STEM EDUCATION IN ACTION: COMMUNITIES PREPARING FOR JOBS OF THE FUTURE

FIELD HEARING

BEFORE THE

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
HOUSE OF REPRESENTATIVES

ONE HUNDRED TWELFTH CONGRESS

FIRST SESSION

MONDAY, SEPTEMBER 26, 2011

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September 26, 2011

STEM Education In Action: Communities Preparing for Jobs of the Future

MONDAY, SEPTEMBER 26, 2011

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Sullivan Performing Arts Center, Texarkana, Texas

The Committee met, pursuant to call, at 10:00 a.m., at the Sullivan Performing Arts Center, 3941 Summerhill Road, Texarkana, Texas, Hon. Ralph M. Hall [Chairman of the Committee] presiding.

SUBCOMMITTEE ON RESEARCH AND SCIENCE EDUCATION

U.S. HOUSE OF REPRESENTATIVES

STEM Education in Action:
Communities Preparing for Jobs of the Future

September 26, 2011
10:00 a.m. – 12:00 p.m.

Sullivan Performing Arts Center, Texarkana, Texas

Witness List

Dr. Cora Marrett

Deputy Director, National Science Foundation

Mr. James Henry Russell

President, Texarkana College

Dr. Brad Johnson

President, Northeast Texas Community College

Dr. C.B. Rathburn

President, Texas A&M University – Texarkana

Ms. Pam Kennedy

Vice President of Human Resources, CHRISTUS St. Michael Health System

Mr. Myron Barnett

Human Resource Manager, International Paper

Mr. Denis Washington

Chairman, TexAmericas

HEARING CHARTER

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES

STEM Education in Action:
Communities Preparing for Jobs of the Future

MONDAY, SEPTEMBER 26, 2011
10:00 A.M. – 12:00 P.M.
SULLIVAN PERFORMING ARTS CENTER, TEXARKANA, TEXAS

1. Purpose

On Monday, September 26, 2011, the Committee on Science, Space, and Technology will hold the third in a series of hearings to highlight Science, Technology, Engineering, and Math (STEM) education activities across the Nation, their role in inspiring and educating future generations, and their contribution to our future economic prosperity. The purpose of this hearing, STEM Education in Action: Communities Preparing for Jobs of the Future, is to highlight the role of community colleges, specifically the importance of their partnerships and contributions to the local economy, workforce, and other aspects of the community.

2. Witnesses

PANEL 1

- **Dr. Cora Marrett**, Deputy Director, National Science Foundation
- **Mr. James Henry Russell**, President, Texarkana College
- **Dr. Brad Johnson, President**, Northeast Texas Community College
- **Dr. C.B. Rathburn, President**, Texas A&M University–Texarkana

PANEL 2

- **Ms. Pam Kennedy**, Vice President of Human Resources, CHRISTUS St. Michael Health System
- **Mr. Myron Barnett**, Human Resource Manager, International Paper
- **Mr. Denis Washington**, Chairman, TexAmericas

3. Overview

- An educated and well-trained workforce is essential to the economic prosperity of the United States. Today's employers are seeking specific skills and all levels of education to meet their needs. Communities that successfully marry these education needs with community workforce needs help stimulate the local economies.
- Community colleges provide a tremendous service to the communities they serve. In many cases, they serve as the primary postsecondary education and training resource for the community. In all cases, they contribute to the community's economic prosperity, providing employers with an educated and trained pipeline of workers. [1]
- The National Science Foundation (NSF) is an independent federal agency created by Congress in 1950 "to promote the progress of science". With an annual budget of about $6.9 billion (FY 2010), it is the primary source of federal funding for non-medical basic research, providing approximately 40 percent of all federal support, and serves as a catalyst for science, technology, engineering, and mathematics (STEM) education improvement at all levels of education.

[1] http://www.aacc.nche.edu/AboutCC/Trends/Pages/communitycollegesintheircommunities.aspx

- Texarkana College is a two-year, comprehensive community college that offers educational opportunities in traditional academic studies, occupational/technical programs, and workforce development and community services.
- Northeast Texas Community College is a two-year community college that offers students the opportunity of academic studies, workforce programs, distance learning, and partnerships with four-year universities.
- Texas A&M University–Texarkana is a comprehensive regional university that provides citizens a convenient opportunity to earn a four year, graduate, and/or a doctoral degree.
- The CHRISTUS St. Michael Health System serves the Texarkana region of Arkansas, Texas, Louisiana, and Oklahoma. The Catholic, faith-based health system, CHRISTUS St. Michael, was established in 1916 by the Sisters of Charity of the Incarnate Word. CHRISTUS St. Michael offers a full scope of expansive health care services.
- The Texarkana Mill, part of the International Paper Company, produces bleached board for packaging, and hot and cold drink cupstock and folding cartons. Through the International Paper Company Foundation the Texarkana Mill is very involved in the local community and its success.
- TexAmericas Center serves as a business and industry resource for expanding business needs by offering varied transportation, abundant natural and human resources, an adaptable infrastructure and a climate and culture that understands, appreciates and encourages growth on more than 20,000 acres.

4. Background

STEM Education and the Federal Government

A consensus exists that improving STEM education throughout the Nation is a necessary condition for preserving our capacity for innovation and discovery and for ensuring U.S. economic strength and competitiveness in the international marketplace of the 21st century. The National Academies *Rising Above the Gathering Storm* report placed major emphasis on the need to improve STEM education. This recommendation was embraced by the House Science, Space, and Technology Committee following the issuance of the report and was included in the 2007 *America COMPETES Act*. The 2010 America COMPETES Reauthorization Act continues this emphasis.

In total, the FY 12 Budget Request devotes $3.4 billion to STEM education programs across the federal government.[2] The 2010 America COMPETES Reauthorization Act called for the creation of a National Science Technology Council (NSTC) Committee on STEM Education to coordinate federal STEM investments. The first-year tasks of the Committee are to create an inventory of federal STEM education activities and develop a five-year strategic federal STEM education plan. The inventory, as well as a similar Government Accountability Office (GAO) survey requested by the Committee on Education and Workforce, is currently underway and results are expected before next year. These inventories should include community college investments.

President Obama has made strengthening community colleges a priority of his Administration. The American Recovery and Reinvestment Act provided more than $3.5 billion in Pell Grants to low-income students at hundreds of community colleges across the country; over $1 billion in workforce training programs at community colleges to prepare students for work in clean energy industries; health IT, and dislocated worker training; and $40 million in work study funds to help community college students pay for their education through employment.

In addition, the FY 12 Budget request identifies a number of new community college initiatives and existing programs at a number of federal agencies including the Departments of Labor, Education, and Veterans Affairs.

Within this Committee's jurisdiction, the FY 12 budget request for community colleges at the National Science Foundation is $100 million. This funding would be used to expand and strengthen efforts to engage community colleges through several core research and development programs, including the Advanced Technological Education (ATE); Transforming Undergraduate Education in Science, Technology, Engineering, and Mathematics (TUES); the Louis Stokes Alliances for Minority Participation (LSAMP); and the Tribal Colleges and Universities Program (TCUP).

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[2] White House Office of Science and Technology Policy, *Innovation, Education, and Infrastructure: Science, Technology, STEM Education, and 21st Century Infrastructure in the 2012 Budget,* p. 2.

While not specific to community colleges, other funding opportunities at the Foundation that will also contribute to enhancing community college programs are the Scholarship for Service program (SfS); the STEM Talent Expansion program (STEP), Teacher Learning for the Future (TLF), Math and Science Partnership (MSP), and Scholarships in Science, Technology, Engineering, and Mathematics (S–STEM).

In the 112th Congress, the Science, Space, and Technology Committee will continue to hold oversight hearings and briefings on STEM education activities across the federal government and will closely monitor the scope and findings of both the NSTC and the GAO federal STEM education inventories.

Communities and Jobs for the Future

Technology and innovation have kept the American economy strong in the face of increasing competition in the global marketplace. There is a significant role of American science and engineering graduates in helping this country's economy keep pace with this rapid change. As industry moves toward producing more high-tech products and employing technology intensive production methods, the need for technologically and scientifically literate individuals at all levels of the workforce will increase. Thus, the need for science, technology, engineering, and mathematics (STEM) training is now as important for the worker running the production process, as it is for the researcher who created that process.

Many reports find that there are not enough people with the requisite skills to fill the jobs that remain. Encouraging more high school graduates to get some form of postsecondary education is also important. Today, some high school graduates are lucky enough to land entry-level jobs in which they can get career skills through on-the-job training (for instance, machinists, carpenters, and executive assistants). Expanding opportunities for more high school graduates through vocational schools and community colleges is crucial. According to the Job Creation and America's Future report by the McKinsey Global Institute [3], employers are having trouble filling some positions because they cannot find qualified applicants. Some 40 percent of survey respondents who say that they plan to hire in the next 12 months have had positions open for six months or longer because they could not find the right applicant. More broadly, nearly two-thirds report they routinely have openings that are difficult to fill. Of these, management was the most frequently cited type of position. The most difficult occupational categories to fill were in science and engineering, followed by computer programmers and information technology workers. The growing shortage of workers with sought-after skills is reflected in compensation. Wages for engineers and architects grew by 3.5 percent annually from 2002 to 2009, compared with an average of 2.9 percent for all occupations.

The importance for communities to work together as a whole to overcome this economic hurdle is becoming ever so evident. Community and technical college programs can produce the kind of graduates industry needs to fill the open positions. These institutions have long been involved in training technicians for the Nation's workforce, but there is now a growing awareness that community colleges can provide industry with the adequately skilled workers it needs. Serving as models for technology training, the National Science Foundation (NSF) Advanced Technology Education (ATE) centers at community colleges develop tech-training programs that prepare students for a wide variety of jobs in high-tech settings. This program funds 39 centers throughout the country that offer both training for local community college students and a research enterprise to develop and disseminate best teaching and curriculum practices for fields such as biotechnology, chemical processing, advanced manufacturing, and information technology. These programs rely on a partnership between the community college and industry, and throughout the country other institutions can look to ATEs as they develop their own training programs.

Feedback from both colleges and industry personnel on their partnerships, in general, and ATEs, specifically, is positive. Employers like and readily hire the graduates of these programs. However, community colleges face many challenges in creating and developing tech-training programs. Perhaps the most vexing is that these programs often face low enrollment. Since community colleges typically incur a much greater expense in capital costs and maintenance for these programs, they can find it difficult to begin or continue a program without a large number of students, especially on their relatively tight operating budgets. Both community college personnel and industry representatives claim that careers in manufacturing are either unknown by or considered undesirable by students and their parents.

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[3] *Job Creation and America's Future,* McKinsey Global Institute, pg. 48 http://www.commerce.gov/sites/default/files/documents/2011/july/jobs__creation__and__americas__future.pdf

An issue very closely related to attracting large numbers of students to the program is the inadequate math and science backgrounds of many students enrolled in community colleges. Community colleges must attract students to these programs, while also taking measures to remediate basic skills, most commonly in math. Another challenge the community college must address is balancing its role as a "feeder" institution for four year programs with its ability to deliver specialized training for industry. Though articulation between tech-training programs and university is not always possible, community college administrators and tech-training faculty are increasingly embracing the need to endow their technology students with problem-solving skills and an ability and willingness to learn so as to enable them to navigate the inevitably changing skill needs of industry. Highly involved industry partners are a common theme among the most successful tech-training programs. Representatives from both industry and colleges claim that a willingness to devote time and resources to the partnership is crucial for the program to yield the most qualified graduates.

Chairman HALL. All right. If everybody's ready, the Committee on Science, Space, and Technology will come to order.

And I want to welcome today's hearing entitled, "STEM Education and Action: Communities Preparing for Jobs of the Future." We have our packets up here and it contains the written testimony of these very wonderful members here who have given their time and their ability and their background. The way we determine what legislation we write in Washington, D.C., is based on the testimony we get from folks like you-all, because you know more about what you're doing than we do, and from that, we glean the ingredients into the legislation. And all your testimony will be read and will be going into the Congressional record. It will be there for a hundred years. Maybe Congress can get around to it before then, but they will all have this, have your testimony to read again, and it will be discussed many times on—in the Committee room and on the floor of Congress and in the Rules Committee. But thank all of you for being here.

I guess I want to say another word or so here for some folks that are here. I want to thank President and Adrienne Rathburn, first, for my meal last night. And that's number one, you know with most politicians, feed us real good and treat us nice, and you sure do and you did, President of A&M Texarkana. I want to thank the youngsters who are here.

I have Bess Caughran, who is staff member for Mrs. Eddie Bernice Johnson. She is the Ranking Member of Science, Space and Technology. And by the way, there's just a small line between our districts in Dallas and Rockwall and Texarkana. We work together very well. I have Janet Poppleton, who is my chief of staff, has been for 12 or 15 years, something like that. Melé Williams, Melé is a staff director. I have chief of policy, Aaricka Aldridge, here to my left. And Marjorie Chandler is in the audience; and Marjorie's one of the best things that ever happened to me when I got Bowie County into my district. We're very lucky to have her here and advise me. And she and Buddy work day and night, and you're lucky and I'm lucky to have them. And I thank them very much.

I will start out by welcoming everyone here. I had—that for the children—yeah. Yes. I don't want to miss this. I want to welcome the students from Texas High, Arkansas High. Maybe hear from you as I call you out. Students from Texas High, Arkansas High, Liberty-Eylau High, Texarkana High—Texarkana High and Texarkana A&M. How about that? Welcome to all of you. Good morning. Good morning to all of you.

I want to welcome everyone to the Committee on Science, Space, and Technology hearing on STEM Education and Action: Communities Preparing for Jobs for the Future.

I had the pleasure of hosting a field hearing in Texarkana three years ago. And Bart Gordon was the Chairman because the democrats were in control of the House then, and he was a very fine Chairman. I served in the position Mrs. Johnson serving in now as Ranking Member, because I was Republican and we were in the minority. Republicans are temporarily, maybe for the next ten years, are in charge up there now. But if things do change, Mrs. Johnson will be the Chairman, and I'm sure she'll remember this meeting because, to me, Texarkana, this county, this area initiated

the first thrust for STEM for youngsters when land was given by people who were very generous that created an elementary school here were first, so far as I'm concerned. And I want this meeting to highlight that because others will have other meetings directing the same thrusts for STEM, Science, Space, Technology hearing, and they'll be reminded where it all started. We were the first and we were the best. And I'm sure pleased that Eddie Bernice would have the time to drive down from Dallas and be with us here today. We work together very well.

I know that—like to officially welcome our Committee's Members here, and I know that we're glad to have these Members representing the Great State. STEM education's been a top priority for both of us on this Committee. And I'd like also to thank the Texarkana Independent School District for providing the use of this very wonderful new building and auditorium for our hearing. And I want to thank all the witnesses for taking time out of their busy schedule to testify before us today. I'm grateful to have such a wonderful community here in my own district.

As you may know, our Committee has jurisdiction of essentially all non-defense and non-medical research and development activities in the nation. This includes oversight of agencies like NASA, the Department of Energy's Office of Science, the National Oceanic and Atmospheric Administration. That's NOAA, which includes the National Weather Service, portions of the Department of Homeland Security, the National Institute of Standards and Technology, and the National Science Foundation, which provides approximately 40 percent of all non-medical basic research at American colleges and universities, including support for STEM education.

And I'm pleased and honored that Dr. Cora Marrett, Deputy Director of the National Science Foundation, could be with us here today. Thank you very much. Dr. Marrett attended one of our very first hearings here at the Marshall Elementary School three years ago; and we're honored to have her back today to discuss the important role of NSF in helping promote STEM education and careers.

STEM education and a trained, skilled workforce are very closely connected, and all or both are very essential elements for U.S. economic prosperity. They should be a top priority for every community, much less—and an awful lot like they do here in Texarkana. We're a pattern they could follow. Not only do community colleges make up almost half of all the U.S. graduates, but they also create a pathway to four-year universities. And through valuable partnerships with business, industry, other schools and local government and economic development entities, these help to create a competitive and economically successful community.

I was in the Texas Senate for ten years before going to Congress, and I think one of the most important bills we passed there was the Community College Concept. And there's a story behind it because you had to know the makeup of the Senate at that time. We were even a divided Senate then. Though there was one republican, all the rest of us were democrats, but we still were divided. And we were especially divided in San Antonio because the Senate—the Senator there was Senator Red Berry, whose background had been that he was a driver for Al Capone when he was younger. And then

a professor there, Professor Bernal, they would not vote together. They would not vote alike. And they voted one after the other. Bernal voted first because we voted alphabetically and then Berry. And keep in mind they would not vote alike. And we had to promise—it was a close vote. It was tied 15 to 15. I had Bernal promise me that he would vote for it, and I had Red Berry promise me that he would vote for it. When we got to their line, Bernal voted first. He voted for it. And when Red Berry saw he voted for it, he naturally voted against it. And we lost the first vote. And then we had to sit Red Berry down and teach him how to renew the vote by which the vote was taken, had to write it out for him because he had to do it because he voted in the majority. He did that. And I had to go over and hold Bernal's hand to get him to pass and let Red go ahead and vote. And he voted, and then came back and voted. And it was 16 to 15 is the way this passed. And I think it's probably one of the most meaningful and important legislation in the ten years I was down there, because it did a lot of things that we'll all be discussing later. But the thing it did for me, I got to keep my kids in the home two years longer and let them go to junior college there on the edge of Dallas.

But I know that, and I've had the opportunity to learn about the Texarkana community efforts behind the creation of the Martha & Josh Morriss Mathematics & Engineering Elementary School and their generosity at the field hearings three years ago. And I'm so impressed with all of you and what you've done here, and I look forward to learning your postsecondary education efforts to fulfill your workforce needs and the role each of you play in accomplishing this important feat. And I thank you again for being with us today.

I have used my five minutes. Was I exactly on five minutes? And we want to stay within that because we have those of you who have to catch transportation out of here at noon. I think we're going to stay pretty close.

Chair now recognizes Mrs. Johnson for an opening statement. I've explained to you that she's the lead Democrat on the entire Committee. She is what they call Ranking Member.

Ms. Johnson, thank you. I recognize you for five minutes.

[The prepared statement of Chairman Hall follows:]

PREPARED STATEMENT OF CHAIRMAN RALPH M. HALL

Good Morning. I want to welcome everyone this morning to the Committee on Science, Space, and Technology Field Hearing on STEM Education in Action: Communities Preparing for Jobs of the Future. I had the pleasure of hosting a Field Hearing in Texarkana three years ago, and it is my pleasure to return as Chairman of the Committee for our second field hearing to explore the challenges of promoting science, technology, engineering, and math (STEM) education for our students.

I would like to officially welcome our Committee's Ranking Democratic Member and my good friend, Eddie Bernice Johnson, to the fourth district of Texas and to thank her for making the journey for this important hearing. I know we are both glad to be Members representing this great state, and STEM education has been a top priority for both of us on this Committee.

I would like to also thank the Texarkana Independent School District for providing the use of this wonderful new building and auditorium for our hearing, and I want to thank all of the witnesses for taking time out of their busy schedules to testify before us today. I am grateful to have such a wonderful community here in my own district.

As you may know, our Committee has jurisdiction of essentially all non-defense and non-medical research and development activities of the Nation. This includes

oversight of agencies like NASA; the Department of Energy's Office of Science; the National Oceanic and Atmospheric Administration, which includes the National Weather Service; portions of the Department of Homeland Security; the National Institute of Standards and Technology; and the National Science Foundation, which provides approximately 40 percent of all non-medical basic research at American colleges and universities, including support for STEM education.

I am pleased and honored that Dr. Cora Marrett, Deputy Director of the National Science Foundation, could be with us today. Dr. Marrett attended our first field hearing at Morriss Elementary School three years ago, and we are honored to have her back today to discuss the important role of NSF in helping promote STEM education and careers.

STEM education and a trained, skilled workforce are closely connected and are both essential elements for U.S. economic prosperity. They should be a top priority for every community, much like they are here in Texarkana. Not only do community colleges make up almost half of all U.S. undergraduates, but they also create a pathway to four-year universities. Through valuable partnerships with businesses, industry, other schools and local government and economic development entities, these help to create a competitive and economically successful community.

I had the opportunity of learning about the Texarkana community efforts behind the creation of the Martha and Josh Morriss Mathematics & Engineering Elementary School at the field hearing three ago. I am so impressed with all that you are doing here, and I look forward to learning of your post-secondary education efforts to fulfill your workforce needs and the role each of you play in accomplishing this important feat. Thank you all again for joining us today.

Ms. JOHNSON. Thank you very much, Mr. Hall. And I'm delighted that you've called this meeting here in Texarkana. It's a little challenge to get here, but it's always nice to visit. It's a very nice town, and I want to thank the Texarkanians for ordering this welcome this morning.

We hope that we will leave with information that will address successful STEM partnerships in the region, and discuss the unique role of community colleges in both strengthening the local technical workforce and providing a pathway to continued education in the STEM fields. We do have a STEM education crisis in this country, and we must do something to address it if we hope to compete in the 21st century and the global economy. Year after year, test after test, our students are lagging behind their international peers in tests of science and math. The most recent National Assessment of Education Progress study found that less than half of our nation's students are demonstrating solid academic performances and proficiency in science. This is a startling statistic when you consider the many recent reports warning that our competitive edge will be lost if we do not vastly improve STEM education in this country. More and more U.S. companies are moving abroad. We think this is because of trade, but it's because they cannot find the highly skilled workforce they need here at home. A recent study estimates that in the year 2018, 8 million jobs in the U.S. economy will require a college degree in one of the STEM fields. If we want these jobs to stay here in the U.S. and in Texas, we must continue to invest in STEM education for our future workforce.

The STEM education problem is a complex one that no entity alone can solve. There is a role for all key stateholders, including federal and state governments, local school districts, higher education and formal education organizations and industry. The role of community colleges in particular is increasingly becoming a part of the national competitiveness conversation. Community colleges have an important role to play in preparing students for highly

technical jobs upon graduation and in providing a pathway for higher education in STEM fields. For many students, community colleges can be more affordable and accessible than a four-year institution. Additionally, community colleges are highly diverse institutions with great potential to stimulate interest in STEM among other historically underrepresented groups. Many minority students with great potential for success in STEM disciplines begin their postsecondary education in a community college.

I'm interested in hearing from the witnesses today about the role they see community colleges playing in broadening participation in STEM and what experiences they've had in promoting diversity in local community college and STEM programs.

We also know that community colleges face unique challenges, including issues of K through 12 math and science remediation. I am interested in hearing from witnesses about how partnerships with K through 12 students' schools and other efforts that have helped to address this issue.

In reviewing the written testimony of the witnesses, I notice that many of you have received federal grants and partnered with many of the federal agencies. Especially in these tough budget times, it is critical that we continue to invest in federal programs that leverage resources locally and can be sustained long after the initial federal support. We just must do more with less. I'd be interested in hearing from our witnesses about what federal support your institution has received, what made you decide to seek out federal funding and what impact federal grants and partnerships have had in helping to create and grow effective STEM programs in East Texas.

