenging the prosperity of the region and its driving industries.

By listening to and learning from advisory partners, TTU has crafted an innovative model of veterinary education that addresses the unmet workforce demand in small and agricultural communities, and the need for increased educational capacity and support of regional agricultural industries, while maintaining cost-efficiency and quality of education. The plan focuses on producing practice-ready veterinarians with the passion to serve and skills to succeed in agricultural communities across Texas. Eschewing the high costs associated with traditional veterinary education models, Texas Tech has embraced an approach that dramatically decreases the cost of education and provides tremendous value to Texas students and families.

The TTU SVM will adapt and build upon a trailblazing approach to veterinary medicine developed at the University of Calgary in Alberta, Canada. Fully accredited by the AVMA Council on Education (a joint accrediting body for all U.S. and Canadian veterinary medical programs), this innovative program has delivered on its promise to produce rural-serving veterinarians. Of the college's graduates who entered private practice, 63 percent of them took a job serving rural Alberta.

The UCVM model was borne out of a similar need for veterinarians as currently faced in Texas. First, the program selects students most likely to succeed in rural practice and then provides them a curriculum designed around the competencies and skills needed to be successful. Next, the program

uses community partnerships to provide clinical experiential learning by collaborating with a contractual network of select veterinary practices, public agencies and other agricultural sites. This program has been an overwhelming success for students, the participating veterinary community and the university. It also offers tremendous cost efficiencies by eliminating the need and expense of an animal teaching hospital.

TTU SVM is purposely designed to capitalize on the success of the UCVM model, and the founding dean of the UCVM, Alastair Cribb DVM PhD, is serving as consultant on the TTU SVM. In addition, John Thomson DVM, the highly-respected former dean of the veterinary medicine programs at Iowa State University and Mississippi State University, is also serving as a consultant. Both have forged innovations in veterinary education and are highly accomplished.

Graduating veterinarians to serve small and agricultural communities begins with recruitment. Once applicants have demonstrated that they meet academic standards, admission to the TTU SVM will be based on a holistic selection model developed by the American Association of Medical Colleges that balances attributes, life experiences and academic metrics to align with the mission of the school.

Next, the TTU SVM will use curriculum designed specifically for general veterinary practice and experiential clinical learning in rural general practice settings. Electives are designed around production-animal medicine, One Health (the intersection of animal, human and environmental health), and investigative medicine and biomedical research.

This approach supports the first strategic priority of TTU, to 'Educate and empower a diverse student body.' This is particularly relevant to TTU because it has been classified as an eligible Hispanic Serving Institution (HSI). TTU is one of only a very small handful of institutions that are designated as both a Carnegie Highest Research Activity (R1) university and an HSI. With the addition of the new doctoral program in veterinary medicine, TTU will be the first R1, HSI, DVM-conferring institution in the U.S.

In keeping with the strategic priority to educate and empower a diverse student population, the SVM will implement a plan to recruit a diverse student body. Initially, the school will build relationships with those institutions offering pre-veterinary medicine programs, particularly those with a student population derived predominantly from small and agricultural communities (e.g., TTU, Angelo State University, Sul Ross University, Tarleton State University, Prairie View A&M University, West Texas A&M University, etc.). Many of these institutions already provide access to underserved populations and have a diverse student population. Two primary goals of the relationships will be to:

1. Recruit applicants with the needed intellectual ability to assimilate the required knowledge, and possess the attributes (e.g., originating from an agricultural or small community, individual interests, race, ethnicity, or gender) and life experiences (e.g., exposure to rural veterinary practice or farming/ranching, club affiliations, leadership experiences, or involvement in undergraduate research) expected for a veterinarian to serve the needs of small and agricultural communities; and
2. Develop, align and streamline pre-requisite courses so students can apply to the TTU SVM early in their baccalaureate program (e.g., after 2 or 3 years).

An overarching aspect of the vertically- and horizontally-integrated curriculum is to provide a balance of knowledge, competencies and professional skills needed for general veterinary practice. Although the students are exposed to a variety of specialties, such as internal medicine, the product of the program is designed to be a comprehensively trained, practice ready, primary-care veterinarian.

To prepare students for the final year, didactic courses are focused on principles and knowledge needed for veterinary practice. This focusing of didactic courses enables incorporating hands-on education to impart competencies and professional skills from the outset of the program. Year-end goals for the students are to:

- Differentiate normal from abnormal at the end of the first year;
- Become a diagnostician capable of developing a differential diagnosis list and a plan of action to identify the most likely diagnosis by the end of the second year; and
- Develop and implement a therapeutic plan by the end of the third year.