To truly tackle the STEM education challenge, we need the involvement of all stakeholders, of entire communities. I look forward to hearing more about the great success you are having in this region and to learning from your experience here in Texarkana.

I thank you, Mr. Chairman, and I yield back.

[The prepared statement of Ms. Johnson follows:]

PREPARED STATEMENT OF RANKING MEMBER EDDIE BERNICE JOHNSON

Thank you, Mr. Chairman. I'm happy to be here in Texarkana to learn more about successful STEM partnerships in the region and to discuss the unique role of community colleges in both strengthening the local technical workforce and providing a pathway to continued education in the STEM fields.

We have a STEM education crisis in this country and we must do something to address it if we hope to compete in the 21st century global economy. Year after year, test after test, our students are lagging behind their international peers in tests of science and math aptitude.

The most recent National Assessment of Educational Progress (NAEP) study found that less than half of our Nation's students are demonstrating solid academic performance and proficiency in science. This is a startling statistic when you consider the many recent reports warning that our competitive edge will be lost if we do not vastly improve STEM education in this country.

More and more U.S. companies are moving abroad because they can't find the highly skilled workforce they need here at home. A recent study estimates that in the year 2018, 8 million jobs in the U.S. economy will require a college degree in one of the STEM fields. If we want those jobs to stay in the U.S., and in Texas, we must continue to invest in STEM education for our future workforce.

The STEM education problem is a complex one that no one entity alone can solve. There is a role for all the key stakeholders, including federal and state governments, local school districts, higher education, informal education organizations, and industry.

The role of community colleges in particular is increasingly becoming a part of the national competitiveness conversation. Community colleges have an important

role to play in preparing students for highly technical jobs upon graduation, and in providing a pathway for higher education in the STEM fields. For many students, community colleges can be more affordable and accessible than four year institutions. Additionally, community colleges are often highly diverse institutions with great potential to stimulate interest in STEM among historically underrepresented groups.

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To truly tackle this STEM education challenge we need the involvement of all stakeholders and of entire communities. I look forward to hearing more about the great success you are having in this region, and to learning from your experience here in Texarkana.

Chairman HALL. I think this thing works now. That's what I think.

And I thank you, Ms. Johnson. The gentlelady from Texas yields back.

At this time, I want to introduce our first panel of witnesses and stress the importance of trying to stay within five minutes, if you can, but, of course, we're not going to hit the gavel on you no matter how much time you take because we're too grateful to you for being here. But time is important, and it's important kind of like it was to a fellow who was going to heaven and he was talking to Saint Peter, trying to tell him why he ought to let him in. He said, "Well, why should you go to heaven?" And he said, "Well, I've done a lot of good things for good people." He said, "Well, name me some of them." He said, "Well, for instance," he said, "I was driving down the highway and I looked over there and I saw a bunch of motorcycles. And I saw guys with tattoos all of them, and they had a little farm girl about 19—18, 19 years. They were pushing her from to the other, and they were hugging her, and then pushing her on." And he said, "I walked over there and got her and put her behind me. And I got the leader and I slapped him in the face three or four times. I jerked a ring out of his ear. And I said, "Now any of the rest of you want some of this?" And Saint Peter said, "Well, when did all that happen?" He said, "About 15 minutes ago."

We won't hold you that close, but we want you to stay with the time, if you can.

At this time, I'd like to introduce our first panel of witnesses. Our first witness, as I've already acknowledged, is Dr. Cora Marrett, Deputy Director, National Science Foundation.

Dr. Marrett, let me express how much we're really looking forward to the upcoming NSF day at Texas A&M Commerce on November 14th.

For our academic witnesses today and for any other college representatives who may be in the audience, NSF will be in town to host a workshop on the programs they fund and to assist schools in learning how to apply for grants. And that's a lot of what will come out of this hearing today, the instructions on how to do that. I encourage all of you to put that date on your calendar.

Our second witness is Mr. James Henry Russell, President of Texarkana College. We call him James Henry—full first and second name here in East Texas. To my wife I'm Ralph Moody Hall, but she never called me Ralph Moody unless she was mad at me—but they call you James Henry, don't they, all the time?

He's President of Texarkana College. He's also worked with the Texas Independent School District for 17 years before he served a number of positions, including superintendent.

Our third witness is Dr. Brad Johnson, President of Northeast Texas Community College. He, too, has 17 years of education experience. And how important education is, it's important to prevent mobs in the streets and petitions to federal courts. That's what education is, teaching us how to be together and how to live together and set examples for the young people that you're teaching.

And you've worked in various roles from educator to administrator and development office. We thank you for being here.

This is written "our final witness." I don't like to ever say "our final witness." I'm the oldest guy in Congress. I'm 88 years old, and my kids say, "Papa, doesn't it hurt you to say, are you really 88 years old?" And I tell them it sounds better than, "Don't he look natural?"

But that's our final witness for today, and that's what I always want to say, for this panel, Dr. C.B. Rathburn, President of Texas A&M University in Texarkana. He's married to Adrienne. I had dinner with them last night, and I love this couple. And I appreciate everything they do. Dr. Rathburn was previously president of Savannah Technical College in Georgia, for over seven years.

And as our witnesses know, spoken testimony is limited to five minutes, after which, the Members of the Committee will have five minutes each to ask questions.

I now recognize our first witness, Dr. Marrett, for five minutes to present your testimony, and thank you.

STATEMENT OF DR. CORA MARRETT, DEPUTY DIRECTOR, NATIONAL SCIENCE FOUNDATION

Dr. MARRETT. Thank you. Thank you very much, Chairman Hall and to Ranking Member Johnson, the distinguished members of the panel, the audience, very distinguished audience. I am very pleased to be here today to speak to you about community colleges and the role that the National Science Foundation plays in supporting the important mission of community colleges to U.S. education. As you know, the National Science Foundation, or NSF, is the primary federal agency supporting research at the frontiers of knowledge across all fields of science and engineering and at all levels of education in science, technology, engineering, and mathematics, or STEM. NSF's mission, vision and goals are designed to maintain and strengthen the vitality of U.S. science and engineering, both in research and education. For after all, research and

education fuel the innovation on which the nation builds. The intersection of research and education advance U.S. global leadership and cultivate a reserve of human capital and talent, something we both know so well.

This reserve enables the U.S. to respond rapidly and effectively to a range of anticipated and unexpected national challenges. This occurs through the contributions made to communities often through community colleges, for community colleges are essential for community development.

It is a pleasure to be in the 4th Congressional District of Texas, and to be back, I should say, to the district, for this is home to several outstanding institutions of education at every level. But one route to this leadership is through community colleges. As you well know, these institutions provide a gateway to millions of Americans to good jobs and a better life. They also lead to STEM careers and here are a few facts: One, is that community colleges are an increasingly important part of the education landscape. In 2010, some 8 million students were enrolled in the nation's nearly 1200 community colleges. It is also the case that community colleges focus on teaching and they respond to educational and workforce needs of local communities. Even though community colleges have some of the highest teaching loads across higher education, the class sizes are generally smaller, giving students the opportunity then for significant faculty contact.

As Ranking Member Johnson noted, another fact about community colleges is that they are diverse, and indeed, it's this appeal to a broad range of students that holds promise to diversify the STEM workforce of the nation. This diversification will help the nation sustain our leadership in science, technology, engineering and mathematics, leadership that is critical in the increasingly competitive global economy we face.

Another fact about community colleges, community colleges are a bargain and they're accessible. And finally, community colleges prepare workers for important jobs. As already noted, the jobs that are emerging are jobs that require skills, especially middle level skills, and these are the skills that community colleges help support. NSF then recognizes the value of community colleges for STEM fields. We've made our budget request for 2012 and really hope that we'll be able to invest over a hundred million dollars in projects for 2012, projects that will focus on STEM career pathways. These would include technician education, entry into four-year institutions and investments that will build knowledge about how successfully to achieve the goals. Time does not allow me to elaborate on our plans, so I encourage you to read my complete written statement to learn more about NSF's very important and successful STEM programs, including the Advanced Technological Education Program, or ATE, which has been our primary source of support for engagement with community colleges. I've indicated today about the support of the ATE program to various parts of Texas, and the community college system of Texas. The testimony identifies two programs that are supported through other parts of the National Science Foundation. Our efforts to support community colleges through the ATE program span renewable energy, welding, analyzer technician opportunities, cyber security and general

STEM forces that all lead into technician education and professional development for students and faculty.

In conclusion, let me note that community colleges contribute a great deal to the STEM education pathway and workforce. Not only is NSF committed, but takes seriously our role to ensure the continued success of community colleges. It is then my pleasure, my privilege, not only to come to share developments at the National Science Foundation, but to learn of those taking place in this region and to determine or help determine what might be even more effective ways in which the National Science Foundation can play the role that it's been given to advance research and education across all fields of science and engineering. So I thank you again for the invitation. I thank everybody for the time, and I will, when appropriate, welcome any questions that might be made of me. Thank you.

[The prepared statement of Ms. Marrett follows:]

PREPARED STATEMENT OF DR. CORA MARRETT, DEPUTY DIRECTOR, NATIONAL SCIENCE FOUNDATION

Chairman Hall and distinguished Members of the Committee, I am pleased to be here today to speak with you about community colleges and the role that the National Science Foundation (NSF) plays in supporting their important mission in U.S. education. As you know, NSF is the primary federal agency supporting research at the frontiers of knowledge, across all fields of science and engineering and at all levels of education in science, technology, engineering and mathematics (STEM). Its mission, vision, and goals are designed to maintain and strengthen the vitality of the U.S. science and engineering enterprise. As part of the overall national R&D enterprise, the basic research and education activities supported by NSF are vital and integrated components that enable the United States to advance economically, and they provide the know-how to allow the nation to respond rapidly and effectively to a range of anticipated and unexpected challenges. Communities and community colleges are an essential element of this NSF enterprise.

It is also a pleasure to be in the Fourth Congressional District of Texas, home of several outstanding institutions of higher education. As Congressman Hall's website states,

- In recent years, a growing consensus has emerged regarding the importance of science, technology, and innovation as the key driver of long-term economic growth and improved quality of life in America. Technological progress fueled by investments in research and development is estimated to be responsible for as much as half of U.S. economic growth since World War II. It is critical that we continue our efforts in STEM education to ensure that the next generation of high-tech industries and products are developed by researchers in the United States. America has always been the leader in cutting edge technology and innovation—and we must do all we can to ensure our strong footing as a global economic leader.

One route to this leadership travels through community colleges. As President Barack Obama noted at an October 2010 White House Summit on community colleges, these institutions provide "a gateway to millions of Americans to good jobs and a better life." They also often lead to science, technology, engineering, and mathematics (STEM) careers. Before discussing NSF's investment in community colleges, it might be helpful to remind ourselves of a few facts about this increasingly important sector of the education system:

- **Community colleges are an increasingly important part of the education landscape.** According to American Association of Community Colleges (AACC) statistics, in 2010 there were 1,173 community colleges in the U.S. enrolling 8 million students (43% of all students in postsecondary education). Community colleges awarded 605,267 associate's degrees and 325,452 certificates in 2010.
- **Community colleges focus on teaching.** The community college mission focuses on teaching, and these institutions respond to the educational and workforce needs of their local communities. However, some community college fac-

ulty maintain undergraduate research programs, and more faculty are using research as a learning tool in community colleges (Cejda and Hensel, 2009. *Undergraduate Research at Community Colleges, Council on Undergraduate Research*). Community college faculty have the highest teaching loads in all of higher education, and there are no graduate or upper division students to serve as teaching assistants. However, class sizes are generally small, and students have significant contact hours with faculty. Students who transfer from a community college to a four-year institution generally perform at least as well or better than the students who began their college experience on the four-year campus.

- **Community colleges are diverse.** Community colleges attract a broader range of students in terms of race, gender, age, veteran status, working status, and first-generation college attendees than other higher education sectors. Community college student populations thus better align with racial/ethnic proportions within the general U.S. population and hold promise to help diversify the STEM workforce and tap the nation's entire human capital talent base. With 95% of community colleges having open admissions, they provide a pathway for many Americans to academic certificates, associate degrees, and transition to four-year institutions, and to realizing the American dream.
- **Community colleges are a bargain and are accessible.** According to the College Board, tuition and fees at community colleges in 2009–10 averaged $2,544, compared to four-year public schools at $7,020 for in-state and $18,548 for out-of-state, and compared to $26,273 for private not-for-profit four-year schools, and $14,174 for for-profit four-year schools. In fact, the College Board report noted that the net cost of community college—after subtracting grant aid—was negative, so many students are not paying even the modest $2,544 total. In 2007–2008, 62% of community college graduates graduated from public two-year schools without debt, and another 23% had borrowed less than $10,000. In addition, 95% of the American population lives within 25 miles of a community college.
- **Community colleges prepare workers for important jobs.** According to a National Governors Association Issue Brief, titled "Using Community Colleges to Build a STEM–Skilled Workforce" (June 24, 2011), it is estimated that between the years 2008 and 2018 nearly 47 million anticipated "middle skill" jobs will open; 64% of these will require at least some college education and strong basic skills in math, science, and other technical areas.
- **There is increasing research interest in the value and potential of community colleges.** For example, a special issue in 2010 of the *Journal of Women and Minorities in Science and Engineering* was devoted exclusively to the "Role of Community Colleges: Broadening Participation among Women and Minorities in STEM." The objectives were to: "(1) Address the diverse functions of community colleges and their roles in providing access and opportunity for women and ethnic minorities to pursue STEM education, (2) Understand the role of community colleges as a pathway to a baccalaureate degree and beyond in STEM fields, (3) Investigate the role of career and technical education programs in community colleges in educating and training the 21st century workforce," and (4) discuss implications for policy and practice, and future research.

NSF recognizes the valuable services that community colleges provide for the nation, especially in STEM fields. As stated in its FY 2012 Budget Request to Congress, NSF plans to expand and strengthen its efforts to engage community colleges through many of its programs; the Directorate for Education and Human Resources, for example, is hoping to invest $100,000,000 in community college projects in 2012. These investments will focus on STEM career pathways including technician education and entry into four-year institutions as well as build knowledge about how to successfully achieve these goals.

The Advanced Technological Education Program

NSF's Advanced Technological Education (ATE) Program has historically been the primary program for engagement with community colleges. In 2011 NSF introduced systematic coordination of ATE program expertise with a number of other programs in the Directorate for Education and Human Resources (EHR). The ATE program, which has been in place since 1994, is the core community college activity at NSF, bringing coherence and synergy to other relevant undergraduate education programs within EHR. It aims to prepare the next generation of technicians for tomorrow's STEM workforce, so in this sense the focus is very specific. The ATE program currently supports proposals in three major tracks: ATE Projects, ATE Centers, and

Targeted Research in Technician Education. In ATE Projects and Centers, two-year colleges have a leadership role and work in partnership with business and industry, universities, secondary schools, and government agencies to design and carry out model workforce development initiatives. The Targeted Research in Technician Education program supports research on technician education, employment trends, the changing role of technicians in the workplace, and other topics that advance the knowledge base needed to make technician education programs more effective and more forward-looking. Fields of technology supported by the ATE Program include, but are not limited to: agricultural technology, biotechnology, chemical technology, civil and construction technology, computer and information technology, cybersecurity and forensics, electronics, energy (both traditional and renewable) environmental technology, geospatial technology, manufacturing and engineering technology, marine technology multimedia technology, nanotechnology, telecommunications, and transportation technology. Given this breadth of coverage, ATE will be in a position to work across disciplines and programs to expand the qualified applicant pool of community colleges through expanded outreach, capacity building, and knowledge building activities. The ATE leadership continues to develop ways to attract new institutions to the program. One such activity is the inclusion in the ATE solicitation of a focus area for institutions that have either never submitted a proposal to ATE or have not submitted a proposal in ten years. Over the four years that this focus area has been available, approximately 120 new institutions have submitted proposals to the ATE program.

The ATE program has supported 61 awards within the state of Texas since its inception. Currently, there are 12 active awards, and one of the ATE Centers, the Convergence Technology Center, is housed at Collin County Community College. ATE also supports the ATE Center, GeoTech, at Del Mar College as well as a range of projects in Texas that span renewable energy, welding, analyzer technician opportunities, cybersecurity, general STEM courses that lead into technician education programs, and professional development opportunities for faculty. The ATE television project (see http://www.atetv.org/) recently posted its first episode of the season (on biotechnology). It highlights ATE active awards and provides insights into specific career paths. The webpage includes links to related episodes, information for parents, students and educators, links to the ATE Centers, an active blog and information other resources.

Enhancing capacity for community colleges is a priority across the Foundation. Nearly all of the directorates have programs or activities that include a community college focus. For example, the Directorate for Geosciences has supported a community workshop for faculty from two-year colleges that led to creation of a centralized resources website (Carleton.edu/geo2yc), and for the past two years has funded travel grants for faculty and students from two-year schools to attend the annual meeting of the Geological Society of America. In the Engineering Directorate, the Research Experiences for Teachers (RET) program includes community colleges, and community colleges are among the partners in the large Engineering Research Centers. Across NSF key drivers for community college activities include:

Serving the needs of underrepresented minorities: According to a July 2011 NSF National Center for Science and Engineering Statistics (NCSES) *InfoBrief*, women were more likely than men to have taken community college courses. In addition, among science, engineering, and health (SEH) bachelor degree recipients in 2006 and 2007, 56% of Asians, 57% of blacks, 59% of Hispanics, 68% of American Indians/Alaska Natives, and 50% of whites had attended community colleges. According to a 2005 National Research Council (NRC) study, "in effect, community colleges have become an educational pipeline for underrepresented minorities entering the higher education system." [1] According to the Institute for Higher Education Policy, "Community colleges provide vital access to low-income students by offering affordable education, open enrollment, course convenience, and geographic proximity." NSF's Louis Stokes Alliances for Minority Participation (LSAMP) program focuses on preparing community college students to transfer to four-year baccalaureate-producing institutions. The goal for these students is to become STEM B.S. recipients and ultimately progress to graduate studies in STEM disciplines.

Another example of NSF's interest in community colleges is the Tribal Colleges and Universities Program (TCUP), which was established in 2001 to provide support for increased capacity for STEM educational programs in the Nation's tribal colleges, as well as many Alaska Native and Native Hawaiian-serving institu-

[1] National Research Council, 2005. Enhancing the Community College Pathway to Engineering Careers.

tions of higher education. The TCUP eligibility pool includes over 40 institutions, many of which are in remote geographic areas, and most of which serve students in economically disadvantaged regions. Although the program emphasized information technology in its early days, it has evolved to support new degree programs in mathematics, science, pre-engineering, and, recently, engineering. Several of the two-year colleges that comprise the majority of the TCUP pool now offer four-year degrees in STEM fields such as computer engineering and environmental science—degrees with cultural relevance and local significance, as the students can graduate while remaining near home, and are then competitive for jobs in these fields that traditionally have gone to others outside the communities. The investment back in the community made by these graduates is incalculable.

Providing pathways for STEM careers: NSF's NCSES reports that "over the academic years (AY) 2001 to 2007, the percentage of SEH graduates who had ever attended community college at some point in their studies remained fairly steady, at around 50% for bachelor's degree recipient and just under 45% for master's degree recipients." Many students enrolling in community colleges enter with specified STEM career goals, but find they lack the foundational skills needed to be successful. NSF will coordinate across programs that support community colleges to facilitate the implementation of successful models for developmental education. For example, the Bridge to Biotech program at the City College of San Francisco was developed with funds from NSF's Course, Curriculum and Laboratory Improvement (CCLI) program, which is now called Transforming Undergraduate Education in Science, Technology, Engineering and Mathematics (TUES). The San Francisco program is currently being adapted and implemented at other community colleges. NSF is hoping to coordinate with private foundations in this effort.

Building the foundation for future STEM teachers: According to a recent report, "more than 20% of all teachers begin their college careers at two-year institutions and nearly half of all teachers complete some of their science or mathematics courses there." [2] Therefore, building strong STEM courses that articulate with four-year teacher preparation programs is vital in the preparation of a strong teaching workforce. Through its programs that focus on preparing teachers, such as NSF's Robert Noyce Teacher Scholarship program (NOYCE) and the proposed Teacher Learning for the Future (TLF) program, NSF will support efforts to build collaborations between two-year and four-year teacher training programs with a goal of helping to both increase the number of qualified teachers in pursuit of the Administration's goal—to increase the number of college graduates by 50%—and to study the need for and to develop approaches for teacher training necessary for the 21st century. The ATE program also supports teacher education efforts, and a recent award is increasing the ability of secondary STEM teachers and students to learn collaboratively and apply STEM skills using information and communications technology (ICT). The project is housed in the National Center for Teacher Education (NCTE), a part of the Maricopa Community Colleges District.

Ensuring smooth critical transitions: Transitions from secondary school to two-year colleges and from two-year colleges to four-year colleges are especially challenging in STEM fields. For example, recent work by the Carnegie Foundation for the Advancement of Teaching focuses on the serious issues in the mathematics preparation of community college students: "Many students who attend community college begin unprepared to succeed in mathematics... Students are more likely to fail developmental mathematics than any other courses in higher education. Failure rates in individual developmental courses exceed 35%, and two-thirds of students fail to complete the entire sequence of courses to which they are referred." (See http://www.carnegiefoundation.org/problem-solving/developmental-math).

At NSF, programs will coordinate their efforts to study key transitions and develop mechanisms to help students succeed in negotiating them. The National Academy of Sciences has received funding from ATE to conduct a study beginning in 2011 on the changing and evolving dynamic between two-year and four-year colleges and universities. Pathways through community colleges to STEM careers as well as transitions and articulations from secondary schools to community colleges and community colleges to four-year institutions are expected to

[2] National Association of Community College Teacher Education Programs, 2008. *The State of Affairs: Impacts and Implications of STEM Teacher Education at Two-Year Colleges.*

be focus areas of this study. Results of the study will inform and support education pathways across educational levels and inform NSF's planning activities for community colleges.

Boosting graduation rates: NSF will play a role in addressing the President's 2020 goal of producing the highest proportion of college graduates of any country by helping to increase the graduation rate of recipients of both associate and baccalaureate degrees in STEM disciplines. In addition to the strategies enumerated above, NSF will encourage proposals to its STEM education research programs that focus on better understanding matters such as the competencies needed by STEM students for successful transfer from two-year to four-year institutions; the performance of community college transfers compared to students who matriculate at four-year institutions; and the elements that contribute to student success and desire for STEM careers among community college students.

Conclusion

Clearly, community colleges contribute a great deal to the STEM education pathway and resulting workforce. NSF remains committed to helping to ensure their continued success.

Mr. Chairman, I want to thank you very much for holding this important hearing, and inviting me to testify. I would be pleased to answer any questions you may have.

Chairman HALL. And I thank you. I thank you for your time, your own time. Thanks a lot.

Your entire speech will be in the record for the Committee and for the Congressional record, and thank you for that.

I now recognize what it says here, Mr. Russell, but I recognize James Henry—I've met him; I call him James Henry, and that's what everybody else calls him here—for five minutes to present his testimony.

James Henry, thank you.

STATEMENT OF MR. JAMES HENRY RUSSELL, PRESIDENT, TEXARKANA COLLEGE

Mr. RUSSELL. Chairman Hall and Ranking Member Johnson, first of all, thank you for taking the time out of your very busy schedule to talk with us here in Texarkana today. It is quite an honor to have all of you here.

STEM education has made a major impact on this community over the last few years. I believe this community has prided itself on, not just putting a sign up on a building declaring STEM education, but actually changing what we do inside to prove that we are taking that to heart. I think you would be very proud of what you would see if you would walk through any of the STEM programs throughout the Texarkana community today.

I am going to quickly address some of the topics that were sent to me last week. The first relates to how Texarkana College is helping the U.S. economy with STEM education. Texarkana College has been a vital part of this community since 1927. We currently offer a wide variety of STEM pathways in both the academic and workforce education areas. Approximately 50 percent of our most recent graduates or students that earn certificates did so in an area of STEM education. How we might help out the economy more than anywhere, though, is providing it in such an efficient way. The demand for community college services, as has been mentioned, is growing throughout this entire country. Students graduating today have way too much of a debt burden on them. We are so lucky in

this area to have such efficient community colleges and one of the best-priced four-year universities that you're going to find anywhere in the nation. We are very lucky in the Texarkana area to have first class educational opportunities, but also to have them in such an efficient offering.

Collaboration in STEM is another area that shines in our region. It is amazing what can be accomplished when you focus on student success, and that is what is happening in this area. Our Pre-K through 16 council in this area is one of the most productive that you will find anywhere. I want to highlight a new partnership that shows collaboration in the STEM area. Texarkana College recently opened a new facility at the TexAmericas Center. You'll hear a lot more about TexAmericas in just a few minutes. This facility will provide both academic and workforce opportunities. It is located right in the middle of our largest employer and has 20,000 acres available for future plans. This facility was put there to train our current workforce and to be ready to quickly adapt to provide training for any need that comes up in the future. The majority of the jobs in this area are STEM related at TC at TexAmericas. Our first training class graduated just two weeks ago, and listen to the partners that were involved in this: Texarkana College, TexAmericas Center, the United States Army, Texarkana Chamber of Commerce and Caterpillar Corporation. That's the very first, it's only been open for a month, and I can't wait to report on what the future holds.

I want to move now to obstacles to students receiving STEM degrees and certificates. The number one obstacle that I see relates to students being ready for math their first year of college. Study after study will tell you that if a student is not successful in a college level math class that first year, the chance of them ever earning a degree or certificate dramatically goes down. Professional development, in my opinion, is one of the key ways that we can improve this in the future. There are many professional educators in this community that deserve to be in the record, but at the time, I want to highlight two, and hopefully they will be contacted. Rhonda Jameson with the Texarkana Independent School District and Jamie Ashby with Texarkana College are two incredible women that are doing a great job in this community changing the way that we teach in the classroom, and they can show a lot of people how to get STEM education relevant in the classroom.

Ms. Johnson, I was very impressed to see on your website that you post an annual Science & Technology BrainTrust to highlight real life examples to students, and that is what we've got to have at such an early age. It has to be relevant to our students. One of the past speakers that you had was Dr. Ben Carson. He is one that we have studied for many years in Texarkana and would be thrilled to have him here, if you could ever help us with that. We sure would appreciate it.

A passion and focus of several of us in this community has been to get more STEM graduates and for those graduates to reflect the diversity of this community. I have worked with a group called the Texas High School Project for the past four years. They are part of the Community Foundations of Texas and have been instrumental in bringing about quality STEM education in school dis-

tricts across Texas, the past few years. And their headquarters is—Ms. Johnson, it may be in your area and it's very close to Congressman Hall's.

I am very excited that they are soon announcing that they are moving to the community college realm. You will soon be hearing about staffable credentials and ways students can move in and out of a college environment while they move up in their earning opportunities. Students in today's world must have the opportunity to attend college for a short period of time, earn something, get a better job, come back, stack something else on top and get a better job. The traditional student life is changing, and we've got to have opportunities that meet for all. Texas High School Project, Dr. Reo Pruiett, an incredible great organization to learn from on quality STEM education. They have been an accelerator for STEM in the Texarkana area.

Congressman Hall, in closing, I want to tell you thank you for what you have done for STEM education in this area. I have been just as excited as the kids every time you have brought an astronaut to Texarkana to inspire us. I love attending every Eagle Scout ceremony that you do. You always refer to somehow that it was Eagle Scouts that took this country to the moon and back in the '60s. If you looked at the front page of the Texarkana Gazette yesterday, you will see our board of trustees last week in a training session, watched a video from 1962, at Rice University, where President Kennedy entered this country into the race for the moon. It's a race that I think we all know that we won. It shows how important STEM education has been in the past to this country, and I think we all know that it is going to be the driver for the future.

Chairman Hall and Ranking Member Johnson, thank you so much again for coming to Texarkana. Thank you for your support for STEM education. We look forward to working with you in the future.

[The prepared statement of Mr. Russell follows:]

PREPARED STATEMENT OF MR. JAMES HENRY RUSELL, PRESIDENT, TEXARKANA COLLEGE

Opening Remarks and History of Institution

Texarkana College is an institution that has been a vital part of the Texarkana Community since 1927. During this almost century of service, Texarkana College has been the leader in post-secondary education in this area and has been the conduit for so many first time college students to break free from the straps of poverty and achieve something that truly opened doors many thought would never be possible. The role of Texarkana College has been, and continues to be, to provide the path to educational opportunity for a recent high school graduate, laid off worker, or someone that simply wants a better life or a new skill. Texarkana College's motto for the last few years has been that it is, "A Great Place to Start or to Start Over."

TC has a history of leadership, from our faculty to our former and current student body, of excellence in STEM education. "Man in his quest of knowledge and progress is determined and cannot be deterred." "Great tasks are accompanied with great difficulty." These are two of my favorite quotes from our President, John F. Kennedy, from his September 12, 1962 speech entering America into the race to the moon. In that speech, he stated that we must have the courage to overcome obstacles; he stated that we must pursue tasks not because they are easy but because they are hard. Texarkana College was a trailblazer in the fields of Science and Math even before the term "STEM" was ever coined—not because it was easy, but because it has been and continues to be our mission to prepare our students to overcome obstacles and achieve great things.

Collaborations throughout our history have included national partners such as the NASA-funded NOVA (NASA Opportunities for Visionary Academics) Grant and the U.S. Corps of Engineers as well as state and local governments. One of our most well-known graduates, H. Ross Perot, has been a virtual pioneer in STEM developments on the national front. Dr. Mary Witt Hughes, a graduate of TC from the 1930s, was blazing trails for women in science as an orthopedic surgeon. Another graduate, John Tyler, in 1981, was the first person in the world to establish a satellite radio network with his company Satellite Music Network. Today, a current lead engineer for the development of space suits for NASA, Mr. Terry Hill, is an example of another Texarkana native—from a local high school and former 1990s student of Texarkana College—who persevered to overcome barriers to achieve his dream of becoming an aero-space engineer.

Texarkana College was established in 1927 as a public junior college and as a branch of the Texarkana, Texas Public School Systems. The College experienced a slow but steady growth from 109 students in 1927 until the end of World War II at which time it became increasingly apparent that the growth in enrollment caused by returning veterans demanded expansion. Accordingly, a bond issue was included in a 1948 election to the tune of $40,000 to purchase a new campus and to finance construction. Twenty acres were purchased and construction of an administration building and gymnasium began in 1950. In October of 1951 the college relocated to its present site on Robison Road with an enrollment of 589 students.

Today, Texarkana College (TC) enrolls more than 10,000 individuals annually. The TC Mission Statement reads: Texarkana College prepares individuals for success in life by providing quality opportunities for workforce education and academic advancement. TC is a comprehensive community college located in the border city of Texarkana, TX and offers Associate and Applied Associate Degrees, Distance Education, Dual Credit, Workforce Education, Certificates, and Continuing Education courses. Since 1971, Texarkana College has collaborated with other post-secondary higher education institutions to provide seamless transfer of credit for students. Texas A&M University-Texarkana (TAMU–T) is our community partner and affords students with access to bachelor and graduate degree programs. TC's service areas consist of all of Bowie County, a large portion of Cass County and a small portion of Red River County in Texas. In addition, we are a border county with Miller County in Arkansas and serve these residents as well. TC is an open admission institution located in the twin cities of Texarkana, Texas/Arkansas serving a unique geographic area where four states (Texas, Arkansas, Louisiana, and Oklahoma) meet.

Our student profile is twenty-eight percent economically disadvantaged with seventy-five percent (75%) Caucasian, and twenty-five percent (25%) minorities. Sixty-one percent (61%) of students are younger than twenty-five and sixty-five percent (65%) are female. In FY 2010, 751 degrees and certificates were awarded. Of which 28.8% were awarded to minorities. Approximately sixty percent (60%) were part time enrollees with 40% enrolled full time; approximately 70% of our student population is enrolled in academic programs while 30% are in workforce education programs. Almost 83% of our total academic students are employed after graduation and/or go on to pursue a four-year degree. Graduates of our workforce education programs have a slightly higher rate with almost 85% employed and/or enrolled.

Texarkana College has made a commitment in the last two years to establishing a culture of evidence for the entire campus by becoming an Achieving the Dream institution. As we move forward, knowledge gained and information and data shared through this nationwide network of community colleges will be a driving factor in insuring that Texarkana College remains focused on fulfilling its mission: To prepare individuals for success in life by providing quality opportunities for workforce education and academic advancement. In May, 2011, Texarkana College was selected as one of the top 120 community colleges in the nation from over 1000 community colleges nationwide to compete in Round 2 of The Aspen Prize for Community College Excellence which seeks to accelerate efforts to improve community college student outcomes and shine a spotlight on community colleges that deliver exceptional student results through the development of high-quality measures and benchmarks for assessing student outcomes. Texarkana College is very proud to have been recognized and included in the Achieving the Dream and Aspen Prize community of institutions nationwide seeking to bring about transformation in community college student success.

Section I:Role of TC in the U.S. economy

Texarkana College has a solid working relationship with Workforce Solutions Northeast Texas, the regional office of the Texas Workforce Commission. Realizing that one of Texarkana College's greatest contributions to our regional economy is preparing a skilled workforce for our employers, the institution strives to promote

the attainment of certificates in technical fields that lead to employment in the local market. TC has proven that historically we have had great success in the award of certificates in technical fields that lead to jobs. TC students from the 2004–2005 graduating cohort receiving a certificate earn an average wage of $32,635. For students who graduated with an Associate's Degree from Texarkana College in 2004–2005, their 2010 Annualized earnings are $38,613.

The college takes an active role in collecting data on labor market training demands by participating and hosting regional planning summits with professionals from the fields of healthcare, advanced manufacturing and technology. The nine-county area served by Workforce Solutions Northeast Texas has a broad and diverse manufacturing base. One of the primary employers in this arena is the Red River Army Depot (RRAD). RRAD is located 18 miles west of Texarkana. The Depot, which was established in1941, repairs, and converts combat/tactical wheeled vehicles and operates the U.S. Department of Defense's only road wheel and track-shoe rebuild manufacturing facility. Many contractors support the work at RRAD including Day & Zimmerman, URS Corporation, Raytheon, M2 Services, BAE, and L–3 Corp. Adjacent to RRAD is the TexAmericas Center. In 1998, the Red River Redevelopment Authority was chartered as a Special Purpose District by the Texas Legislature to transform former military land and buildings into a privately held industrial park. This industrial park is now known as the TexAmericas Center. RRAD and its affiliated tenants at the TexAmericas Center currently employs 5,458 people, including federal civilian employees (3,403), tenant activities/workers (1,004), active duty military (3), workers employed by contractors (784) and 264 others not elsewhere classified.

TC recently established a 19,000 sq. ft. training center at the TexAmericas Center development park. With support from a recent Texas Military Preparedness grant funded through the Texas Governor's Office, this training center specializes in training dislocated and new workers in heavy equipment operation, mechanics, welding, machinery and related skills. Training at this site began in Summer, 2011. The skills being taught at this facility were identified in direct response to employers' request and include: robotics and process automation; instrumentation technology; Programmable Logic Controller; advanced welding/pulse welding; electromechanical, instrumentation and maintenance technologies (multi-craft), solid modeling and design, and integrated systems technology as well as diesel engine and transmission diagnostics and repair. These courses lead to certificates in the specified field and meet regional labor demand.

Texarkana USA serves as the medical technology and health care industry hub for the Ark-La-Tex region. In the 1950's, Texarkana College began the first Associate Degree Nursing program for community colleges in the State of Texas and was later the first community college in the nation to receive National League for Nursing accreditation. TC is a leading producer of highly trained nursing and EMT/Paramedic workforce personnel in the region. The TC Nursing Program has an above-average passing rate of 96% of students taking the Texas Board of Nursing licensure exam for Associate Degree Nursing (RN) and a 93% passing rate for Vocational Nursing students.

Section II:TC Collaborative Partners

Section II: TC Collaborative Partners

PARTNER ENTITY	KEY CONTACT NAME/TITLE AND EMAIL	DESCRIPTION OF PARTNERSHIP
Atlanta High School (TX) Avery High School (TX) Bloomburg H.S. (TX) DeKalb High School (TX) Fouke High School (AR) Hooks High School (TX) James Bowie H.S.(TX) Liberty-Eylau H.S. (TX) Linden-Kildare H. S. (TX) Maud High School (TX) McLeod High School (TX) New Boston H.S. (TX) Pleasant Grove H.S. (TX) Queen City H.S. (TX) Redwater H.S. (TX) Texas High School (TX) Arkansas High School (AR)	Counselor: Audrea Allen aallen@atlist.net Counselor: Brent Jackson brent.jackson@averyisd.net Counselor: Monique Irwin mirwin@bloomburgisd.net Counselor: Lea Dooley lea.dooley@dekalbisd.net Counselor: Mike Mack mmack@fouke.swsc.k12.ar.us Counselor: Chris Fountain fountain@hooksisd.net Counselor: Dru Driver ddriver@simmsisd.net Counselor: Pat Hearn pat.hearn@leisd.net Counselor: Stacey Alexander salexander@lkcisd.net Counselor: Paula Lewis plewis@maud.esc8.net Counselor: Nyla Dowd ndowd@mcleodisd.net Counselor: Paula Turner pturner@nbschools.net Counselor: LouAnne Smith lsmith@pgisd.net Counselor: Jana Scharnberg jscharnberg@qcisd.net Counselor: Hollie Collatt hcollat@redwaterisd.org Counselor: Stephanie Casteel stephanie.casteel@txkisd.net Counselor: Amanda McJunckins amanda.mcjunckins@tasd7.net	These are the K-12 institutions that serve as the primary partnerships
Texas Workforce Commission/ Workforce Solutions NE Texas	Kay O'Dell, kay.odell@twc.state.tx.us Executive Director	Workforce Solutions Northeast Texas provides referrals to our programs and provides training vouchers to eligible students.
Red River Army Depot	Lt. Col. Doyle Lassitter, Commander charles.lassitter@us.army.mil	Training partner and outreach to over 5,000 civilian Depot employees
Christus St. Michael Health Systems Wadley Regional Health System Reunion Nursing Home	Chris Karam, Christus St. Michael CEO chris.karam@christushealth.org Tom Gilbert, Wadley Health Systems CEO tgilbert@wadleyhealth.com	Regional hospitals partner with Texarkana College and provide preceptors for on-site nurse training. In addition, hospital CEOs serve on the College's strategic planning council.
Federal Corrections Institution (FCI)	Michael Carvahal; Warden; mcarvahal@bop.gov Patricia Comstock, Director of Educational Programs; pcomstock@bop.gov	Texarkana College instructors teach on-site at the Federal Correctional Institution to provide certificates in technical fields.
Texas A&M University-Texarkana	Dr. C.B. Rathburn, President Texas A&M University- Texarkana Carlisle.rathburn@tamut.edu	Reverse Transfer of Credit
Tex- Rep Community Theatre (Non Profit)	Vicki Al-Dubais, President Vickie.Al-Dubais@txkisd.net	Enrich and support Texarkana College Theatre Department
Region 8 Education Service Center	Dr. Ray Glynn, Executive Director rglynn@reg8.net	Pre-service teacher preparation

Section III: Barriers to STEM Success/TC Involvement in K–12 STEM Education

To keep a finger on the pulse of the vitally important healthcare industry, Texarkana College has recently participated in two sequential studies to identify variables that have led to a nurse and healthcare shortage in Northeast Texas. It was determined that students are not graduating at a rate sufficient to keep pace with the demand for a skilled workforce. Texarkana College has taken steps to identify students most at-risk and help nursing and health occupation students remain in college and overcome barriers that keep them from persisting. Criteria for identification of at-risk students focused on the following variables: reading comprehension, math scores, Anatomy & Physiology grades, family support, and working more than sixteen hours a week.

Texarkana College has implemented a system to identify "at-risk" in-coming nursing students by asking them to complete a survey to determine methods of intervention to assist them with persistence and completion. Intervention methods include counseling that addressing stress, anxiety, time management, family support, critical thinking, test-taking skills, and lecture class participation strategies. Programs also conducted an intensive one-on-one test remediation for students who failed their first test in the Fundamentals of Nursing course by using the Missildine Exam Diagnostic Tool. In addition, through our partnership with Texas A&M University-Texarkana, nursing students have access to expanded counseling services to assist with academic, personal, and financial counseling. As a result of the aggressive outreach measures in place through the Health Occupations department at Texarkana College, the Nursing Program has an above-average passing rate of 96% of students taking the Texas Board of Nursing licensure exam for Associate Degree Nursing (RN) and a 93% passing rate for Vocational Nursing students.

As an Achieving the Dream institution, Texarkana College has made the transition to data driven decision making. Programs across the TC campus are using data to evaluate their services or programs and outcomes. Our data showed that one of the areas that hinder student success is the developmental math sequence. In response, the TC math faculty has created three innovative curriculum concepts based on current best practices to prevent students from losing their math momentum—Modular Math, Integrated Intermediate and College Algebra, and Math Boot Camp.

All of these curriculum changes are designed to move students through the sequence more quickly into college credit bearing coursework and toward completion of a degree, certificate or transfer status. One part of the math initiative involves the widespread implementation of collaborative learning techniques and technology. The math initiative will impact all students enrolling in developmental mathematics courses and college level mathematic courses which equates to approximately 2000 or more students annually.

All three mathematics interventions are designed to improve successful completion rates in the developmental math program. Students placing into the developmental math series are less likely than their counterparts to successfully complete a college credit mathematics course or even to persist in college enrollment due to the length of time it may take to complete the developmental math coursework. The data show achievement gaps tied to the following subgroups: ethnicity (African American), Pell, gender (male), age (18–19). However, this intervention targets the academically underprepared student population (based upon their placement into the developmental math sequence) in its entirety. As a result, the needs of these subgroups will be represented when they fall within the targeted population.

The Mathematics Department and Institutional Research office will assess the effectiveness of these changes through persistence and successful course completion rates for all developmental math courses, College Algebra, and the sequence collectively, disaggregated by standard characteristics, and compare it with baseline data with ongoing treated versus non-treated sections of each course. Also, success rates for Student Learning Outcomes established for each course will be compared in treated versus non-treated sections. In addition, course enrollment rates throughout the implementation process will be tracked for comparison of treated versus non-treated sections. Surveys will be administered each semester in each course to both students and faculty to evaluate the level of satisfaction and engagement in the treated versus non-treated sections. Each semester these data will be shared with key stakeholders to improve the decision making process and ultimately improve and transform student success in mathematics at TC.

Texarkana College contributes to K–12 STEM education in many diverse ways. Three primary contributions are in pre-service teacher preparation, in-service teacher professional development, and sponsorships of student led activities for TC students to collaborate with public schools students and for public school students to compete in cutting edge national events.

TC STEM faculty members are leaders both locally and across the state in pre-service teacher preparation and in-service teacher professional development programs. Key mathematics faculty members from TC have in the past eighteen years served on advisory boards at the state level in establishing guidelines for the mathematical preparation of pre-service elementary, middle and high school teachers and in developing guidelines to improve the STEM preparation of public high school students for college and career readiness.

These math faculty members have received ongoing professional development as statewide trainers for Texas Education Agency approved initiatives in mathematics professional development and incorporated current best practices into the mathematics curriculum at TC, as well as provided professional development in both content development and appropriate pedagogy to in-service teachers across Northeast Texas—actually across the state.

One of our senior math faculty members has twice been selected as a master mathematics trainer for the State of Texas, has collaborated with public school mathematics teachers at all K–12 levels and partnered with the Region 8 Education Service Center to deliver training in best practices in mathematics and science education through the grant funded Texas Regional Collaborative for Science, Mathematics and Technology Excellence. Through this same faculty member, TC has provided grant funded professional development opportunities to area educators in math and science on the application of graphing technology and calculator based laboratories and other hand-held data collection devices. This math faculty member also compiled and co-wrote a high school math curriculum adopted by many school districts across the State of Texas on integrating workforce based agricultural science areas with algebra to improve underperforming student populations' performance on statewide assessments in mathematics.

In addition, Texarkana College partners with the Red River Council of Teachers of Mathematics (a National Council of Teachers of Mathematics bi-state affiliate group) and Texas A&M University-Texarkana to host on our campus Project STEAM (Successfully Training Educators As Mathematicians)—a regional mathematics professional development conference hosted about every three years since 1994 and serving approximately 450–800 regional educators from K–12, two-year and four-year institutions, along with pre-service educators from participating higher education institutions in Texas and Arkansas.

Furthermore, three senior science faculty members have served as Instructional Team Members for the Texas Regional Collaborative for Science, Mathematics, and Technology Excellence for the past twelve years to lead innovation in classroom practices for area public school science educators in biology, chemistry and physics. Two of those science faculty and the previously mentioned mathematics faculty member were awarded a NASA-funded grant, NOVA (NASA Opportunities for Visionary Academics), to transform the higher education curriculum for pre-service teachers at all levels in math and science to incorporate best practices use of technology in the STEM classroom. These faculty members received opportunities to train at NASA facilities in Houston, TX, and at Cape Canaveral, FL, with other leading scientists and educators around the nation on cutting edge applications of technology. This training was implemented in TC STEM classrooms to help pre-service teachers learn to use technology as an avenue to provide a more realistic opportunity to explore math and science concepts in a hands-on, interactive way—thus allowing students to approach these concepts as mathematicians and scientists would approach them. The long-term impact will be realized in public school classrooms across the region as these teachers graduate and implement innovative teaching practices to engage and inspire students in STEM fields.