The final year of the curriculum is a yearlong program. It includes 40 weeks of clinical experiential learning, approximately half of which is in core clinical rotations of production animal medicine, small-animal medicine, equine medicine, diagnostic medicine and general veterinary practice. The remaining time will be allocated to mandatory and student-selected electives. At various time points throughout the year, students' competencies are assessed to ensure progression to desired outcomes. In addition, the final year includes a month where the student returns to the school for preparation for the North American Veterinary Licensing Exam.

Accreditation

The AVMA COE is designated by the Council for Higher Education Accreditation (CHEA) as the accrediting body for DVM-conferring institutions in the U.S. and Canada. The U.S. Department of Education (DOE) also recognizes

the accrediting authority of the COE. Members of the COE are elected by the AVMA, the American Association of Veterinary Medical Colleges (AAVMC), and the Canadian Veterinary Medical Association (CVMA).

The primary function of the AVMA COE is to ensure that minimum standards of veterinary medical education are met. The outcome is to provide students an educational experience that prepares them for entry-level positions in the profession (Appendix I). For new doctoral programs in veterinary medicine requesting accreditation, the COE has articulated a defined process. Specifically, a veterinary college or school may apply for a Letter of Reasonable Assurance if the parent institution:

- Is accredited by a regional or national institutional accrediting body recognized by the U.S. DOE;
- Is legally authorized to confer a professional degree; and
- Employs a veterinarian as dean or chief executive officer of the college of veterinary medicine.

Reasonable Assurance is the classification granted to an institution seeking initial accreditation. Reasonable Assurance classification indicates there is reasonable assurance of future accreditation if the college or school is established according to plans presented to the COE that demonstrate a realistic effort to comply with the 11 standards of accreditation.

With Reasonable Assurance, Provisional Accreditation will be granted when the first class matriculates. The new college or school must continue to provide evidence to assure future compliance with each of the 11 standards through the semiannual reports. Provisional Accreditation status may be granted for no more than five years. During the first semester of the second year of the initial class, a comprehensive site visit will be conducted. A further comprehensive site visit will be conducted during the second half of the final year of the first class. If the COE determines that the college is in full compliance with the 11 standards, Accredited status will be granted. This status is granted for a period of up to seven years.

*Proposed Timeline of Accreditation for TTU School of Veterinary Medicine**

Action	**Date/Time period (actual or proposed)**
THECB Granted Planning Authorization	June, 2016
TTU Request for Consultative Site Visit from the AVMA COE	August, 2017
AVMA COE response to TTU in the affirmative	October, 2017

AVMA COE Consultative Site Visit	Spring, 2019
AVMA COE Report to TTU following Consultative Site Visit	Summer, 2019
TTU Requests Letter of Reasonable Assurance and AVMA COE Site Visit for Letter of Reasonable Assurance	Spring, 2020
AVMA COE issues Letter of Reasonable Assurance	September, 2020
TTU Begins Semiannual (January, July) reporting to AVMA COE Liaison Committee to provide Evidence of Continued Progress	
Recruitment of Initial Class	Fall, 2020
Offer Letters to Initial Class	Spring, 2021
Initial class matriculates	August, 2021
AVMA COE confers Provisional Accreditation	September, 2020
AVMA COE Site Visit (1st semester, 2nd year of program)	Fall, 2022
AVMA COE Site Visit (2nd semester, 4th year of program)	Spring, 2025
First graduating class	Spring, 2025

**American Veterinary Medical Association (AVMA) Council on Education (COE) is the accrediting body for U.S. and Canadian veterinary medical programs.*

Summary: Academic Feasibility Assessment

The proposed TTU SVM adapts from a fully accredited and highly successful program. Furthermore, in following the recommendation from the THECB, the proposed school is not duplicative of the existing program within the state and is designed specifically to address the needs identified in the workforce and educational demand assessments and needs articulated by the THECB. The proposed TTU SVM is academically feasible.

6. Philanthropic Opportunities

Bold ideas with the power to transform industries, address global health challenges and revolutionize higher education are only possible through the power of philanthropy. While TTU requests the State of Texas support the operation of the SVM through formula funding, philanthropic investment is needed to build state-of-the-art facilities, recruit top faculty and research scientists, and demonstrate that visionary industry leaders and stakeholders are equal partners in this ambitious undertaking.

Institutional Advancement at the TTU System, TTU and TTUHSC is seeking donor investments with a goal of $90 million to fund total construction of the SVM. There has been significant community interest in and support of the project in Amarillo, as well as interest and support from industry leaders across the region and state.