Two student led activities in the STEM fields at TC involve the Chemistry Club and Earth Club. The TC 3 Club (Chemistry Club), an affiliate of the American Chemical Society (ACS), has been recognized by the ACS as "Outstanding Chapter" for the last thirteen years. Nationwide, approximately only thirty chapters out of seven hundred receive that special designation from the ACS. The TC Chemistry Club appears in the In Chemistry Magazine and the Chemical and Engineering News, and has received the "Green Chapter Award" for the last five years—one of only two two-year colleges that have received these awards in recent history. Due to the award winning efforts of the club and its student participation successes, one of its sponsors was made a "Fellow" in the American Chemical Society.

In Summer, 2011, the TC 3 Club participated in the TC Kids College STEM Week activities though exhibits and demonstrations to area twelve to fourteen year old students. The club provides many service activities including water monitoring of the Sulphur River Basin, tutoring, demonstrations at area high schools and for the public through the mall. The Sulphur River Authority was founded in 1985 by an act of the Texas Legislature. Since 1999, our chemistry club students, Dr. Mike

Buttram and Patti Harmon, Professors of Chemistry, have tested water in the Sulphur River Basin as either a sub-contractor or contractor for the Sulphur River Basin Authority. These contracts are administered through a contract between the College and Sulphur River Basin Authority. This testing monitors any pollution or discharges in the Sulphur River Basin by private, industrial and governmental entities, which includes the Sulphur River, the tributaries to the Sulphur River, both streams and creeks, and Wright Patman Lake. This contract is for a two year period with a positive cash flow implication of roughly $40,000 annually to the College, which is used for work-ships, scholarships, and internships for our Chemistry students and the purchase of both supplies and equipment for the Chemistry Department.

The TC Earth Club receives recognition annually for the Adopt-a-Highway Texas Department of Transportation project and also for the Texas Stream Team water quality monitoring group. In 2010–2011, they were honored for 20 years of service with an all-expenses-paid trip to Houston, Texas, with accommodations at the Hyatt-NASA, and were asked to present their research to all state monitors, representatives from the EPA and the TCEQ. Locally, the Ark-Tex Council of Governments honors the Earth Club's efforts for environmental projects in the area by purchasing equipment each year for water testing and recycling. In addition, they have been recognized annually by the city of Texarkana, TX for volunteer work. Currently nineteen students are participating in waterway clean-up of the Lake Wright Patman shores on National Public Lands Days in coordination with the U.S. Corp of Engineers. In addition, TC has an Environmental Studies Center and wetland area where students are involved in environmental studies about invasive species, water species, bird watching through Project Feederwatch (a Cornell University project done worldwide) and Frogwatch USA/Texas Amphibian Watch.

In other student led activities, Texarkana College sponsored a group of public schools students, the Bionic Bulldogs, in the 2010 FLL Body ForwardT Challenge which explored the cutting-edge world of Biomedical Engineering to discover innovative ways to repair injuries, overcome genetic predispositions, and maximize the body's potential, with the intended purpose of leading happier and healthier lives. The Bionic Bulldogs had call-backs to review their exceptional performances in Teamwork and Project Research in addition to their high Table Performance scores. The TC Bionic Bulldog team was named Qualifying Champion—the highest honor given at the First Lego League Qualifying events. Our team moved forward to the North Texas First Lego League State competition where they competed for the top honors and a chance to attend the World Festival.

Section IV:Percent of TC Students with a Degree in STEM Education

Year	% Graduates with Degree/Certificate in STEM Education	% STEM Graduates-Women	% STEM Graduates – Men	% STEM Graduates – Minorities	% STEM Graduates - Caucasian
2010-2011	51.1%	49.5%	50.5%	26.8%	73.2%
2009-2010	49.8%	52.6%	47.4%	26%	74%
2008-2009	39.8%	46%	54%	23.2%	76.8%
2007-2008	39.5%	51%	49%	20.3%	79.7%

TC provides numerous scholarship opportunities through our Rising Star Scholarship, Presidential Scholarships, Faculty Association Scholarships, and various other endowed scholarships including the Tom Wilbanks Scholarship and the Jake and Bessie Eldridge Scholarship, which allow students to attend their first two years of college primarily cost-free. In the case of the Eldridge Scholarship, outstanding TC students are actually awarded scholarships from TC to continue their education at any Texas public higher education institution. Furthermore, TC partners with many area public high schools to offer dual credit instruction in core curriculum areas including mathematics. Many STEM students pursue both scholarship and dual credit opportunities to advance their educational goals through Texarkana College.

Section V:TC Awareness/Use of Federal Grants

NOVA Grant: In 2000, Texarkana College, through the Division of Physical Science and Mathematics, was awarded the NOVA Grant. Through efforts made by faculty, collaboration with NASA enabled students from local Independent School Districts to benefit from state-of-the-art, technology-based instruction. This grant continued

for five years and the results have been a lasting impact on techniques used both at the K–12 level and continuing on to higher education in our area. http://old.texarkanacollege.edu/mstorey/NOVA/tgazette22300.htm.

U.S. Department of Education:

Direct Programs Include–

- Student Financial Assistance/Federal Supplemental Educational Opportunity Grants
- Federal Work-Study Program
- TRIO– Student Support Services
- TRIO– Talent Search
- Federal Pell Grant Program
- Academic Competiveness Grant

Passed-Through Texas Higher Education Coordinating Board Grants–

- Vocational Education– Basic Grant
- LEAP
- SLEAP
- Byrd Scholarship

U.S. Department of Health and Human Services: Passed-through North East Texas Workforce Solutions:

- Summer Youth Employment – WIA Youth Program
- Child Care Mandatory and Matching Funds

Section VI:TC Transfer & Employment Information

Texarkana College has a 24% transfer rate for FY 2010 to higher education institutions within the State of Texas; however, we have been unable to track transfer rates to higher education institutions in other states which is presumably high for TC due to our border state status. We are joining the National Student Clearinghouse in 2011–2012 to improve a variety of student transfer services including tracking of our total transfer rate. Almost 83% of our total academic students are employed after graduation and/or go on to pursue a four-year degree. Graduates of our workforce education programs have a slightly higher rate with almost 85% employed and/or enrolled.

Within our community, Texas A&M–Texarkana has been our collaborative partner to provide a seamless transition for students to pursue a four-year bachelor's degree. In 2010, more than 80% of their enrolled students were considered transfer students (TX College Almanac, 2010) of whom we were the primary source.

Articulation agreements are in place with the following institutions of higher education:

- Southern Arkansas University
- Texas A&M University – Texarkana
- University of Texas – Tyler

Chairman HALL. And thank you, thank you very much. To accentuate that day on the moon, just last Thursday, we had Neil Armstrong, the first man on the moon, and Gene Cernan, who was the last American on the moon, before our Committee. And they spent the entire day with us and with our staff and with youngsters, encouraging them. They are great, great people. I even found out why Neil Armstrong was the first on the moon. Buzz Aldrin started to go out, and Neil caught him by the arm and said, "Wait just a minute, I'm supposed to go out first." Buzz said, "No, I out rank you. I'm a captain in the Navy." He said, "No, you don't out rank me. I'm a citizen." And he stepped out first, and that was very interesting. And he gave the time. Kate Kronmiller gets the credit for getting astronauts for us here because I'd always go to her. She was on the USA Committee, and she was one, with her boss, who would count down, ten, nine, eight, seven, six, and save lives of people by stopping them if they weren't ready to go.

By the way, I've had my eyes done— redone cataracts. Her husband had them done at the same time. I had my one at a time because I had a bill on the floor and I had to have a good eye to do

that. She had both of his done at the same time, not because it saved time, because Kate likes a party. Anything that can cause you to have a party, and she wanted to have a opening up party for him, opening those blinds off his eyes. They did that with four or five astronauts, several of us there with her. Everybody shaking a glass with ice in it. And ta-da, and they opened them and pulled it off. And he opened and he looked at Kate. He said, "My God, Kate, you've aged." That ended the ceremony right there.

All right. Now, I recognize Dr. Brad Johnson for five minutes to present his testimony.

Thank you, sir. Thank you, Brad.

STATEMENT OF DR. BRADLEY W. JOHNSON, PRESIDENT, NORTHEAST TEXAS COMMUNITY COLLEGE

Dr. JOHNSON. Thank you, Chairman Hall, Congresswoman Johnson. I appreciate the chance to present this testimony.

Let me tell you just a bit about the college that I serve. Northeast Texas Community College is a small comprehensive community college located on 400 acres of farmland about 6 miles outside of Mount Pleasant, Texas. NTCC has grown by almost 50 percent in the last three years, to more than 3400 credit students. Northeast Texas serves a student body that is diverse in every imaginable way. We are diverse racially and ethnically. We are diverse in terms of the family educational backgrounds from which our students come. And we are diverse in the educational preparation with which those students arrive.

There are three aspects to the community college's workforce role that NTCC tries to focus on.

The first is to bring the literacy levels of aspiring college students up to college level. The second is to provide whatever general education is needed for their particular educational goals. And third, to complete the education of students entering terminal degree areas.

Northeast Texas contributes to the nation's STEM fields in several critical ways. First, as has already been mentioned, we are most likely the gateway through which first generation and economically disadvantaged students begin their college careers. We also train the technicians required to work within fields which applies STEM knowledge to American business. The college, in partnership with Texas A&M Texarkana, provides the ability for some of our students to become teachers while they remain on the NTCC campus, a benefit that I have heard from several of the area superintendents has made the difference in their ability to continue to provide a quality education to our area. Our most recent example of successful collaboration is happening right now. Three partners came together this year to open a regional training academy in Mount Pleasant. This project merges with career and technical training provided by Mount Pleasant Independent School District with the workforce training provided by Northeast Texas Community College in two areas, electrical trades and industrial technology. The result is a state of the art program that serves both high school and adult students in the same facilities with the same instructors and using the same equipment. By fall 2012, all 11 of

the ISDs in our service area will be able to participate in this academy.

The biggest challenges for Northeast Texas Community College in terms of STEM education line three areas, student preparation, student interest and college resources. In terms of preparation, 39 percent of our students must take one or more developmental math courses on their arrival at the college, and only 33 percent of our students require no remediation at all.

In terms of interest, too few students choose a STEM major, and when we ask them why, they cite the rigger of the science and math courses or a lack of interest, and I think actually a lack of awareness of the careers that they believe follow such degree choices.

In terms of resources, the shrinking college resources that we have been experiencing in the last two or three years create a bottleneck within our lab sciences at Northeast Texas. This fall, our lab science courses were filled well before the term began, leaving lists of students waiting and hoping for slots vacated by withdrawals.

Our transfer challenge is also interesting in several ways, but one of them that is somewhat unique to being a rural college is the geographic challenge. There are no universities less than an hour's drive from NTCC. To mitigate that obstacle, NTCC partners hosted a university center on our campus. This center has full-time staff and faculty from Texas A&M University Texarkana, who assist with the transfer process, as well as providing the courses on our campus necessary to complete Baccalaureate degrees in education and business.

I want to thank you for the opportunity to provide this testimony and would welcome any questions that you might have further.

[The prepared statement of Dr. Johnson follows:]

PREPARED STATEMENT OF DR. BRADLEY W. JOHNSON, PRESIDENT, NORTHEAST TEXAS COMMUNITY COLLEGE

My name is Bradley W. Johnson, President of Northeast Texas Community College, here to provide testimony on the contributions of my college to the economy, workforce and community.

Northeast Texas Community College (NTCC) is a small, comprehensive community college located on 400 acres of farmland six miles outside Mount Pleasant, Texas. NTCC has grown by almost 50% in the last three years, to more than 3,400 credit students (35% male; 65% female) this fall. Half the students are preparing to transfer to a university and pursue a baccalaureate degree, while a quarter are preparing for a career in healthcare. The last quarter is preparing for immediate entry to other areas of the workforce, such as automotive technology and culinary arts, law enforcement, computer information technicians, welding and electrical occupations.

Half of the students at NTCC receive a PELL grant and almost 70% receive some kind of financial aid to attend college. The cost to a full time student for tuition and fees is under $1000 (in district) per semester. However, tuition covers less than 20% of the total cost to operate the college. The remaining revenue needs are covered with a local ad valorum tax (currently capped at 10 cents/$100 valuation), state formula funding and other sources.

Northeast Texas Community College serves a student body which is diverse in every imaginable way. Almost a quarter of the students are Hispanic and another 14% are African American. More than 16% of the students come from homes where neither parent graduated from high school and only 20% of the students have a parent who completed a baccalaureate degree. On the other hand, the college serves a number of the top graduates of the region, annually admitting valedictorians/salutatorians and other top performers to its *Presidents Scholar's* program. These and

other students regularly participate in regional and national undergraduate research contests and earn distinction in head-to-head competition with public universities from across a five-state region.

The Workforce Development Role of Northeast Texas Community College

Northeast Texas Community College's role is to provide entry-level training and education to persons who are either initially entering the workforce or who are seeking to reenter and retrain in new areas or with updated skills. The college does that through its credit offerings (traditional degrees and certificates), as well as through customized and standardized non-credit offerings.

There are three aspects to the college's workforce development role; 1) bring the literacy levels of aspiring students up to college-level, 2) provide whatever general education is needed for their particular educational goals, and 3) complete the education of students entering terminal degree areas. By meeting this mission, the college improves the marketability of job seekers, productivity of workers, and quality of life for both workers and their families, while reducing the demand on governmental services by those same people.

In a 2010 study of NTCC's role in the regional economy, several measures quantified aspects of the college's economic impact on the eight-county region surrounding Mt. Pleasant, Texas.

1. The Texas tax base expands by about $16.5 million annually as a result of the increased earnings and productivity of NTCC students;
2. State and local governments receive an 8.5% ROI (rate of return) on the direct support they contribute to the college operation;
3. Students receive an 18.9% ROI on their investment in the college (tuition, fees, forgone wages), meaning they earn back 100% of their investment within 7.8 years;
4. The state will avoid $823,800 per year in avoided social costs due to the education of NTCC students. Savings come from improved health, reduced crime, and reduced welfare and unemployment.

These impacts compounded across the nation through the work of thousands of sister institutions; make community colleges a critical player in the U.S. economy.

Northeast Texas Community College contributes to the nation's STEM (Science, Technology, Engineering and Math) fields in several critical ways. First, we are the most likely gateway through which first-generation and economically-disadvantaged students begin their college careers. Although only 10% of our total student body are seeking a STEM degree, these are still significant contributions to the effort.

We also train the technicians required to work within the fields which apply STEM knowledge to American business. Lab technicians, nurses and other medical technicians, industrial technicians, and numerous others are necessary if the innovations arising from science research and development efforts are ever to reach the market they are intended to serve. NTCC has seven health-related programs (844 students) and more than a dozen workforce-related programs (more than 200 students) which provide critical technician-level training to the region and nation. Programs like computer networking and programming provide indispensible support to STEM operations in the educational, research & development, and business arenas.

The college, in partnership with Texas A&M–Texarkana, provides the ability for students to become teachers on the NTCC campus. The Superintendent at one area school district (Mt Vernon ISD) recently reported that, without the teacher education program at NTCC, his school likely would not be able to find teachers. Supplying, and strengthening, the pool of educators is important to STEM efforts, as well.There has been much discussion among those of us in rural areas about the severe "brain-drain" caused when we educate our best and brightest students through high school, then send them off to the big city for an undergraduate education and never get them back (until perhaps they retire). One of our major area employers, a public utility with a power plant in our region, has noted recently that they strongly prefer employees who grow up in East Texas. According to their personnel director, "we've tried importing skilled workers—they don't stay. We want those who have family and roots here so our workforce investment will return a healthy profit."

Today this company is our partner in a local industrial technology training program because they have learned their best employees are those with roots in the region, who want to stay in the area and who therefore have a long-term view of supporting the company's success. NTCC educates students who are far more likely to remain in the region than those who leave for their undergraduate studies.

Collaborations to Create and Maintain an Educated & Skilled Workforce

Northeast Texas Community College partners with every part of our region to accomplish our mission at a fraction of the cost of the private sector, for-profit colleges. Programs like "College Connection" put our students and staff in the high schools, junior highs, and elementary schools of all 11 districts in our region. College Connection assures that every graduating high school student is admitted to the college, or has a post-secondary plan, before they walk across the stage.

The college, through the Communities in Schools program, has staff in most school districts providing case management, social services, and educational interventions to at-risk students. These school districts contribute their own funds, making this program a valuable grassroots collaboration.In 2010, a regional collaboration called the "Regional Advanced Manufacturing Academy" received state and national awards for its innovations which brought industry-driven training to new and incumbent workers across the entire Northeast Texas region. This collaboration between three community colleges, the regional workforce board, and the Texas Workforce Commission, was managed by NTCC and exceeded all performance standards while earning strong reviews by the companies served.

Despite the 2008 economic downturn, which has been particularly brutal for our region because of our heavy dependence on manufacturing, three partners came together this year to open the Regional Training Academy. This project merges the career and technical training provided by Mount Pleasant Independent School District with the workforce training provided by Northeast Texas Community College in two areas: electrical trades and industrial technology. The result is a state-of-the-art program that serves both high school and adult students in the same facility, with the same instructors, and using the same equipment. By Fall, 2012 all other ISDs in the area will be able to participate in the Academy.

Area industries have identified such a critical labor shortage in these areas that the project (Regional Training Academy) opened its doors in March, six months before the facility was finished. Training occurred in the evening while construction took place during the day. The Industrial Technology program has two cohorts of students in training now, and roughly 50 high school students will join the project this month. Immediate expansion plans include an AutoCAD program, and long-term discussions have begun on the possibility of an engineering technology program with a university partner. All this was accomplished for the cost of $1.5M and in a span of one year. Significant financial and political support came from the Mount Pleasant/Titus County Industrial Development Corporation. This project demonstrates the power of community-based decision making and collaboration.

Challenges to NTCC Students in STEM Subjects

The biggest challenges to Northeast Texas Community College in terms of STEM education lie in three areas: student preparation, student interest, and college resources.Despite major efforts on the part of our public education system to raise standards and improve student performance in math and science, too many of our students arrive with deficits in their academic preparation. Thirty-nine (39) percent of our students must take one or more developmental math courses and only 33% of students require no remediation at all.

Too few students choose a STEM major, citing the rigor of the science and math courses or lack of interest in the careers they believe follow such degree choices. Even though one in ten students are following a STEM major, the largest numbers of those students (4% of total student body) are preparing for the healthcare field, leaving too few students pursuing the pure sciences or engineering.

Shrinking college resources create a bottleneck in the lab sciences at Northeast Texas Community College. This fall our lab science courses were filled well before the term began, leaving lists of students hoping to fill slots vacated by withdrawals. The college simply did not have either the faculty or lab classrooms available to open more sections. Lab sciences were offered morning, afternoon and evening until every qualified instructor was teaching, and still we could not meet demand.

With more than $2 million in facility deferred maintenance, the college has no funds to build more classrooms or hire additional science faculty. We replaced one science instructor this past summer but could not afford additional faculty. The college has had to close its Radiologic Sciences program in order to absorb the state funding cuts.

STEM Education at Northeast Texas Community College

Only 2.4% (or 12 students) of the 2010 graduating class at NTCC received STEM degrees. Three-quarters of these were male and two-thirds were minority students. The college is aware of its challenges with graduation and transfer of its students. Graduation rates are better than average for community colleges, far too many stu-

dents are falling by the wayside. NTCC has recently begun a major rethinking of our entire operation with the focused intention to achieve dramatic future improvements in student success.

Northeast Texas Community College has made considerable efforts in the past to provide opportunities for students interested in STEM career paths. Most recently, for example, our students participated in some of the best STEM experiences in the country:

- Josh Galloway and Alex Best were chosen to participate in the REU (Research Experience for Undergraduates) program at TAMU–Commerce;
- Alex Villalobos participated in Baylor College of Medicine's Summer Undergraduate Research Fellowship Program in Houston, Texas;
- Maria Chavez participated in Boston University's Summer Undergraduate Research Fellowship Program in Boston, Massachusetts;
- Clara Ramirez participated in the Dialysis Clinic, Inc. Collegiate Medical Summer Internship Program in Nashville, Tennessee;
- Alex Villalobos participated as a Research Intern in the Johns Hopkins Asthma and Allergy Center Summer Research Program in Baltimore, Maryland.

This college was the first community college to be approved by Texas A&M University—College Station Biomedical Sciences program for guaranteed admission of our graduates. Students completing their first two years' studies, following prescribed curriculum, and maintaining superior achievement are guaranteed transfer into this university program. A number of students have graduated successfully from Texas A&M under this preferred admission arrangement.

NTCC's most recent National Science Foundation grant program sought to improve educational outcomes for STEM students and was entitled, *"Mathematics Access for Promising Scholars (MAPS) Project."* MAPS was founded to increase the number of minority and underrepresented students with low income who have high ability and the desire to major in a mathematics intensive course of study. The following activities were incorporated to accomplish this goal:

1. Advertisement of the scholarship by instructors and posters,
2. Organization of a campus math/science student organization,
3. Creation of a cohort of students planning to earn an A.S. (Associate in Science degree) in a math intensive course of study,
4. Establishment of direct communication by faculty with selected transfer universities.

Within the MAPS project, the NTCC math and science faculty recruit, mentor, and assemble a cohort of students. Working with their colleagues in the mathematical sciences department of Texas A&M University-Texarkana and Texas A&M University-Commerce our faculty remove barriers for students to transfer to each of these institutions respectively. In particular, an articulation agreement was established in 2008 in Industrial Engineering with Texas A&M University-Commerce. To help students with the transfer process, the NTCC calculus sequence was modified and improved in 2007 to parallel the universities in Texas.

Creating a cohort of students in the mathematical sciences that is closely mentored by dedicated faculty mentors continues to be the most beneficial activity for students majoring in the math-intensive disciplines. The close friendships and support among students prove to be the major reason that students elect to continue the more challenging courses. In addition, academic advisors share information that is important to help students understand the difficulty of the mathematical sciences and the time required to earn a degree in a math-intensive area. Most NTCC students do not understand —nor do their families understand—the difficulty caused by working excessive hours to help pay for college expenses while enrolled in classes in the hard sciences.

MAPS Outcomes since 2002:

- A total of 95 students were awarded the MAPS scholarship;
- Approximately 45% of these recipients were minority students;
- Overall, 74% of the scholarship recipients completed the calculus sequence or were on-track to complete the sequence within a semester;
- 98% of the recipients have credit for Calculus I or above;
- One in three scholarship recipients have earned a B.S. in mathematics or were pursuing the degree at the end of the program;
- Two-thirds (65%) have earned or were on-track to receive an A.S. or above in STEM;
- The overwhelming majority (91%) of the recipients have either graduated with an associate degree or matriculated to a university. NTCC graduation rates overall ranged from 20% to 30% during the time of this program.

Use of Federal Resources by Northeast Texas Community College

Although we have sought a number of National Science Foundation grants in the past, we have been mostly unsuccessful. We understand our challenges to be 1) a lack of experience writing NSF grants which can be highly technical in nature, and 2) a historic preference at the agency for funding research institutions.

We have been more successful working as sub-recipients on grants written by our partner universities. While this has earned our students scholarships and some enhanced learning activities in the past, it is difficult to secure grant funds for labs and equipment when we are a sub-recipient.

One successful effort has focused on STEM recruitment. It was funded through a combination of grants from the Texas Education Agency (TEA) and the U.S. Department of Education. The goal was to inspire interest in Science, Math and Technology among the children of our service district. NTCC implemented SMART (Science, Math And Related Technologies) Girls, The Science Road Show and Summer Science Academy were implemented in February, and conducted throughout the remainder of the school year.

These projects were conducted in the schools of Mount Pleasant Independent School District, Pittsburg Independent School District, Daingerfield-Lone Star Independent School District, Paul Pewitt Consolidated Independent School District, Harts Bluff Independent School District, Chapel Hill Independent School District, and Winfield Independent School District. The SMART Girls Conference was held on the Northeast Texas Community College campus. Since the inception of these programs, NTCC has expanded outreach to include hands-on activities targeting boys in middle school, to pique their interest in science, math, technology and pre-engineering with WISE Guys (Working In Science and Engineering).

WISE Guys has brought boys to the campus of Northeast Texas Community College campus for week-long academies in the summer to learn about robotics, alternative energy sources, sustainable agriculture and much more. To help meet the growing interest among students, NTCC also implemented SciFi2 (Science Fun, Instruction and Interaction), workshops for teachers in grades 4 through 6 to help them develop new strategies for presenting science instruction to students. These workshops were sponsored in part by the American Chemical Society (ACS) and offered exciting and engaging activities using low-cost items that teachers could incorporate into their existing curriculum. Other activities, such as Engineering Your Future have brought hundreds of students to the campus of NTCC to learn about careers in science, mathematics, engineering and technology, featuring speakers such as NASA engineer Thomas Morrow.

Other examples of NTCC's outreach in the areas of science, math, engineering and technology include offering high school students the opportunity to explore careers in those areas. To do this the college has created opportunities for students to dialogue with professionals from careers in science and engineering, including a NASA Astronaut.

Since 2004, almost 2,000 girls in grades 5–8 have attended a SMART Girls Conference and over 4,000 girls have participated in some kind of SMART Girls activities throughout the year, with the following demographic breakdown:

- Hispanic 43%
- Asian 36%
- African American 20%

Over 14,000 students have participated in Science Road Show Activities. These students had the following demographic makeup:

- Females 52.1% / Males 47.9%
- Hispanic 29.63%
- Asian 0.8%
- African American 17.68%

So far, over 200 girls have participated in Summer Science Academy activities and 115 boys have participated in WISE Guys Academy activities. SciFi2 has brought 60 teachers from NTCC service area schools to the campus of NTCC for a two day workshop coordinated by NTCC faculty in science and engineering.

Preparing Students to Transfer or Enter Workforce

To enhance the capabilities of our students for success after they leave Northeast Texas Community College, we seek to match or exceed the rigor offered at universities in core curriculum courses, while providing the advantages which come with a small campus—personal relationships with our students which allow for more effective instruction.

There are no universities less than an hour's drive from NTCC. To mitigate that obstacle, NTCC partners to host a University Center on the campus. This Center has full time staff and faculty from Texas A&M University—Texarkana who assist with the transfer process as well as provide the courses on the NTCC campus necessary to complete baccalaureate degrees in Education and Business.

Our advisors regularly work with their university-counterparts so advising can be as accurate as possible and students can complete as many courses at NTCC as will count toward their baccalaureate degrees before they leave us.

Student preparation for the workplace is enhanced because we have personal experience with our major area employers, having toured their facilities and often provided workforce training in partnership with those employers. This assists faculty in bringing the curriculum to students which fits the needs of our regional employers. These local adjustments are most clearly seen in decisions like which versions of software we will teach, the integration of LEAN manufacturing methods into business classes, and the decision to add Level II training to the Industrial Technology program a year sooner than planned.

Thank you for the opportunity to provide testimony to this Committee. The challenge to prepare high quality college graduates in sufficient numbers to return the United States to its leadership role on the world economic stage is great and will take all of us working together to be successful.

Chairman HALL. Thank you very much.

And at this time, I recognize our final witness for this panel, Dr. Rathburn, for five minutes, Mr. President.

STATEMENT OF DR. C.B. RATHBURN, PRESIDENT, TEXAS A&M UNIVERSITY – TEXARKANA

Dr. RATHBURN. Thank you, Chairman Hall and Representative Johnson for being here with us this morning. Welcome to Texarkana, Texas, the home of integrated STEM education.

My name is C.B. Rathburn. I'm honored to serve as President of Texas A&M University Texarkana, but prior to this, I spent 27 years of my career at a community college, including 13 years as a community college president in two states.

The emphasis and focus on community college education here today, especially on the topic STEM education, is not only timely but incredibly important. I appreciate the opportunity to participate this morning and discuss lessons learned from a seven-year partnership in a pre-kindergarten through Baccalaureate degree integrated STEM education, as well to address your questions regarding the development and operations of STEM education programs leading to enhanced workforce development and economic development. Your subject is, in fact, critical to the future our nation's economy. The tide of losing high paying science, technology and engineering jobs to other countries is alarming but understandable when you consider the declines experienced over the last two decades in the performance of our students in math and science curricula and the production of both STEM field graduates and qualified STEM educators. The decline has been especially challenging in our smaller and more rural communities across our nation.

While America has experienced significant declines over the last decade in STEM education performance and resulting economic developments, other nations, among them China, North and South Korea, and India, are enjoying significant improvements in both postsecondary attainment in STEM fields and overall STEM education performance. This does not bode well for our nation long-term.

For the United States to regain and expand our competitive edge in the global economy, this trend must be reversed. Unfortunately, there are no quick fixes to this challenge. Most recent studies in STEM education performance conclude that an integrated emphasis on critical math, science and engineering concepts must begin at the early childhood education level and continue each and every year through high school for students to be adequately prepared for success in postsecondary STEM education. To accomplish this, we must refocus our primary and secondary education resources and curricula structures to enhance core math, science and analytical thinking skills before we will see a significant improvement in STEM postsecondary attainment.

The United States continues to face a critical shortage of well prepared STEM educators at all levels, as well as the resources to support essential continued professional education to STEM teachers currently in the field. This shortage is especially acute in rural communities where the need for STEM education and the resulting economic renewal through a well educated workforce is most needed. A&M Texarkana is proud of the easily replicable partnership created and tested with the Texarkana Independent School District, which has demonstrated great promise in reversing the declining tide in both STEM education performance of our students, as well as significant improvement in STEM teacher preparation. We look toward the opportunity in our written testimony to describe further how this can be enhanced.

In response to the questions proposed by Chairman Hall, I am pleased to provide the following responses. A&M Texarkana is a comprehensive regional university serving the educational needs of East Texas, and our diverse four-state region. We are an institution of access and a proud member of the Texas A&M University system with over 130,000 students served daily through 11 member universities and 7 state agencies. For the first 38 years of our existence, A&M Texarkana served as an upper division and Master's degree rating university, but thanks to visionary local leadership, strong legislative support, the university transformed over the last two years into a comprehensive regional Doctoral level university. The fall of 2011 freshmen class, our first freshmen class in the fall of 2010, grew by almost 300 percent, making us one of the fastest growing universities, not just in Texas, but in the Southwest.

A&M Texarkana has a distinguished history in the preparation of professionals in all fields with a particular focus on quality teacher preparation. With the establishment of the first STEM college in the state of Texas in January of 2010, our emphasis on the production of STEM graduates has expanded exponentially in the last two years. Our programs in computer science, electrical engineering, biology, mathematics, and nursing boast world class faculty and are growing at a tremendous rate. For the last two years, a majority—I'll state it again—the last two years, a majority of our incoming freshman have chosen for fields in the STEM college, which we're very proud of. Presently, the STEM college is searching for faculty to start a new program in environmental engineering in partnership with the program at Northeast Texas Community College. We have great natural resources in water and land

in East Texas, and we want to take advantage of those, not only for education, but for economic development purposes.

A&M Texarkana has received accolades for the success of our undergraduates in STEM education, placing first and third in the last two years in statewide undergraduate research competitions. That was in direct competition with universities such as A&M College Station.

You talk about partnerships, the Hedgehog, if you're a student of Collins, Good to Great, for our university is to be world class at partnerships. Our collaborative efforts for the creation of Martha & Josh Morriss Mathematics & Engineering Elementary School in recent years, coupled with the extension of this PK–16 STEM partnership through the middle and high school, has produced great student success as well as national acclaim. The Westlawn Professional Development School, in partnership with TISD, is a new model for teaching preparation, which we must take a hard look at, and has proven its worth over the last eight years. Our electrical engineering and computer science programs grew directly out of the collaboration with local business and industry and were funded with the private sector investment of over nine million dollars, including support of our own H. Ross Perot here in Texarkana. Students in these STEM fields are engaged in internships with organizations such as Cooper Tire and other local employers.

Our newest STEM initiative is in environmental engineering program, as I mentioned. It's a collaboration between TexAmericas Center, the City of Texarkana, Texas, and Northeast Texas Community College. We have nearly 100 million dollars in remediation work that needs to be done environmentally at the TexAmericas Center, which the opportunity for workforce development and the opportunity for research in that area is incredible. We recently received a $300,000 Brownfield EPA grant to begin workforce development critical for this.

By far, of course, our largest collaboration partnership is workforce development with our regional community college partners in Texas, Oklahoma, Arkansas, and Louisiana. We are a strong supporter of the "2+2" model of higher education and have recently initiated an expanded effort with all of our area community colleges to enhance the vertical articulation, joint student advisement and seamless transfer of our students. We are convinced that this is a premier model for efficient, cost effective production of a skilled workforce at the Baccalaureate level and that this partnership produces the best option for many of our students. We are proud to have the lowest tuition rate in the state of Texas, and we think this provides access for our students.

The major challenge impacting the performance and success of our students in postsecondary STEM fields is clearly the core science and math skills of the entering students coupled with what I like to call the "Google" effect. With fewer students mastering higher level math and science skills up through calculus, as demonstrated by falling math and science quantitative measures, we see the growing and growing challenge of unsuccessful remediation at the postsecondary level. Our students are simply not prepared for success in the STEM fields, especially in fields like engineering and physics. In addition, too many students entering lack the ana-

lytical and critical thinking skills essential to the success in STEM education. Far too many students are content with a simple Google search to find the answer to a question rather than scientific discipline to seek the answers through creative inquiry. This leads to the inability of today's students to conceptualize higher order STEM concepts and develop the analytical thinking skills.

Clearly, STEM education is in the forefront in the Texarkana community. Clearly, STEM education in this community is a result of enhanced partnerships. And clearly, it is the future for the Texarkana region. Thank you for the opportunity to participate this morning.

[The prepared statement of Mr. Rathburn follows:]

PREPARED STATEMENT OF DR. C. B. RATHBURN, III, TEXAS A&M UNIVERSITY–TEXARKANA

Honorable Chairman Ralph M. Hall and Members of the U.S House of Representatives Committee on Science, Space and Technology, welcome to Texarkana, Texas and to the home of integrated STEM education in Texas. My name is C. B. Rathburn and I am honored to serve as the President of Texas A&M University-Texarkana. Thank you for inviting me to participate in this important hearing this morning to discuss lessons learned from a seven year partnership in Pre-Kindergarten through Baccalaureate Degree integrated STEM education and to address your questions regarding the development and operation of STEM education programs leading to the development of an enhanced workforce, economic development and job creation for our local communities. I am pleased and honored to have the opportunity to provide testimony to your Committee today and to welcome you, Mr. Chairman, home to East Texas.

Your subject is critical to the future of our nation's economy. The tide of loosing high paying science, technology and engineering jobs to other countries is alarming but understandable when you consider the declines experienced over the last two decades in the performance of our students in math and science curricula and the production of both STEM field graduates and qualified STEM educators. This decline has been especially challenging in our smaller and more rural communities across our nation.

While America has experienced significant declines over the last decade in STEM education performance and resulting economic development as detailed in a variety of reports including the Educational Testing Services pivotal work, "America's Perfect Storm," other nations including China, North and South Korea and India are enjoying significant improvements in both postsecondary attainment in STEM fields and overall STEM education performance of their students. For the United States to regain and expand our competitive edge in the global economy, this trend must be reversed. Unfortunately, no quick fixes to this challenge exist.

Most recent studies on STEM education performance conclude that an integrated emphasis on critical math, science and engineering concepts must begin at the early childhood education level and continue every year through high school for students to be adequately prepared for success in postsecondary STEM education. To accomplish this we must refocus our primary and secondary education resources and curricular structures to enhance core math, science and analytical thinking skills before we will see significant improvement in STEM postsecondary attainment.

The United States continues to face a critical shortage of well prepared STEM educators at all levels as well as the resources to support essential continuing professional development for STEM teachers currently in the field. This shortage is especially acute in rural communities where the need for STEM education and the resulting economic renewal through a well educated workforce is most needed. Texas A&M University-Texarkana is proud of the easily replicable partnerships created and tested with the Texarkana Independent School District, which have demonstrated great promise in reversing the declining tide in both STEM education performance at the PK–12 level and a significant improvement in STEM teacher preparation. We have developed a plan for the creation of a Regional STEM Research and Education Center as a collaborative with a number of school districts and partner universities across our four-state region designed to:

- Enhance the recruitment and production of STEM educators at all levels,

- Expand continuing professional development opportunities for current STEM educators designed to improve student performance in critical knowledge and skills areas and enhance the retention of current STEM educators and
- Develop a digital demonstration laboratory library to support current STEM educators in the field with special emphasis on the needs of STEM educators in rural and small school districts

We would welcome the opportunity to further develop and test these concepts and process as a model for use in communities across the nation.

In response to the questions proposed by Chairman Hall, I am pleased to provide the following responses and comments.

Texas A&M University-Texarkana is a comprehensive regional university serving the educational needs of East Texas and our diverse four state region. We are an institution of access and a proud member of The Texas A&M University System serving over 130,000 students annually through 11 member universities and seven state agencies across Texas. For the first 38 years of our existence, A&M–Texarkana served as an upper division and master's degree granting university but thanks to visionary local leadership and strong legislative support, the University transformed into a comprehensive regional doctoral level university over the last 24 months accepting our first freshman class and first doctoral students in the fall of 2010. The fall 2011 freshman class grew by nearly 300% compared to the fall 2010 class making us one of the fastest growing universities in the southwest.

A&M–Texarkana has a distinguished history in the preparation of professionals in all fields with a particular focus on quality teacher preparation. With the establishment of the STEM College at A&M–Texarkana in January 2010, our emphasis on the production of STEM graduates has expanded exponentially in the last two years. Our programs in computer science, electrical engineering, biology, mathematics and nursing boast world class faculty and are growing at a tremendous rate. For the last two years a majority of our incoming freshman chose majors within the STEM College over programs in the other two colleges within the University. Presently the STEM College is searching for faculty to start a new program in environmental engineering and water and land management to take advantage of these great East Texas natural resources and the resulting potential economic development.

Texas A&M University-Texarkana has received accolades for the success of our undergraduate STEM students placing first and third in the past two years in statewide undergraduate research competitions in direct competition with universities such as Texas A&M–College Station. The STEM College has received funding from the National Science Foundation and the EPA in the last two years to support these research and workforce development programs.

The "Hedgehog" for the university, if you are a student of Collins work Good to Great, is to be world class at partnerships. Our collaborative efforts in the creation of the Martha and Josh Morris Mathematics and Engineering Elementary School in recent years, coupled with the extension of this PK–16 STEM partnership through the middle and high school, has produced great student success and national acclaim. The Westlawn Professional Development School, in partnership with TISD as a new model of teacher preparation, has proven its worth over the last eight years. Our electrical engineering and computer science programs grew directly out of collaboration with local business and industry and were funded with the private sector investment of over $9 million. Students in these STEM fields are engaged in internships with organizations such as Cooper Tire and other local employers.

Our newest STEM initiative in environmental engineering is a direct result of a collaborative effort between the TEX–Americas Center, the City of Texarkana, TX and Northeast Texas Community College. The nearly $100 million environmental reclamation of the former Lone Star Army Ammunition Plant served and a catalyst for this initiative to develop critical education and workforce development programs for the emerging field of environmental remediation and environmental engineering. The University, in cooperation with the city of Texarkana and Tex-Americas Center, recently received an initial $300,000 EPA Brownfield training grant in preparation for this effort. This effort is projected to grow significantly in future years.

By far our largest collaborative partnerships in workforce development are with our regional community college partners in Texas, Oklahoma, Arkansas and Louisiana. We are committed to the "2+2" model of higher education and have recently initiated an expanded effort with all of our area community college partners to enhance the vertical articulation, joint student advisement and seamless transfer of students. We are convinced that this is the premier model for efficient, cost effective production of a skilled workforce at the baccalaureate level and that this partnership produces the best option for many students. With Texas A&M–Texarkana's

lowest tuition and cost of attendance in Texas and the entire region, this also produces the best value for degree attainment for the student.

The major challenge impacting the performance and success of students in postsecondary STEM fields is clearly the core science and math skills of the entering students coupled with a "Google" mindset. With fewer students mastering higher level math and science skills up through calculus, as demonstrated by falling math and quantitative measures on standardized tests such as the ACT or SAT and the growing challenge of unsuccessful remediation of basic skills at the postsecondary level, many students are simply not prepared for success in collegiate STEM courses especially in engineering and physics. In addition too many entering students lack the analytical and critical thinking skills essential to success in courses requiring creative inquiry and the application of the scientific method. Far too many students are content with a simple "Google" search to find the answer to a question rather than the scientific discipline to seek the answers through creative inquiry processes. This leads to the inability of today's student to conceptualize higher order STEM concepts and develop the analytical thinking skills necessary for success in these fields. These academic challenges along with the pressing financial burden of the cost of higher education often leads to students either dropping out totally or finding an easier course of study outside the STEM fields. In either way we are losing the production if critical graduates for the STEM fields.

The answer to this challenge is clearly demonstrated in the PK–16 STEM partnership operational in Texarkana today. Beginning with the Morris Math and Engineering Elementary School through the Texas Middle School STEM Academy, on into the Perot STEM Academy at Texas High School and directly into the STEM programs at Texas A&M University-Texarkana, students in our community are provided the opportunity beginning at the Kindergarten level to develop both a solid STEM background and the inquiry skills to be successful at the postsecondary level. A&M–Texarkana was involved at all levels of the development of this partnership from the design of the curriculum, to the design of the facilities, to the creation of a unique masters program to equip the public school teachers with the critical knowledge and skills to be successful in teaching the STEM concepts. The success of this partnership is documented in the students progressing through this system today and will be demonstrated over the next six years as successful graduates from the University.

With the creation of the STEM College at Texas A&M–Texarkana in January 2010 the number of students majoring in STEM programs has grown by 100% and the number of STEM graduates by over 50%. In 2011, approximately 10% of A&M–Texarkana's graduates were in STEM fields. Females represent approximately 66% of these graduates with minority representation at approximately 20%. Both these numbers are reflective of the overall percentages for all students in all programs at the university.

As previously stated the growth in the STEM College enrollments over the last two year at A&M–Texarkana has been exceptional. A majority of new freshman entering the university in each of the last two fall semesters have chosen degree programs in the STEM fields. Full-time equivalent student enrollment (FTE) changes over the last three years in STEM fields are as follows:

Biological Sciences 302%
Electrical Engineering 341%
Mathematics 301%
Computer Science 440%

Base on this surge in STEM enrollments we anticipate significant growth in STEM graduates over the next four years.

The primary reason for this growth has been the generosity of Anita and Truman Arnold and the gift of $10 million dollars over ten years for new student scholarships. This opportunity coupled with our summer camps in robotics, forensic sciences and other fields for bright high school students have established Texas A&M University-Texarkana as a destination point for STEM minded students. The university has initiated a number of support efforts over the last two years including the First Year Experience program, the student tutorial programs and the ASK Center designed to support students in their studies and foster increased student retention. As all of these programs are new over the last 24 months, an evaluation of the success of these initiatives is premature at this time.

External funding from federal and other sources will continue to be critical to the success of our STEM education efforts. As a small regional university, our ability to attract federal funding is limited. Unfortunately many federal grant reviewers make decisions on new grant awards based upon the previous funding history for the university. Many federal grant programs provide "bonus points" in the review

process for more "seasoned" universities with far more human and capital resources. Unfortunately, this serves as a road block for emerging comprehensive universities such as A&M–Texarkana in competing for these declining sources of support.

Access to information on various federal grant programs is available but the technical assistance critical to successfully compete for these funds is lacking. The Texas A&M University System has initiated a program of shared services designed to utilize the expertise and resources of Texas A&M University-College Station, the other regional universities and the seven state agencies within the system to assist emerging universities such as Texas A&M University-Texarkana in developing the resume and expertise critical to successfully compete for these federal resources.

In the fall of 2009, A&M–Texarkana received our first direct research grant from the National Science Foundation Grant in the amount of $300,000 to study multilayer neural network with multi-valued neurons and their application to image recognition and processing directed by Dr. Igor Aizenberg. This grant led to the creation of the award winning undergraduate computer science and electrical engineering student research team and will hopefully serve as the foundation for additional funding in this important emerging field for homeland security and medical image recognition.

Earlier this summer the University received an Environmental Protection Agency grant for $300,000 to support environmental workforce development and job training as a collaborative effort with the City of Texarkana, Texas and Texarkana College and serve as a foundation for the initiation of the new environmental engineering program at the university. We anticipate that this effort is the first step in a series of grants and partnerships to support our environmental engineering initiatives.

I would like to again express my appreciation to Chairman Hall and the membership of the Committee on Science, Space and Technology for the opportunity to present Texas A&M University-Texarkana to you this morning and our vision and please in the world of STEM education and workforce development. We have a solid foundation built in Texarkana with our partners and look forward to working closely with your Committee and various federal agencies as we together strive to regain our global prominence in Science, Technology, Engineering and Technology. I would be happy to answer any questions.

Chairman HALL. Mr. President, thank you.

And thank all four of you. That's your accolades right there. And Mr. President, I'm going to quote you many times for the future hearing when you said we launched the first STEM college.

Dr. RATHBURN. We did.

Chairman HALL. By golly, and that's something to brag about. Like Billy Dean said, "It ain't bragging if you can do it." We've done it.