Compelled by the economic impact of the SVM on the greater Amarillo area and the prominence the school would bring to the region, a group of influential community leaders have assembled a fundraising committee to brainstorm strategy and prospects to support the overall philanthropic success of the initiative.

Through contacts made via the fundraising committee and by prospecting done by Institutional Advancement, to date (5/9/18) the initiative has amassed $47.9 million in total commitments, $20.45 million in proposals are being actively considered by donors and $32.45 million in asks are being prepared for delivery to vetted prospects. Through conversation, networking and prospecting, and without public marketing, the development team has **identified a total potential of $103.4 million for the SVM.**

Support for the SVM is vast and diverse; interest has been generated from individual donors, foundations and leading businesses who inherently support TTU, understand the value the school brings to the region and agricultural industries, or those whose lives the school would directly impact.

Throughout conversations during the fundraising process, the development team and university leadership continually hear positive feedback and engage in fruitful conversations with potential donors and supporters of the initiatives.

On May 8, 2018, the Amarillo City Council approved an amendment to a 2016 agreement between the TTU System and the Amarillo Economic Development Corporation (AEDC) to fund up to $69 million to ensure the construction of the TTU SVM in Amarillo, Texas. The TTU System has committed to continuing private fundraising operations.

Summary: Feasibility Assessment of Philanthropic Opportunities

There is sufficient philanthropic support to finance the facilities and, in time, to support student scholarships and other areas.

7. Financial Feasibility

Operational Financial Feasibility

Through coordination with TTU System CFO Gary Barnes, former TTU System CFO Jim Brunjes, TTU CFO Noel Sloan and consultants, an operational budget was prepared and iteratively refined. President Lawrence Schovanec provided a clear mandate that the budget needed to be sufficient to provide for a self-supporting academic unit and to provide its fair-share of financial contribution to support centralized shared services. The budget was designed to grow the program in conjunction with the timeline for accreditation and to provide sufficient faculty and support so that TTU can meet the 11 standards of accreditation within its chosen model of education. The budget was developed with intent to not divert or drain resources from other areas of TTU and create new revenue opportunities through graduate-level programs.

By implementing a hybrid distributive model of education perfected by the UCVM, TTU will avoid one of the largest cost-centers that burden traditional models of veterinary medical education: the teaching hospital. Notably, the budget, while designed to support the professional veterinary medical program of 60 students per class (240 students), is also sufficient to support a robust population of graduate students of up to 150. No additional faculty or facilities are needed to support this population of graduate students.

Once annually operational, the support needed for program operation is $19.3 million in 2018 dollars. Revenue needed to offset these expenses are derived primarily from formula funding, tuition and fees, and to a lesser extent, other sources of revenue such as fee for service typical of veterinary programs, gifts, salary savings, grants and contracts and F&A return. Current biennium formula rates ($55.82 per semester credit hour) and program weights (23.3) were used to calculate weighted-semester credit hour formula generation. Veterinary medicine education programs are the most prolific in the state in terms of income with an estimated $78,000 return from a three-hour class with 20 students enrolled (Appendix L).

A program fee ($18,000 per academic year) and special fee ($3,165), in addition to a conservative estimate of $1 million in other sources of revenue, were used. It should be noted, however, that all program and special fees are preliminary and subject to further consideration and approval. To support centralized and shared services, 10 percent of the program fee and all of the special fee is retained centrally. Program cost is on track to be one of the lowest in the country.

Because of the delay in generation of formula funding and the need to build the professional program in a staged manner before the students are enrolled, non-formula requests are calculated based on the consultants' recommendations on the accreditation timeline. Non-formula funding is commonly requested for start-up costs of new programs in the state. It is anticipated that no special item funding will be requested beginning the fifth biennium. After which, the program is to operate as an academic unit supported solely by formula generation, tuition program and fee, and other sources of revenue.

Summary: Operational Financial Feasibility

A budget was designed to build the program along with the timeline for accreditation and to provide sufficient faculty and support so that TTU can meet the 11 standards of accreditation within its chosen model of education. The budget is sufficient to provide for a self-supporting academic unit, to provide its fair-share of financial contribution to support centralized shared services, and includes sufficient faculty to support both the professional program and graduate students. The proposed TTU SVM is operationally financially feasible.

Financial Feasibility of Facility Requirements

A substantial advantage of designing a new professional program is that the facilities and curriculum can be developed together, in that the curriculum informs the facility needs and design, and the facilities enables the curriculum.