That takes care of testimony for today, and now we'll have the questions. And I can take another minute and a half just to tell you a story about a guy in our hometown that his elevator didn't go all the way to the top, but he was smarter than people thought he was. They were always sending him for jobs. He'd go by the barbershop, and they'd say, "Well, somebody needs you over at the hardware store." He'd go and they didn't need him at all, but he liked the attention. They sent him to the sheriff's office one day for a deputy sheriff's job. He said, "Yes, we have an opening, but you have to answer some questions," like y'all are going to have to do here in just a minute. He said—asked him this first question, "What two days of the week starts with a T?" He said, "Today and tomorrow." He said, "Well, that's not exactly wrong, but it's not exactly right. What's one plus one?" He said, "One plus one, that makes an 11." He said, "Well, that's not really wrong, but it's not exactly right. I'll ask you the third question. Who killed Abraham Lincoln?" He said, "I don't have any idea. I never heard of it." He went on back by the barbershop, and they said, "Did you get a job?"

He said, "Get a job nothing, they already got me working on a murder case."

We have questions that we have to ask, and we're going to be brief with them. I'll start out first with the first question.

Dr. Marrett, it's good to hear about the success of the advanced technological education program in Texas, particularly the convergence technology center at colleges in Collin County. Half of Collin's campuses are in my district, and the other half's in my friend, Sam Johnson's. You describe in your testimony that there's an ATE solicitation for institutions that have either never submitted a proposal to ATE or have not submitted one in the last ten years. Could you tell us just a bit more about the solicitation and any other NSF, or National Science Foundation, opportunities in which community college, ours here, and the university representatives here today might take an interest or be well suited to pursue?

Dr. MARRETT. Thank you very much for the question. In fact, as I was preparing the material, I looked very closely at what had been the support for community colleges in Texas, by the National Science Foundation, and then thought that there really are other opportunities that should be expanded to the colleges that have not participated. What you described is something that we've recognized as an issue. We have programs, but we don't always get as full participation in those programs as would be desired. And for that reason, the advanced technological program that has said we want to target the places that have not come to the foundation for support. Now, I should note, as you know, what we do is always on a competitive basis, so coming doesn't by itself mean that there would be support, but that's one of the programs. We have others, and I'm more than willing to be the one—if anyone has questions about other programs that you can't get on our website, those people should get in touch with me. And I will tell you about other things that should be pursued.

Chairman HALL. Thank you—thank you very much.

And to any of the witnesses, there's been a lot of testimony, and we've heard a lot about students who had a difficult time transitioning from high school to college and then from a two-year institution to a four-year institution. We hear a lot about the difficulty moving from high school to college, but what are the reasons for the problem between a two-year and four-year institution and what are each of you doing in respective roles to alleviate this problem? How do you address that?

Dr. RATHBURN. Well, if I might start. And again, the unique situation because I spent 27 years at a two-year institution, and now I'm part of a university. A lot of it is conceptual. A lot of it is in the mindset of the students. We need to deal with students in a seamless environment. We talk about transitions from any educational level to another level. We need to get rid of the word "transitions." It needs to be seamless. We are already seeing the work community colleges have done, a tremendous job with dual credit enrollment in high school. We want to see that same sort of transition from the Associate's level to the Baccalaureate level. It starts first and foremost with a great academic advisor the first time the student steps onto a postsecondary campus. Building a plan that takes them from the community college through the university at

that very first step is absolutely critical. The second thing, as I mentioned in my testimony, is the vertical articulation of the curriculum itself. Too oftentimes we find students having to repeat classes or heading off on tracks at the community college that then sort of block them in the university environment. So the work that we're doing right now with our community college partners in this area is to make sure that we have not only seamless articulation, but also that we would have seamless education planning with our students as they transition postsecondary so that they can begin with the end in mind. And a lot of that is just the collaboration. I have to give all the credit in the world to the community college partners in this region for making that happen.

Chairman HALL. I think that answers the question for me, and she's nudged me three times telling me my time was up.

Ms. Johnson, I recognize you for five minutes or whatever you take.

Ms. JOHNSON. Thank you very much. Let me thank all of you for your testimony. It's been very enlightening and, the more I listen, the more the question came to my mind because it's very clear that probably the community colleges get more students that need remediation than the four-year institutions. And we talk about partnerships and it occurred to me that I have a grandson that goes to a public school that was built by Samsung in Austin, at Manor, and he's going to have 23 hours of college work when he finishes high school. How do you develop these partnerships and do these partnerships help the students be more prepared for college when they arrive?

Mr. RUSSELL. Ms. Johnson, I'll attempt to answer that first. I think you may have said Manor ISD, and if you did, that might be a partnership with the group that I mentioned a little while ago, the Texas High School Project, that not only is doing STEM education, but also the early college high school. That is so important for all of our students to start early on with that dream of college, so really, college doesn't become that big a deal. It is just a normal expectation that you're expected to move forward to. Community colleges and school districts all throughout the state are working together. Texarkana College, for example, has dual credit opportunities to 19 school districts in this area. And it is very common for students to graduate with around 30 hours. Not only is that a great start, but if you multiply the cost for that 30 hours right now for Texarkana College, that's about a thousand dollars, is what that 30 hours is going to cost. You take the savings on that compared to where you're going, you're talking $15–$20,000 a year saving the family early on. Again, as we talked about that expectation of college is huge, and then going back to Dr. Ben Carson again, I was reading on the Internet last night about his momma just refused to allow him to fail. We've got to build that family environment around every single student. Whether they have a family or we become the family, that expectation in every student is going to go to their maximum benefit. We've got to make sure that expectation is surrounding every student.

Dr. JOHNSON. If I may add, as I'm sure you recognize these problems are complex. There are a lot of different aspects that we could talk about. Let me add one that I haven't heard discussed much,

and that is the difference between the needs of our top students and the needs of our average students.

Our top students are oftentimes the ones who take advantage of the dual credit programs and who graduate from high school today with 30 or more hours. And those programs work very well for those top students, and it moves them through the pipeline quicker. And I think our transfer relationships with the universities with those students work quite well. I think the challenge that we're starting to recognize is that in STEM we need far bigger numbers. We can't compete with the top ten percent of our students if we're going to meet this challenge. And so the needs of that next 25 or 30 percent of our high school graduates are different. And one of those differences is that they tend to be less willing to move as a part of their pursuit in preparation for the rest of their life. So the geographical issues, which I mentioned in my testimony, are a bigger barrier for them and for their families than for our top students.

One of the things we're trying to do to work with that is to build dual credit CTE, or career technical education, linkages so that more of our students graduate from high school with some college associated with a particular career path. And then, as we've talked about earlier today, that stackable career credential options make more sense to them because when they walk across the stage in high school they already have a certificate that is—that leads to employable skills. And they don't necessarily see college as something only for other students. They see it as part of their own future.

Chairman HALL. Ms. Johnson, if either of us have other questions, and I have several other that I would like to have in the record, and for those on your side of the aisle, and on my side of the aisle, I think y'all would agree for us to submit those questions to you in writing. And if you'll give us your answer, your answer will be put back into the record, just as if they were here to ask the questions. Is that okay with you.

Ms. JOHNSON. That's fine.

Chairman HALL. All right. Without objection, that's the way we'll do it.

[Appendix I:]

Chairman HALL. So we'll close the second round panel and thank each one of you very much for your questions and for your answers and for your participation, for the time it took to get ready to come here, for some of you to drive here. You've been generous with your time and we're grateful to you.

Let's hear it from the crowd for them.

And while they are leaving the stage, the others—the witnesses will come forward. I'll have some encouragement for those of you who are not very good students out there. I always thought 70—anything over 70 was wasted in school for me, and I was a very poor student. I was a terrible student. My sister, my wife and my mother and all the other women in my family were teachers, and they were always embarrassed in my grades. As a matter of fact, one time I made four Fs and a D, and they said my father punished me for spending too much time on one subject. That wasn't really true, but it was almost true.

But no matter how poor a student you are, just know that somebody out there cares. And the one who usually cares the most is the teacher. Thank God for teachers. And I always think about the poet who wrote about teachers and wrote about who were the leading people in people's life and said—and was a point to him, he said, "I thank you, teacher, for all you've done for me. I thank you for reaching your hand into my heaped up heart and finding something there that no one else looked quite far enough to find." That's what teachers are for. And that's what I benefited from.

We have our panel in place now so I didn't use up any of the time. I didn't throw away any time. Was it okay with you?

Ms. JOHNSON. It's okay.

Chairman HALL. Without objection, we won't erase that from the record. We'll leave it in there.

The first round panel, I want to thank you and introduce it.

Our first witness is Ms. Pam Kennedy, Vice President of Human Resources, CHRISTUS St. Michael Health System. Originally, Mr. Chris Karam, the President and CEO of St. Michael's, he was going to represent his organization today, but impending grandfather duties required his absence. So Ms. Kennedy graciously stepped in at the last minute and said she would take over and give the testimony, and we're going to ask her to do that. I want to stay with it. I know you're prepared for it, and we want you to do it.

But Mr. Karam is here after all, and for official purposes, Ms. Kennedy will remain the official witness to provide testimony, but I'd like to ask you now to consent—or consent for Mr. Karam to join her as an accompanying witness for any questions following opening statements. Is that okay with you?

Ms. JOHNSON. That's fine.

Chairman HALL. All right. Without objection, Mr. Karam, please join the witnesses as they've all finished their opening statements. And conveniently, there's already a chair and a microphone for you over there.

Our second witness is Mr. Myron Barnett, Human Resource Manager, International Paper. He began his career with Exxon USA in technical sales in 1988, which led him to his career with International Paper.

And we're very happy to have you. And your people do visit me in Washington, and I always appreciate them.

Our final witness for this panel is Mr. Denis Washington, Chairman, TexAmericas. In addition to his role with Texas Americans Center, he serves as chairman for the Board of Commissioners for the Housing Authority of Texarkana, Texas.

As our witness should know, spoken testimony is limited to five minutes, after which the Members of the Committee will have five minutes each to ask questions. And we are trying to finish by high noon, 12 o'clock. We're on good time.

I now recognize our first witness, Ms. Kennedy, for five minutes to present your testimony. Thank you.

STATEMENT OF MS. PAM KENNEDY,
VICE PRESIDENT OF HUMAN RESOURCES,
CHRISTUS ST. MICHAEL HEALTH SYSTEM

Ms. KENNEDY. Thank you, Congressman Hall and Ranking Member Ms. Johnson. We're glad to be here today and glad to have y'all here in our community.

My name is Pam Kennedy. I'm the Vice President of Human Resources and Organizational Development at CHRISTUS St. Michael Health System, and I've been there for 24 years. And education is very near and dear to my heart. I do possess a Master's degree in science and Bachelor's in science, both of which I received in Texarkana, and I'm very excited that we have that education available to us here.

So I'm very privileged to share my testimony today. I think it's important to talk about where I work to understand the importance of the STEM education. CHRISTUS St. Michael is the second largest employer in the Texarkana area. It's a central location in Northeast Texas that allows us to serve residents of Arkansas, Texas, Oklahoma, and Louisiana. We're a 300-bed acute care hospital with a 50-bed rehabilitation hospital. We have a cancer center, outpatient rehab center, imaging center, day rehab, wound care center and two medical plazas.

The Sisters have been in the community for 95 years. And during this time, their mission has always been to extend the healing ministry of Jesus Christ. We offer comprehensive service ranging from specialized care for women, a Level III NICU, a Level III trauma center, comprehensive cancer and heart services, and we're a recognized leader for surgery, heart care, heart surgery and cancer care. With approximately 70,000 emergency department visits in 2011, we are the regional leader in specialty care.

The 50-bed CHRISTUS St. Michael Rehabilitation Hospital combines treatment and education to help patients gain independence that have been lost due to illness or injury. Some of those are occupational and speech therapy, cardiac/pulmonary outpatient rehab, respiratory care, case management, nutrition/dietary and pharmacy.

As the Sisters of Charity of the Incarnate Word for Houston and San Antonio joined congregations to form CHRISTUS Health in 1999, the leadership provided enabled our ministry to flourish and be ranked among the top ten Catholic health systems in the United States.

We're truly blessed to have the opportunities to reinvest in our community through capital expenditures for advanced diagnostic and treatment options in cancer, heart, neosurgical, neonatal, intensive care and health and wellness, as well as other areas.

The STEM workforce is imperative to healthcare. It's imperative to our workforce, our community. Science and technology are the foundation of the healthcare industry. Going forward, technology will be a key driver in providing care, our reimbursement, electronic medical records, and sharing of information via the health information exchange. In addition, we currently have two robots, one of which is DaVinci that provides less invasive prostate and gynecology service with less recovery time, and a MakoPlasty robot, which provides minimally invasive knee and hip procedures.

And definitely, it takes someone that knows about science and technology to be able to provide these services.

Other services we offer are radiology, MRI, CT, ultrasound, linear accelerator, radiation therapy and sophisticated heart catheterization. So we need to be able to provide STEM education locally so students are prepared to easily advance when opportunities present themselves. Fortunately, we have two local colleges and universities that provide nurses and other allied health professionals to our community. We found we've been most successful by growing our own within the community because they're committed to remaining in the area after graduation. Having the local school districts teaching and providing educated students to these colleges and universities is critical to our workforce. Associates having degrees at various levels of our organization include, 40 percent with Associate degrees, ten percent Bachelor's degrees, three percent Master's degrees, and probably less than one percent of Doctorate degrees. And these all involve nurses, respiratory therapists, radiology technicians, laboratory technicians, healthcare administration, pharmacists, physical therapists, occupational therapists, physicists and dosimetrists. And we all know that math plays an integral part in those, too.

For most of our Associate/Master degree programs, we can recruit within our area for the positions mentioned—above. Fortunately, Master's degrees in business, management and science are available as well. For the more advanced degree, there is normally out-migration upon completion of their degree. If the advanced degrees were offered locally, this would minimize the out-migration to other universities.

If we can provide the STEM education early in a student's educational experience, we can minimize our out-migration to larger cities around us. We also want to position ourselves to be attractive for medical tourism, and we can't do that without advanced technology.

We—at CHRISTUS St. Michael, we have a formal job shadowing program for local high school students. We participate in the Junior Achievement Board and activities to support young students, MASH program and on-site job fairs to the students so they have an opportunity to visit with healthcare professionals to plant the seeds early. To date, this has been a successful program, and we've had students attend from our local school districts here in Texarkana and surrounding areas. And this would not be possible if we were not able to provide the STEM education within our area. In order for CHRISTUS St. Michael to continue to remain viable and move forward in the industry, it's imperative we have STEM education available so that we can continue to recruit members of our community.

In conclusion, without STEM education as our foundation of science and technology, we feel we cannot have achieved national recognition for Thomas Reuters 100 Top Hospitals in Modern Healthcare, Top 100 Best Places to work. STEM education has prepared our workforce in providing the skills necessary for the healthcare industry. Thank you for the opportunity to share today and for the STEM education. And I'd be happy to answer any questions you have at the appropriate time.

[The prepared statement of Ms. Kennedy follows:]

PREPARED STATEMENT OF MS. PAM KENNEDY, VICE PRESIDENT OF HUMAN RESOURCES, CHRISTUS ST. MICHAEL HEALTH SYSTEM

Good morning, my name is Pam Kennedy and I am the VP Human Resources and Organizational Development for CHRISTUS St. Michael Health System in Texarkana, TX. I possess a Masters Degree in Science that I obtained in Texarkana, TX and I am privileged to share my testimony today about the importance of STEM Education in our community.

CHRISTUS St. Michael Health System Demographics and Mission

CHRISTUS St. Michael is the second largest employer in the Texarkana areas and is nestled within over 128 acres of oak, pine, and dogwood trees along IH-30 in Texarkana, Texas. Its central location in Northeast Texas allows CHRISTUS St. Michael Health System to serve residents of Arkansas, Texas, Oklahoma, and Louisiana.

CHRISTUS St. Michael Health System includes a 312-bed acute-care hospital, the 50-bed CHRISTUS St. Michael Rehabilitation Hospital, the W. Temple Webber Cancer Center at CHRISTUS St. Michael, CHRISTUS St. Michael Outpatient Rehabilitation Center, CHRISTUS St. Michael Health and Fitness Center, CHRISTUS St. Michael Imaging Center, CHRISTUS St. Michael Rehabilitation Hospital Cardiac/Pulmonary Rehab, CHRISTUS St. Michael Day Rehabilitation, CHRISTUS St. Michael Wound Care Center and two medical plazas.

Established in 1916 by the Sister of Charity of the Incarnate Word as Michael Meagher Memorial Hospital, CHRISTUS St. Michael Health System focuses on the mission of "Extending the health ministry of Jesus Christ." CHRISTUS St. Michael offers comprehensive services ranging from specialized care for women and a Level III NICU to a Level III Trauma Center to comprehensive cancer and heart services. CHRISTUS St. Michael is a recognized leader for surgery, heart care, heart surgery and cancer care. With approximately 73,000 Emergency Department visits in FY 2010, CSM is the regional leader in specialty care.

The 50-bed CHRISTUS St. Michael Rehabilitation Hospital combines treatment and education to help patients regain the independence that may have been lost due to illness or injury. Services include occupational and speech therapy, cardiac/pulmonary outpatient rehabilitation, respiratory care, psychological evaluation and treatment, case management, nutrition/dietary and pharmacy. A

comprehensive pre-admission evaluation of each referred patient is conducted by a skilled nurse liaison and is designed to promote a smooth transition and provide an effective program of recovery. The goal is to help each patient achieve his or her highest level of functioning and return home as quickly as possible.

As the Sisters of Charity of the Incarnate Word from Houston and San Antonio joined their congregations to from CHRISTUS Health in 1999, the leadership provided enabled our ministry to flourish and be ranked among the top 10 Catholic health systems in the United States.

It has been an exciting journey over the past 12 years, one with many accomplishments as well as challenges along the way. Establishing the Four Directions to Excellence allowed the Ark-La-Tex region to focus on the components that help us appropriately respond to the needs of our community while having positive financial results for 11 of the past 12 years. We are truly blessed at CHRISTUS St. Michael (CSM) by the opportunities to reinvest in our community through capital expenditures for advanced diagnostic and treatment options in cancer, heart, neurosurgical, neonatal intensive care, outpatient rehabilitation, health and wellness as well as other areas.

At the same time, CSM has been THE leader for our community when it comes to taking care of the poor and marginalized, whether, it's the All for Kids Pediatric Clinic, the Texarkana Community Clinic, a dental health program for the poor or the mental health crisis intervention process, it's been CSM initiating these services. For our ministry is not only "sick" care but "health" care.

Our market share has grown from approximately 30% in 1999 to 57% in 2010. CSM has received numerous awards for service and quality. CSM's patient, associate and physician satisfaction scores continually demonstrate that we have embraced the Four Directions as well as the Continuing Journey to Excellence.

All of us at CHRISTUS St. Michael are truly thankful we are the choice of more people in the four states area for health care needs. CSM is able to continue the Sisters' healthcare ministry during these often, challenging times while still being one of the CHRISTUS Health's stronger and financially performing regions.

Overview of Importance of STEM Education

A STEM workforce is imperative to healthcare, our workforce, and our community. Science and technology are the foundation of the healthcare industry. Going forward, technology will be a key driver in providing care, our reimbursement, Electronic Medical Records (EMR), and sharing of information via the Health Information Exchange (HIE). In addition, we currently have two robots, one of which is a DaVinci that provides less invasive prostate and

gynecology surgeries with less recovery time, and a MakoPlasty robot, which provides minimally invasive knee and hip procedures. We need to be able to provide this education so students are prepared to easily advance when opportunities present themselves.

Fortunately, we have local colleges and universities that provide nurses and other allied health professionals to our community. We have found we have been the most successful by "growing our own" within the community because they are committed to remaining in the area after graduation. Having the local school districts teaching and providing educated students to these colleges and universities is critical to our workforce.

Associates having degrees at various levels of our organization include:

- 40% Associate Degrees (ADN Nurses, Respiratory Therapists, Medical Lab Technicians, Radiology positions)
- 10% Bachelor Degrees (BSN Nurses, Laboratory Medical Technicians, Advanced Respiratory and Radiology positions, Management/Business Science, Social Workers)
- 3% Master Degrees (MSN Nurses, Management/Business/Educational Science degrees, Pharmacists, Physical Therapists, Occupational Therapists)
- <1% Doctorate Degrees (Advanced Pharmacist and Physical Therapy positions)

Community Resources

For most of the Associate and Bachelor degree programs, we can recruit within our area for the positions mentioned above. Fortunately, Masters Degrees in Business/Management/Science are available as well. For the more advanced degrees, there is normally out-migration for these degrees and we risk the student not returning to the area upon completion of their degree. If the Advanced Degrees were offered locally, this would minimize the out-migration to universities in other cities and states.

We participate in local community sponsored job fairs as well as providing an on-site job fair for local high schools. Normally, we have approximately 400 students from surrounding areas participate in learning more about health care. We assist with providing nursing instructors to Texarkana College; have provided Texas A & M – Texarkana with annual $25,000 donations to support the Masters of Nursing program, partnership with AHEC to provide allied health practitioners, resident program for Doctors, and a family practice for local needs in healthcare.

If we can provide the STEM education locally and early in a student's educational experience we can minimize out migration to larger cities around us and to medical tourism. We have to provide exceptional, low cost, high quality services/experiences to our patients. To avoid this, we must ensure our local

students have the tools and education to prepare them for college so they will not leave the community.

As I noted above, we provide financial assistance, assistant with providing nursing instructors to the local colleges and/or universities as well as providing clinical rotation opportunities for the students. We provide on-site job fairs, interviewing techniques, job shadowing opportunities, and clinical rotations for "hands on" experiences/training.

Community Involvement

We have a formal job shadowing program for local high schools, participate in Junior Achievement Board and activities to support young students, MASH program, and on-site job fairs so the students have an opportunity to visit with healthcare professionals to "plant the seeds" early. To date, this has been a very successful program and we have had students attend one of our local colleges and/or universities and join our workforce. This would not be possible if we were not able to provide STEM education locally and early in the student's education. In order for CHRISTUS St. Michael to continue to remain viable and move forward in the industry, it is imperative we have the STEM education available locally so we can continue to recruit members of our community.

In conclusion, thank you for the opportunity to share our concerns and support of the STEM education.

I am happy to answer any questions you may have.

Chairman HALL. Thank you very much. And we'll be asking Chris to come up whenever he wants to. You've done a very good job for him. I'm a little surprised that you've been there 24 years. I didn't know Chris and that bunch out there hired eight-year-old girls to work, but thank you for the good job you did.

Chris, you want to come up and—Chris is waiting for his grandson to be born. And I had three sons, and I had to wait in that waiting room. And had a guy in there with me, the last son. He had been there two and a half or three hours. He smoked three packs of cigarettes. Every time the door opened, he'd run to the door and look in hopefully. Finally, they came in and they said, "It's a girl." He said, "Oh, thank God. I'd hate for any son of mine to have to go through what I've had to go through out here in this waiting room."

Chris, you got another day or so to wait, haven't you? Good luck to you. And God bless the little young one that's coming into this world.

All right. I now recognize Mr. Barnett for five minutes to present his testimony.

STATEMENT OF MR. MYRON BARNETT, HUMAN RESOURCE MANAGER, INTERNATIONAL PAPER

Mr. BARNETT. Good morning.

Chairman HALL. Good morning, sir.

Mr. BARNETT. The Honorable Mr. Hall, The Honorable Ms. Johnson, I'd like to thank you for the opportunity today to appear before the Committee to discuss how a workforce skilled in science, technology, engineering and math, or STEM workforce, is critical to the success of International Paper's Texarkana mill.

Our facility is situated on more than 1500 acres in Cass County, Texas. We currently employ 120 salaried employees and 650 hourly employees who are represented by the USW, the United Steel Workers, and the IBEW, the International Brotherhood of Electrical Workers. Together, we donate more than $250,000 to our local communities in both Arkansas, and Texas, and provide community resources to the areas where our employees live and work. We also have an enormous impact economically on this region with our labor costs, our wood purchases, equipment purchases, maintenance and capital improvements. Our economic impact on this community totals nearly $300,000,000 annually.

International Paper's Texarkana mill hires across a wide range of jobs—roles that are more physically attentive to those that are very sophisticated in terms of the production and maintenance positions that operate the very latest in paper manufacturing technology. Our salaried employees have expertise in engineering, accounting, communications and other professional areas. Even in our entry level positions, it is imperative that our employees have basic computer and technology skills and have knowledge of fundamental mechanical concepts commonly utilized in manufacturing.

This is one of the reasons I'm glad to be here today. It gives me the opportunity to share with this Committee some very important points. First, our enthusiasm and appreciation for our current workforce at International Paper. Second, the fact that we are seeing an entire generation of highly skilled employees at all levels of

our organization retire at a very rapid pace. And third, in light of this changing dynamic, the need for us to modify our recruiting strategies in a way that causes us to depend even more on our current educational systems to produce a well-educated workforce. This last element is essential to the current and future success of our business.

We define our workforce both in terms of production and maintenance employees and engineering and management employees. As it relates to engineers, we recruit primarily chemical, mechanical, electrical and environmental engineers. While International Paper has a coordinated national recruiting program in which we participate, we focus on local recruiting efforts at Louisiana Tech, but I would also add that several of our engineers are graduates from Texas A&M. Over the years, including recently, we have been very successful finding technically trained engineers to help us meet our business needs.

Regarding production employees, we're looking for individuals that have good computer knowledge and a basic mechanical aptitude. Maintenance mechanics must be skilled in areas like welding, pipe fitting and machining. Instrument electricians must understand motors, handling low, medium and high voltage, programmable logic controls in DCS technology.

From a recruiting standpoint, we have been fortunate to find skilled production and maintenance employees from our local communities, but please understand that this is getting more and more difficult. As the human resources manager at our facility, I believe that in order to avoid a disconnect between the jobs that we all want to see kept in the United States and our workforce's ability to perform these jobs well, then we simply have to be more successful educating production and maintenance employees earlier during the high school years. We must establish more collaborative efforts between the manufacturing world and the world of education to expose students to manufacturing-oriented technology. As we evaluate hundreds of candidates for well-paying jobs, we don't regularly see the type of exposure to technology that makes for a skilled workforce that will have to compete in a global economy. And ladies and gentlemen, familiarity with video games and smartphones and the latest APs just won't cut it.

At this time, the Texarkana mill has begun work with Texarkana College on this type of training and skills development effort. This is something we must do, but it can't just occur at the collegiate level. Our high schools will also play a critical role in helping inspire a future skilled workforce.

Finally, I'd like to thank the Committee for allowing me to represent the employees of International Paper Texarkana mill in this forum today. This is a critical subject, and it will impact the success of both this community and our business. You see, our futures are truly interconnected. For we, indeed, are in this together. I appreciate your time, and thanks again for inviting me to be involved in today's hearing.

[The prepared statement of Mr. Barnett follows:]

PREPARED STATEMENT OF MYRON BARNETT, HUMAN RESOURCES MANAGER, INTERNATIONAL PAPER TEXARKANA MILL

Chairman Hall and Congresswoman Johnson and Members of the Committee, I am Myron Barnett, Human Resources Manager, at International Paper's Texarkana Mill. I'd like to thank you for the opportunity to appear before the Committee today to discuss how a skilled STEM (Science, Technology, Engineering and Math) workforce is critical to the success of International Paper's Texarkana Mill. The Texarkana Mill is a part of International Paper, a company which currently employees 60,000 employees in more than 24 countries. International Paper is a global leader in the paper and packaging industry with manufacturing operations in North America, Europe, Latin America, Asia and North Africa.

The facility that I'm representing in Texarkana is situated on more than 1,500 acres in Domino, which is a part of Cass County, Texas. In 2012, we will celebrate our 40th Anniversary at the Texarkana Mill. We currently employ roughly 800 hourly and salaried employees. We have an enormous economic impact on this region. With labor, wood purchases, equipment, maintenance and capital improvements our economic impact in this community totals nearly $300 million annually. Most economists would say that you could multiply that figure times three or five in total direct and indirect economic impact. We are truly committed to the communities where our employees live and work. In addition to the economic impact we have in this area, we contribute more than $250,000 to the local community through foundation grants, community giving and our annual United Way campaign.

International Paper's Texarkana Mill hires for a wide range of jobs from manual labor to automated equipment operators to maintenance, mechanical and instrument electricians. We also have a large number of salaried employees with expertise in engineering, accounting, communications, human resources and other professional areas.

At our most entry level positions, it's imperative that our employees have basic computer and technology skills and have knowledge of routine procedures within the manufacturing environment. Not only do they need these skills, but they also need training in critical thinking and problem solving. This is one of the reasons I'm glad to be here today—it gives me the opportunity to let this Committee know that we have a solid workforce at International Paper, but we definitely see areas where we could improve our recruitment efforts early in the education system. With an entire generation of skilled employees at all levels retiring at a rapid pace, an educated workforce is essential to the success of our business.

We define our workforce both in terms of production and maintenance employees versus engineering and management employees. When we speak to our engineering employee base we're looking at chemical, mechanical, electrical, civil and environmental engineers. It's imperative that on the production and maintenance side that we're looking at individuals that have good computer knowledge, PLC's and are skilled from a technical standpoint. It is our company's preference to have production employees who have exposure to technology in areas like DCS (Distribution Control Systems), as well.

From a recruiting standpoint, we have been fortunate to find employees from production, maintenance as well as our salaried employees locally and in surrounding areas. However, that is getting more and more difficult. Our company has a broad based recruiting effort at major universities across the country, but locally we focus much of our recruiting efforts at proven successful engineering schools like Texas A&M and Louisiana Tech.

As the Human Resources manager at this facility, I'm believe that in order to avoid a disconnect between the jobs we want to the keep in the U.S. and our workforce's ability to perform these jobs, that we simply have to start educating production and maintenance employees earlier in the high school years. By doing this we expose students and potential employees to computers and technology as well as opportunities available to them after high school and college. Frankly, we don't see the type of exposure to computers and technology that makes for a skilled workforce happening at this time outside of video games, smart phones and apps.

At this time, our company is not working with local colleges and universities on training programs, but it's something we'd like to get involved with. Not just at the collegiate level but also with local K–12 schools that help inspire a future STEM workforce.

I'd like to thank the Committee for allowing me to represent the 800 International Paper employees here in Texarkana. This is a critical subject for recruitment and I appreciate your time and inviting me to be involved in today's hearing.

Chairman HALL. And we thank you. You've had some problems with fires, have you not, in your home county, in that area? I heard, I think on TV this morning, our governor is headed back from Florida, to Austin to go to work for us—continue working for us to get some help from the federal government on that.

And I'm—I have never—in my 88 years, I have never seen the likes of earthquakes, of fires, of hurricanes and tragedies like that. Maybe they just didn't print them before. Maybe we just didn't know about them and we had them, but I don't remember it being this bad. Do you? Any of you remember it being like the way it is here, the people, the deprivation, the hardship, the— the injuries, the deaths of so many people. It's just amazing. Probably need to spend more time on our knees, by golly, but we are praying for your folks and—and pray that we get some help for them quickly. I know they need it.

I now recognize, excuse me, our final witness for this panel, Mr. Washington, for five minutes.

Mr. Washington, thank you.

STATEMENT OF MR. DENIS WASHINGTON, CHAIRMAN, TEXAMERICAS

Mr. WASHINGTON. And thank you, Mr. Chairman and appreciate the opportunity to speak on behalf of this testimony today.

My name is Denis Washington. I'm the Chairman of the Board of Directors of the TexAmericas Center. As you may know, the TexAmericas Center was established in 1998 by the Texas State Legislature as a special purpose district. Its mission has been to redevelop excess military properties subjected to both the 1995 and 2005 rounds of Base Realignment and Closure. Our goal has been to place the property at Red River Army Depot and the former Lone Star Army Ammunition Plant back into productive use with emphasis on job creation, job retention and increase in tax base.

The organization's name used to be Red River Redevelopment Authority, but was changed in 2011, to TexAmericas Center to create a more—to create a more defined identity that attracts businesses interested both nationally and globally in our location.

Our board is composed of appointees of the mayors of all the cities within Bowie County plus appointees by the Bowie County Commissioners or the County Judge. The 15 members of our board, our staff and the communities we serve have stood united in efforts to enhance the lives of our citizens with the preservation of existing workforce to attract new businesses.

There is one figure in particular who has stood tall for all of us through the BRAC Process and related transition issues that have affected our community. Mr. Chairman, you have been a guiding light for our mission and our successes, and we are thankful for the significant amount of time and energy you devote to promote and serve this community's needs. Without you, the successes we enjoy so far would not be possible.

Mr. Chairman and Ranking Member Johnson, on behalf of TexAmericas Center Board, I'd like to thank you for the opportunity to give this testimony, and thank you for being here in this brand new facility.

I'd also like to share with you some accomplishments the TexAmericas Center has experienced in support of local workforce development. I would then like to share with you some of the things we are doing now in support of collaborative efforts with industry, schools and institutions of higher learning.

Today, companies and government organizations located at TexAmericas Center boast nearly 1,000 jobs. Support for Red River Army Depot is a strong component of what TexAmericas Center does. 75 percent of the jobs reported there are attributed to both government and commercial support for the depot. While we have been a strong part of the depot, we understand we must insulate it for future rounds of BRAC.

Roughly 25 percent of employees at TexAmericas Center work in one of 13 non-federal related companies we host. Staff reports one in three companies per month come to us seeking space. Whereas a significant number of our prospects once were searching for warehouse space, they are now seeking acreage to create industry, energy and technology-oriented businesses.

During fiscal year 2011, 12 prospects expressed an interest in relocating or establishing their businesses' operations on TexAmericas Center's properties. These entities' projected investments were in excess of $1.8 billion and will create approximately 2500 jobs. While the site selection process continues with some, we realize that not only are they interested in land, water resources, utilities, infrastructure and transportation, but a desire to know more about our cultural activities, professional job opportunities for spouses and the local education system and curriculum. What was considered by our board members to be quite unique, it was entity's inquiry about our proximity to international schools, meaning a school that provided instruction to multiple languages and had a diversity of students and curriculum. Our CEO remarked to our board that, "World class academic credentials are critical to international companies."

TexAmericas Center spends a great deal of time and energy pursuing new opportunities, but it is also appropriate to acknowledge our close working relationship and efforts with the City of Texarkana, Texas, the State of Texas Department of Economic Development and Tourism and Texas A&M University in a collaborative role in economic development. We continue to forge these relationships knowing that the entire community benefits from all our endeavors, including—business relocation and employees and families that choose to reside in our region.

TexAmericas' acquisition of 12,000 acres of land formerly occupied military installations that supplied various war theaters are now being returned to the community to a different productive use. To ensure a reintroduction of the properties to the community, we realize the importance of teaming with our school and our institutions of higher learning. Let me share with you some of our recent initiatives. TexAmericas Center is a participant in the Pre-K–16 education initiative where STEM education pathways are a predominant focus. TexAmericas Center is also part of the Texarkana Market Analysis Project and Business Advisory Council at Texas A&M Texarkana. These networks help us to find ways to deploy business solutions and engage the academic community on ideas,

including the STEM curriculum. The Dean of the Engineering College at A&M and TexAmericas Center's CEO has been in detailed discussions about the use of TexAmericas Center as a living laboratory for environmental issues ranging from support for the Army's over $2,000,000 environmental restoration program and TexAmericas Center's materials reclamation program, which we are demolishing the old facilities and reusing the materials. TexAmericas Center is working with a division of Texas A&M University College Station to deploy millions of dollars in surplus electronics recycling production equipment in a for-profit model and working with the system's industrial alliances branch to bring high-tech manufacturing to our region. At the community college level and local school district level, TexAmericas Center's CEO has met with the President of Texarkana College and briefed the Texarkana Independent School District's science faculty and administration on collaborating on a life education center for both faculty continuing education and classroom enrichment. This past summer, TexAmericas Center initiated our first ever comprehensive summer internship program, which we introduced juniors, seniors in high school and college students to the world of work. We interned four students this year and plan to expand to six or more next year. Two of the students worked independently in the field doing water chemistry on the public drinking water system and their work efforts actually helped effectively implement our water compliance program this summer. Recently, TexAmericas Center collaborated with Texarkana College for the creation of a workforce training center. Branded Texarkana College at TexAmericas Center, this satellite campus is intended to support the academic and workforce training for Red River Army Depot, local commercial companies, as well as provide dual credit courses with the surrounding community high schools. The over 5,000 jobs of Red River Army Depot and its associated contractors can use the facility to develop their technical skills and progress towards degree completion.

In our efforts to characterize the potential use of our property, we are dedicated to attracting compatible industries with our adjacent communities. We believe that being centered on job creation should not sacrifice the quality of life for our neighbors.

I believe that TexAmericas Center can be a stabilizing force for the economic future of Northeast Texas and Southwest Arkansas. In order to achieve that mission, the education system and job opportunities combined with economic development must share the a vision of the needs for our workforce and for those industries and companies we wish to attract.

As I conclude, I would like to share a couple of thoughts. First, STEM is an integral part of our success independent in our children and this community. Those existing skill sets and those being developed within our workforce will be vital to our mission in trying to persuade prospective companies to relocate or expand operations in this region. In preparing our students for the challenges ahead, the greater the opportunity they are provided to have hands-on experiences, the more likely they will gravitate to a productive and rewarding career. We see this nexus as a key to a community's long-term future.

So on behalf of the board, I thank you for your service, your kind attention for making the trip to Texarkana and support for STEM education.

[The prepared statement of Mr. Washington follows:]

PREPARED STATEMENT OF MR. DENIS WASHINGTON, CHAIRMAN, TEXAMERICAS

My name is Denis Washington and I am the Chairman of the Board of Directors of the TexAmericas Center.

As you may know, TexAmericas Center was established in 1998 by the Texas State Legislature as a special purpose district. Its mission has been to redevelop excess military properties subjected to both the 1995 and 2005 rounds of Base Realignment and Closure. Our goal has been to place the property at Red River Army Depot and the former Lone Star Army Ammunition Plant back into productive use—with emphasis on job creation, job retention, and increase in the tax base.

The organization's name used to be Red River Redevelopment Authority, but was changed in 2011 to TexAmericas Center to create a more defined identity that attracts interested parties both nationally and globally to our location.

The Board is composed of appointees of the Mayors of all the Cities within Bowie County plus appointees by the Bowie County Commissioner's Court and County Judge. The 15 members of our Board, our staff and the communities we serve have stood united in an effort to enhance the lives of our citizens with the the preservation of the existing workforce and to attract new business.

There is one figure in particular who has stood tall for all of us throughout the BRAC Process and related transition issues that have affected our community . . . Mr. Chairman, you have been a guiding light for our mission and our successes, and we are thankful for the significant amount of time and energy you devoted to promote and serve this community's needs. Without you, the successes we have enjoyed so far would not be possible.

Mr. Chairman and Ranking Member Johnson on behalf of TexAmericas Center Board, I would like to thank you for the opportunity to give this testimony, and thank you for being here today in this wonderful new building.

I would also like to thank Superintendent Paul Norton for the Texarkana Independent School District's hospitality today.

Mr. Chairman, I would like to share with you some of the accomplishments TexAmericas Center's has experienced in support of local workforce development.

I would then like to share with you some of the things we are doing now in support of collaborative efforts with industry, schools and institutions of higher learning.

Today, companies and government organizations located at TexAmericas Center boast nearly 1,000 jobs.

Support for Red River Army Depot is a strong component of what TexAmericas Center does . . . 75% of the jobs reported here are attributed to both government and commercial support for the Depot. While we have been a strong partner with the Depot, we understand that we must insulate it from future Base Realignment actions.

Roughly 25% of employees at TexAmericas Center work in one of the 13 non-federal related companies we host. Staff reports that 1–3 companies per month come to us seeking space. Whereas a significant number of prospects once were searching for warehouse space, they are now seeking acreage to create industrial, energy and technology-oriented businesses.

During FY 2011, twelve prospects expressed an interest in relocating or establishing their business operations on TexAmericas Center's property. These entities' projected investments were in excess of $1.8 billion and could create approximately 2,500 jobs. While the site selection process continues with some, we realize that not only are they interested in the land, water resources, utilities, infrastructure, and transportation, but desire to know more about cultural activities, professional job opportunities for spouses, and the local educational system and curriculum. What was considered unique by our Board Members, was one entity's inquiry about our proximity to international schools—meaning a school that provided instruction in multiple languages and had a diversity of students and curriculum. Our CEO recently remarked to our Board that, "World class academic credentials are critical to international companies."

TexAmericas Center spends a great deal of time and energy pursing new opportunities, but it is also appropriate to acknowledge our close working relationship and efforts of the City of Texarkana, TX, the State of Texas Department of Economic Development and Tourism and the Texas A&M University system in their collabo-

rative role in economic development. We continually forge these relationships knowing that the entire community benefits from all our endeavors including but not limited to new business relocation, and the employees and families that choose to reside in our region.

TexAmericas Center's acquisition of 12,000+ acres of land formerly occupied military installations that supplied various war theaters, are now being returned to the community for a different productive use. To ensure a wise re-introduction of the properties to the community, we realize the importance for teaming with our schools and institutions of higher learning. Let me share with you some of our recent initiatives.

1. TexAmericas Center is a participant in the PK–16 education initiative where STEM education pathways are a predominant focus.
2. TexAmericas Center is also part of the Texarkana Market Analysis Project and Business Advisory Council at Texas A&M Texarkana. These networks help us find ways to deploy business solutions and engage the academic community on ideas, including the STEM curriculum.
3. The Dean of the Engineering College at A&M and TexAmericas Center's CEO have been in detailed discussions about the use of TexAmericas Center as a living laboratory for environmental issues ranging from support for the Army's over $200M environmental restoration program and TexAmericas Center's materials reclamation program where we are demolishing the old facilities and reusing the materials.
4. TexAmericas Center is working with a division of Texas A&M University in College Station to deploy millions of dollars in surplus electronics recycling production equipment in a for-profit model and working with the System's industrial alliances branch to bring high tech manufacturing to our area.
5. At the Community College and local School District level, TexAmericas Center's CEO has met with the President of Texarkana College and briefed the Texarkana Independent School District's science faculty and administration on collaborating on life sciences to include the development of an outdoor education center for both faculty continuing education and classroom enrichment.
6. This past summer, TexAmericas Center initiated our first ever comprehensive summer internship program where we introduce juniors/seniors in high school and college students to the world of work. We interned four students this year and plan to expand to six or more next year. Two of the students worked independently in the field doing water chemistry on the public drinking water system and their work efforts actually helped effectively implement our water compliance program this summer.
7. Recently TexAmericas Center collaborated with Texarkana College for the creation a workforce training center. Branded "Texarkana College @ TexAmericas Center", this satellite campus is intended to support the academic and workforce training for Red River Army Depot, local commercial companies as well as provide dual credit courses with the surrounding community High Schools. The over 5,000 employees of Red River Army Depot and its associated contractors can use the facility to develop their technical skills and progress towards degree completion.

In our efforts to characterize the potential use of our property, we are dedicated to attracting compatible industries with our adjacent communities. We believe that being centered on job creation should not sacrifice the quality of life for our neighbors.

While some may say that education is abandoning academia for workforce education, it is our business leaders that share a desire for a more work-ready product. Current Texarkana, Texas City Manager, Dr. Larry Sullivan, in his former position as Texarkana Independent School District Superintendent, once solicited feedback from a group of businessmen and women. He asked them to tell him about the skills they desire to see in the product they were turning out. How can we better prepare them before they arrive at your door? To take it a step further, how do we attract, retain and convince those students to return to Texarkana should they go away for college and complete their degrees?

I believe that TexAmericas Center can be a stabilizing force in the economic future of Northeast Texas and Southwest Arkansas. In order to achieve that mission, the education system and job opportunities combined with economic development must share the vision about the needs for our workforce and for those industries/companies we wish to attract.

As I conclude, I would like to share a couple of thoughts.

STEM is an integral part of the success of our children and this community. Those existing skill sets and those being developed within our workforce will be vital to our mission in trying to persuade prospective companies to relocate or expand their operations in this region. In preparing our students for the challenges ahead, the greater the opportunity they are provided to have hands—on experiences, the more likely they will gravitate to a productive and rewarding career. We see this nexus as a key to a community's long-term viability.

So, on behalf of our Board, I want to thank you for your service, your kind attention for making the trip to Texarkana to show your support for STEM Education in Action: Preparing for Jobs of the Future.

Chairman HALL. Mr. Washington, we thank you. And I personally thank you for your input in holding two groups together where both groups benefited for Bowie and for the area here. Y'all did a good job. And you named a lot of people. The Secretary of the Army happened to be Pete Geren at that time, a gentleman from Fort Worth. And I don't know why I knew everybody's grand-daddy, but his father was—was one of my best friends, and Pete was the Secretary of the Army the two years we were battling to see if we could keep that land out there for Bowie County. And you succeeded, and I thank you personally for all you did. Thank you——

Mr. WASHINGTON. Thank you for your effort.

Chairman HALL. Now, I think that is our witnesses. We're going to have questions now, and we're limited to five minutes. I think we have—we're doing pretty good time wise.

I'll start off with the first question. And I thank all of you for being here, preparation, travel time and all that. And my first question will be to any witness who wants to answer. What role do each of your organizations play in helping to inspire our nation's youth about the importance of STEM education? What do y'all do and do you encourage your staff to serve as mentors to their children's classrooms or offer tours of your facilities so children can learn about how a medical center runs or—or how engineering plays a role in the creation of paper for the paper mill? Gentleman there. Any of you that want to answer that, take a shot at it. What are we doing to enroll kids and encourage them to come on in and be a part here and then be successful?

Mr. WASHINGTON. Well, Mr. Chairman, I'll begin with our initial program at TexAmericas Center involving the internship program. You know, we realized that our mission continues to change on a daily basis. Our whole system involves them on a regular basis. And I believe that with the environmental cleanup that we have available, the partnerships that we have with the universities, that we can be able to employ the use of some of those students to be able to expand the research they need to do, as well as to provide some of the manpower we need to accomplish our mission.