In working with the consultants, TTU System FP&C estimated the facilities total project budget using the THECB's Statewide Construction Average table, current commercial construction indexes, information from the designers of the UCVM buildings and the institution's own historical hard and soft costs to provide the initial statement of probable cost at $89.82 million. This is far more cost-effective both in terms of up-front costs and ongoing facility support than the costs needed to construct the facilities of a traditional veterinary medical program. The THECB reported estimates such costs in the range of $200 million to $500 million (Appendix K).

TTU leadership plans to raise commitments to support construction of the facilities. Progress toward this goal is described in section 6 of this feasibility report 'Philanthropic Opportunities'. In addition, in its December 2017 meeting, the Board of Regents approved Phase 1 of the design process, which authorized TTU to hire a design professional and conduct a feasibility study.

Summary: Financial Feasibility of Facility Requirements

The hybrid distributive model developed by UCVM offers substantial facility cost reductions compared to the infrastructure needed to support a traditional model. Initial FP&C estimates place the facilities cost at approximately $90 million.

The facilities needed to support the proposed TTU SVM are financially feasible given achieving the goal to raise commitments to support its construction.

8. Conclusion

The veterinary medical needs of Texas – whether they be workforce needs, access to affordable education, or support of livestock industries as they face the challenge of feeding a growing global population – have exceeded the capacity of any one institution. The Texas A&M University College of Veterinary Medicine and Biomedical Sciences articulated a target class size of 162. When this is achieved in the next year or so, the program will match in size the largest veterinary medical program in the U.S. and Canada (two countries that use a common accrediting body). Even at this record-equalling class size, the program will still fall well short of meeting the veterinary medical workforce needs of Texas and educational demands of Texans.

With its rich history of serving agriculture, TTU is uniquely poised as a Carnegie R1 and HSI institution to implement an innovative, cost-effective model of veterinary medical education that aligns with newly adopted Strategic Priorities of:

1. Educate and empower a diverse student body;
2. Enable innovative research and creative activities; and
3. Transform lives and communities through strategic outreach and engaged scholarship.

The needs faced by Texas are not altogether unique to this state; they have been recognized elsewhere. In particular, similar needs were identified in Alberta following the detection of diseases that, in part, created crises in the province's agriculture sector, which ultimately affected the province's fiscal health. The citizens of Alberta realized that they needed to better protect a key economic engine by training their own workforce and supporting their livestock industries.

From Alberta's crisis emerged the University of Calgary Faculty of Veterinary Medicine. It was built on an innovative model and has been highly successful. It is fully accredited, and approximately two-thirds of its graduates entered practices that serve agricultural communities across Alberta. Moreover, the UCVM is now the second highest-ranked veterinary medicinal program in Canada. The UCVM model offers considerable cost efficiencies for the proposed TTU SVM; most notably, this model does away with the on-campus teaching hospital and instead proactively engages the community to meet its educational objectives. Coupled with innovations from TTUHSC, TTU has developed an academic plan based on the UCVM model. The proposed plan would place a veterinary school on the same campus as a medical school and a pharmacy school for the first time in the U.S. and introduce opportunities for interdisciplinary studies and research.

An exhaustive feasibility assessment was performed of the workforce needs and capacity to employ TTU graduates, sufficiency of the educational demand to supply high-quality applicants, accreditation process, financial support needed for operations and facilities, and philanthropic opportunities. In all instances, the proposed TTU SVM is feasible.

TTU School of Veterinary Medicine
Feasibility Report Appendices
Available Upon Request

Appendix A - Texas Animal Health Commission Celebrates 125 Years
News release, TAHC

Appendix B - Invasive Potential of Cattle Fever Ticks in the Southern U.S.
Giles et al., 2014

Appendix C - Texas Veterinary Medical Association, Robert E. Norton

Appendix D - A History of Texas Tech

Appendix E - 2015 Annual Report
Texas A&M University College of Veterinary Medicine & Biomedical Sciences

Appendix F - Job Outlook: Veterinary Medicine
Bureau of Labor Statistics, Occupational Outlook Handbook

Appendix G - Federal Veterinarians: Efforts Needed to Improve Workforce Planning, Report Summary, U.S. Government Accountability Office, May 2015

Appendix H - Divided by Debt, Melinda Larkin

Appendix I - Statement on accreditation process
AVMA Council on Education

Appendix J - Special Called Meeting of the Coordinating Board Texas College and University System (present day THECB)
Meeting Minutes, November 19, 1971

Appendix K - Veterinary Medical Education in Texas: An Update
THECB. July 2016

Appendix L - The Budgeting Process for Public Universities in Texas
Texas Higher Education Leadership Conference, November 2017