Chairman HALL. Are there others, others who want to take a shot at that.

Mr. KARAM. Mr. Chairman, at CHRISTUS St. Michael, we are very involved in the community with Junior Achievement, as well as we have a fairly robust student volunteer program. It's amazing how many of God's children eventually become our associates. And it's great exposure. A lot of children want to know what that's like and that gives them the opportunity by being a junior volunteer. We also have a shadowing program, where students can come through the organization. We do multiple tours of the hospital so that students can come through and see the different areas so they

think about their future. And then we also work with some of the area organizations when they actually go ahead and actually follow a profession through different programs and see if that's something they might be interested in.

Chairman HALL. You know, during the last three years, and as we were pushed into the arena and you were carrying out the request that Congress had made, I had some whispers around that you were fearful that you were overly educating those and that they wouldn't be whole and complete students when they got to the end of the road. Do you remember that, that there was some suggestions of that.

Mr. KARAM. Well, I—I do remember that——

Chairman HALL. I never was overeducated myself. Nobody ever——

Mr. KARAM. Well, we never felt like that was really an issue. I think the concern was that people would maybe find they weren't challenging enough.

Chairman HALL. Yeah, yeah. Any others care to——

Mr. BARNETT. Yes, Mr. Chairman——

Chairman HALL. Yes, sir.

Mr. BARNETT. —I guess I would add that we at the International Paper facility in Texarkana, we have an internship program for engineers that we just reinvigorated the last 12 months. We're for 12 months out of the year, we have a student who is either a chemical engineer or mechanical engineer, normally is working during an off semester or during the summer at the mill doing engineering work side by side with our employees. And so it's a great opportunity for them financially and experientially. In addition, I've been involved. As a matter of fact, just last year, I went in to speak at the Liberty-Eylau High School and talked to a classroom about leadership and what it means to be a leader, not just in the workplace, but in society at large because we need that. Our country needs that in both realms.

Chairman HALL. I thank you. My time's expired.

Ms. Johnson, I recognize you.

Ms. JOHNSON. Thank you very much. Thanks to all of you for being here. I know that population wise this is not the fastest growing area, but yet you have thriving businesses. And, of course, we'll always have a need for health facilities. So I'm interested in how early you get involved, and I think some of that's been answered with internships, in attracting young people to be anchored to the area with the proper background and STEM education and their excellent education facilities here. And to do that, you almost have to touch the parents, of course, and the K through 12 teachers. What activities do you have that would be inclusive of students coming through the primary and secondary education and their parents and teachers? Anybody.

Well, we all say that you've got to involve parents. You are in businesses that must continue to attract qualified people in the STEM areas for your success. And it's in an area— now, in my area, we'd like to share some people. We are growing. We are the fastest growing area in the country in the Dallas-Fort Worth area, but we know that as we grow other areas are losing some population. And yet, we want to be certain that when products, whether

they be for healthcare or paper, we want to feel certain that they are coming from areas that are equipped with the best minds as well, not that we have any—we don't have any kind of over supply of good minds just because we have a lot of people. But I'm very concerned about the survival and the quality survival of areas that have a diminishing population, and how you are beginning to address that or how you have addressed that beyond the traditional involvements, which must include teachers' experience in what the workplace is like, rather than just the classroom, and our parents understanding the changing demands on the educational process and how important it is. And I just thought you mentioned some internships. Does that include teachers? Give me an idea of how you are fertilizing the whole area to make sure you have a supply of qualified people.

Ms. KENNEDY. I think one of our biggest things that we've done is working with Junior Achievement. And we actually have people from the hospital who go out and teach classes with the young students, like elementary type students, teaching them math, reading to them and engaging them at a very early age. We also have our on-site job fairs, and we do invite the teachers to come and participate as part of that so that they understand what healthcare offers. I mean, it's more than just nurses. There's a lot of different venues that they can go into, and the teachers then can take that back to the classroom and share that appropriately.

Ms. JOHNSON. Um-hmm. And the tremendous changes that are taking place with technologies in the delivery of healthcare, too.

Ms. KENNEDY. Well, everything now is automated. We continue to grow more toward technology, and I think as Mr. Barnett stated, talking about smartphones, and I mean, there's so many things in healthcare you can actually do with a smartphone now.

But it is challenging because we have to keep up with that technology and have the people to be able to do that to advance us forward in the healthcare industry.

Mr. KARAM. Ms. Johnson, we also have 2100 associates, 300 physicians on our medical staff. We go out in the community, do regular community health screenings and other activities, involved in almost every health-related fundraiser out there. And what I see the biggest exposure for young people is that ripple effect. Those folks recognize that while they're talking to those folks they respect and they talk about healthcare as a career and that's where we get a lot of people excited about coming into the healthcare career.

Ms. JOHNSON. Um-hmm.

Mr. WASHINGTON. I believe one thing, too, that we have to realize is that in order for—it really depends upon how we sell our community. And one of the greatest things that has happened to us has been the introduction of Texas A&M University in our community and opportunities passed on to students to stay at home but also for continuing education. Many times we're looking at new businesses that are coming to the TexAmericas Center, they're people that are coming in are interested in our education system. They're looking at the culture things that's available to them.

So it's really a community as a whole that we must sell to entice them to feel that this is a very good place for their kids. What happens to those that graduate from college and decide to come back

here, I think those are going to be the challenges that we can't go against in places like Dallas and Houston and things that young people desire, but one thing we do offer is a great place to live. We offer a good education system to continue their postgraduate work, as well as to live in this area. So those are things that we must harp on to try to attract and retain our students to come back and our children to come back here to live.

Ms. JOHNSON. Thank you very much. Let me just comment that what I've heard since I've been here this morning, I have been very, very impressed. First, I've seen a very clean city that seems to have all of the ingredients, including the arts and—and the job picture and the diversity of the educational offering and the healthcare. I would say thank you for even accepting—did we ask or did they ask us or whatever—for us being here because I see some uniqueness, and I want to applaud this entire community for that. And I think that as long as you continue that, you won't have to worry about too many of them not coming back. Thank you.

Chairman HALL. Eddie Bernice and I thank you, and thank you for those kind remarks because these are the same people and this is the same area when we were about to lose Red River, we talked the Chairman of that Committee into coming here and their vote, out of a group of nine, they had six votes too close us. At that time, all your State representatives, some of the representatives from Arkansas, and us urged the Chairman just to come here and see the facility. And I'll tell you what did it for him. When he drove that ten miles from where you leave the highway and you get over there, they were probably 10,000 people there with signs saying, "God bless you, Mr. Chairman, thank you, Mr. Chairman, God bless you for coming to Bowie County," and that just turned him around. He changed his mind then when he saw what kind of people, and that's what people's for. That's the thrust of good people that cared. And they're here today because they care. And this is a good meeting. And we will have other questions to ask you and submit them to you. And Eddie Bernice can offer those, and she can offer her people on her side of the aisle the opportunity to ask questions if they need to. They will go into the record, and we'll see that that's done. This has been a good recording. It's been a good attendance. You've given good answers. I hope we've asked proper questions.

We're honored to be here, but the round of questions is completed, and we've completed them on time. And I don't know if it's over budget or under budget, but we have completed them. We thank you, and we thank all the witnesses on both panels. And thank Eddie for her attendance here and for her questions. And Members that are not in attendance may have additional questions. We'll keep the record open for two weeks for additional comments from the Members. And once again, thank you very much. The witnesses are excused and this hearing is adjourned.

[Whereupon, at 11:48 a.m., the Committee was adjourned.]

Appendix I

Answers to Post-Hearing Questions

ANSWERS TO POST-HEARING QUESTIONS

Responses by Dr. Cora Marrett, Deputy Director, National Science Foundation

Question submitted by Chairman Ralph Hall

Question 1: ***We have heard testimony that it is difficult for community colleges to get NSF funding due to inexperience in grant-writing and the perception that it mostly funds research institutions. How does NSF reach out to community colleges and smaller 4-yr schools about its programs and opportunities for funding? Can you also address the ways the Foundation provides assistance with grant-writing?***

Response: Each year, the National Science Foundation (NSF) provides numerous outreach training sessions to inform colleges and universities about its programs and outline procedures for submitting grant proposals to the agency. These activities are supplemented by discipline-focused workshops, conferences, and professional meetings that encourage and train faculty at all institution types to pursue NSF support. Community colleges and smaller four-year colleges are regularly invited to participate in these opportunities to ensure the submission of highly competitive proposals from their institutions. In FY 2011, NSF's overall success rate was 22 percent; notably, 21.5 percent of proposals submitted to the agency by community colleges were funded.

The Foundation employs a number of outreach tools in order to assist community college faculty members in identifying NSF funding opportunities and preparing proposals. For example, the NSF Advanced Technological Education (ATE) program—which focuses on two-year colleges and expects two-year colleges to have a leadership role in all of its projects—has made awards to community colleges to develop resource centers (http://atecenters.org). Through these centers, community college faculty members have access to resources for developing and writing proposals, to information on managing projects, and to guidance for effectively interacting with their institutional support staff and administrators. The ATE program also supports workshops by the American Indian Higher Education Consortium to assist faculty in proposal preparation. NSF works cooperatively with the American Association of Community Colleges (AACC) to advise faculty members on NSF funding opportunities, and NSF program officers regularly make presentations at AACC conferences.

Further, The Quality Education for Minorities (QEM) Network, based in Washington, DC, has been funded by NSF to provide technical assistance to increase the participation of faculty members from minority-serving institutions (of which there are a number of qualifying community colleges) in NSF's Math and Science Partnership (MSP) Program and in the Robert B. Noyce Teacher Scholarship program. QEM has also received funding from the NSF Directorate for Education and Human Resources (EHR) and the Directorate for Engineering (ENG) to provide mentoring to faculty in minority-serving institutions, including advice on successful proposal writing.

NSF program officers regularly participate in regional or local NSF conferences such as "NSF Day" workshops and Regional Grants Conferences, some of which are specifically organized for community

colleges.) They also participate in meetings and conferences, such as the American Association of Community College events, that involve community colleges at which they make presentations on funding opportunities and proposal writing. Community college faculty members are regularly invited to serve on NSF grant review panels, which provide an opportunity to become aware of the qualities of competitive proposals.

In FY 2012, NSF, through research and education investments to community colleges, and the Advanced Technological Education (ATE) Program, which has historically been the primary EHR vehicle for engagement with community colleges, will anchor EHR's newly coordinated efforts toward a more comprehensive and systematic engagement with the Nation's community colleges. Drawing on ATE program expertise, the following EHR undergraduate education programs will work synergistically to engage community colleges and address community college priorities:

- *Federal Cyber Service: Scholarship for Service/Cybercorps (SFS)*;
- *Historically Black Colleges and Universities Undergraduate Program (HBCU-UP*); and
- *Louis Stokes Alliances for Minority Participation (LSAMP)*;
- *Math and Science Partnership (MSP)*;
- *Robert Noyce Teacher Scholarship (NOYCE);*
- *Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM);*
- *STEM Talent Expansion Program (STEP)*;
- *Transforming Undergraduate Education in STEM (TUES)*;
- *Tribal Colleges and Universities Program (TCUP).*

Question 2: ***How do both 2-yr and 4-yr institutions cope with the fast-paced changes in modern technological advances and the specialized requirements for many 21st century technical jobs when it comes to keeping the curriculum current to meet the needs of the employers?***

Response: NSF continues to collaborate with industry and professional societies to ensure that curricula are current and innovative, and that cutting- edge technology is incorporated in all NSF-funded STEM technician education programs. A mechanism used by both two-year and four-year institutions to deal with rapid advances in technological fields is the establishment of strong industry partnerships—an essential feature of NSF's Advanced Technological Education (ATE) program. The ATE program requires the educational community to partner with both industry and economic development agencies to respond to workforce needs. This requirement has led to industry representatives serving on advisory boards for technician education programs; becoming adjunct faculty and teaching courses within the programs; developing curricula that are responsive to industry needs; and providing internship opportunities for students in technician education programs. Industry representatives help inform curriculum development and provide the training on the latest technological advances within their field.

Technician education programs housed in community colleges have developed several mechanisms to serve both prospective students and incumbent workers. Many programs offer "quick" courses on specific techniques, certificates requiring various numbers of credits, and Associate in Science (A.S.) degrees to meet a variety of student and industry needs. Community colleges are developing Contract Research Organizations (CROs) on their campuses, and both high school and community college students work on local industry projects. A number of ATE-funded projects integrate industry

certifications into their academic programs. For example, manufacturing technician education programs are using the National Association of Manufacturer's credentials that are industry certified and validated. Technician education programs in information technology and aerospace are also embeding certifications in their academic programs.

Responses by Mr. James Henry Russell, President, Texarkana College

Question submitted by Chairman Ralph Hall

Q1. How do both two-year and four-year institutions cope with the fast-paced changes in modern technological advances and the specialized requirements for many 21st century technical jobs when it comes to keeping the curriculum current to meet the needs of employers?

A1. This would be a great topic for a Doctoral Thesis. I will attempt to share a few things that are going on with the Texarkana PK–16 council that attempt to move in this direction. The most important thing you can do to ensure that all educational institutions are keeping in tune with the needs of employees is for there to be great communication between all parties involved. In many communities, the four year institution does not get along that well with the two year and neither one talks very much to the Pk–12 institution. Also, no one even considers involving the business sector in this discussion. This system of a lack of communication used to be the case in this area too. While we are certainly far from perfect, I think the Texarkana area has moved ahead of the pack in the area of fostering great PK–16 collaboration that is reaching out to the business community, listening to what they have to say, and designing the curriculum to meet their needs. Not only are all parties involved in the design stage, but they are also involved in the process along the way to monitor and adjust. This can best be shown by a tour of the STEM PK–16 alignment that exists in Texarkana between the Texarkana Independent School District, Texarkana College, Texas A&M Texarkana, and various industries throughout the area. A real need for employees in the STEM area has driven the PK–16 education delivery model in this area. The PK–16 institutions provide business and industry properly educated and trained employees. This model is now being moved to other areas including workforce education. Again, I believe the key is for open and honest communication and feedback to be constantly occurring between PK–16 institutions and the business and industry sector. It sounds easy. I think in most places you will find that it does not happen often and openly.

Q2. Which partnerships that you have established with local, regional, state, federal government and non-government entities have proved to be the most challenging to form? Why were they challenging, and how were you able to overcome them?

A2. The partnership with the most potential for success in the near future is our brand new TC@TexAmericas Site. This is a branch location of Texarkana College located adjacent to the Red River Army Depot Headquarters and on TexAmercias property. TexAmericas is the entity that has received thousands of acres from the most recent base realignment and closure process. This facility is meant to be able to quickly adjust to the training needs of the army depot or the next industry that TexAmericas is recruiting to bring in to their available sites. TC at TexAmericas required partnerships to be formed between the Federal Government, U.S. Army, State of Texas, TexAmericas Center, Texas A&M Texarkana, Texarkana College, and various other governments and agencies. The TexAmericas center is a win- win for all concerned. We are poised well for the next BRAC (if there is one). We are also prepared to meet the needs of the next business wanting to locate on this site and needing trained employees and to train government workers on the latest methods and techniques to improve quality and efficiency and to provide a safer workplace. The challenges are still there. This is a huge investment by Texarkana College and is not yet making a profit which is currently the most challenging part of this venture. The training provide by the TexAmericas Center is the spark needed to encourage innovation and new business along with keeping an existing entity (Red River Army Depot) operating efficiently. The challenge is finding funding when everyone is facing a shrinking budget to adequately fund workforce development. Everyone knows training is the key to future success, but it is hard to spend money in these times. We feel like this will be a bragging point in the very near future and a model for a successful partnership between education, industry, and government.

Q3. Beyond teacher training, please expand on what your institution is contributing to K–12 education, particularly to middle school youth. Does your institution provide faculty and students as mentors to local classrooms?

A3. Texarkana College is providing low cost dual credit opportunities throughout our entire 1,800 square mile service area in north east Texas. The cost for a three hour college class is roughly $85.00. A typical student can easily graduate from high school with twenty to thirty hours of college credit for as low as $1,700 to $2,550

of an investment by the family. Anyone that has a student off at college can quickly do the math and see that the family has saved thousands of dollars in tuitions, fees, room and board by the efficient dual credit opportunities that are available. Texarkana College partners with local PK–12 institutions to start at a young age establishing the realization that a college education is much more than a dream. It is a reality. While Texarkana Colleges reaches out to students in middle school through programs such as the Federal Trio, we actually believe that you must start even younger. We host events at the Texarkana College that bring elementary, middle, and high school students to the campus. We go to these campuses for various visits and motivational talks. We emphasize that what a student does when they are in any grade has an impact on what they will be doing when they are twenty five years old. We firmly believe that it is critical for a young person to establish the belief and hope at a very young age that they will one day be a college graduate. Once a child has that vision and that hope, we believe the greatest obstacle has been overcome. The Kids at Hope National Model is a great one for working with youth to establish that vision of the future. In this model, a youth at an early age will establish measurable goals in the area of Education and Career, Home and Family, Community Service, and Hobbies/Recreation. Once those positive mental images are put in place at an early age, it is hard for anyone to ever remove them. I am a firm believer that the greatest thing a student needs in our country today is HOPE for a bright future. Once they have that there are plenty of opportunities available to make it happen.

Dr. Brad Johnson, President, Northeast Texas Community College

Questions submitted by Chairman Ralph Hall

Q1. How do both two-year and four-year institutions cope with the fast-paced changes in modern technological advances and the specialized requirements for many 21st century technical jobs when it comes to keeping the curriculum current to meet the needs of employers?

A1. We depend on the cooperation of business and industry through various means. The most localized is the use of advisory committees. These teams are made up of local private business Members who typically employ persons with the skills we are training. These individuals keep us informed about their needs, new technologies they are adopting, and the appropriate standards of learning needed to deliver trained individuals to their workforce.

We also depend heavily on national industry groups which often validate the particular skills associated with various programs of study. Sometimes these groups actually accredit our programs by examining our curriculum and the learning outcomes of students, and then granting us the right to use their external validation in our recruitment efforts. Other times the industry groups simply provide information and we are responsible for meeting those standards voluntarily.

Q2. Which partnerships that you have established with local, regional, state, federal government and non-government entities have proved to be the most challenging to form? Why were they challenging, and how were you able to overcome them?

A2. Multi-institutional collaborations have proven most difficult recently. While all public institutions are eager to work together in principle, the local political realities often create competition which most of our college leadership in East Texas have not learned how to completely overcome. When combined with the frequent appearance of other challenges which distract from a multi-college collaboration, it results in the belief on the part of many that the extra effort required to make such collaborations work is simply not worth the headaches.

I would say we have not yet overcome many of these challenges. Our own collaboration with Texas A&M University—Texarkana is one major exception to my comments here. That partnership has resulted in a University Center on the campus of Northeast Texas Community College which delivers baccalaureate degrees to our local community, more than one hour from the TAMU–T main campus.

I would have to say the reasons this one works include 1)TAMU–T has stationed full time staff on our campus who live locally and are highly motivated to keep the programs viable; 2) university leadership has chosen to make the project a priority and so is personally involved; and 3) my college has no desire to offer baccalaureate degrees ourselves, but believe strongly that access to such degree options are part of our mission. So all of us work hard to make it succeed.

Q3. Beyond teacher training, please expand on what your institution is contributing to K–12 education, particularly related to middle school youth. Does your institution provide faculty and students as mentors to local classrooms?

A3. We do not have a program for this purpose per se. However, we share instructors and other staff with the TAMU–T Education program to meet the needs in our local area for teacher training.

NTCC does provide a large number of "pipeline" activities to students as young as elementary school which are designed to raise the awareness of parents and children of the need to go to college and of the preparation in Junior High and High School needed to be successful in college. Examples of these activities include campus visits for college activities like theatre productions, guest speakers, campus tours, and visits to particular programs like Dental Hygiene or Welding. The college also has a program in partnership with all 11 of our regional ISDs in which each graduating high school senior is mentored through the college admission process, assisted with selection of a college major, and all other necessary steps. The result is that every graduating senior in our region has been admitted to college and has a "post-high school" plan.

Q4. Please expand on the SMART (Science, Math, and Related Technologies) Girls and the WISE (Working in Science and Engineering) Guys programs.

A4. These programs are targeted to at-risk young people and designed to raise their interest in science and math careers, as well as other careers which might go unnoticed by the typical boy or girl. Students participate in various activities (for exam-

ple, robotics contests) which demonstrate the practical uses of math and science, as well as providing exposure to people who work in these career areas.

Q5. Please explain the award winning "Regional Advanced Manufacturing Academy". What return on investment are you expecting to achieve in the number of new jobs andadditional income for the community.

A5. This program, known locally as "RAMA," brought together the training capabilities of three regional community colleges—Texarkana College, Paris Junior College, and Northeast Texas Community College, as well as the financial and logistical assistance of Workforce Solutions of Northeast Texas. The program was built on the training needs requested by the region's largest industrial employers and served incumbent workers, as well as persons seeking entry into this field.

When an employer had a need, they requested the training, assisted in determining the particular curriculum they wanted, and released their employees to participate in the training. Areas of training expertise were divided among the 3 colleges and the courses were delivered by which ever college was most well-equipped/staffed in that subject area. This meant that the training delivered to a company in one college's service area might be delivered by a different college.

The strategy worked quite well from the perspective of business and industry. The employer feedback was strongly positive. However, the sudden and precipitous economic downturn resulted in area industries reducing their workforce dramatically. Those remaining on the job were working much overtime and the companies were reluctant to release workers from the job to take training. So when the term of the initial project was completed, the project was suspended for the time being.

All three colleges have indicated our interest in reestablishing this model, with some modifications, when industry indicates they are again able to make employees available for training.

Q6. Please describe any challenges or particular successes you have encountered in dealingwith Federal dollars allocated through grants for your institution.

A6. First, let me say that our college is grateful for the federal grant support we have received in the past, both through direct grants, as well as money flowing through the State of Texas (Texas Workforce Commission, etc.). These funds have certainly gone to worthy projects and have improved the lives of our region's citizenry.

However, since you ask, I must acknowledge that the bureaucratic burden that comes with federal grants (and to a lesser degree, state grants) often saps much-needed funds and reduces their impact. Specifically, the rules are usually quite inflexible. But the reality on the ground is quite fluid and requires a high-degree of flexibility in today's economic environment. We often find that federal program directors do not understand our business, thus we live with rules that are irrelevant or even silly, when compared to the intended purpose of the grants.

And lastly, the "accountability" that is required of us often amounts to "busy work" rather than actually assuring the public that the intended purpose of the grant is accomplished. Sometimes we already have accountability requirements from another federal agency or from the State of Texas which assure the public we are maintaining fiscal integrity. But the federal accountability method will differ enough to necessitate a second administrative report.

So the reality on the ground is that every programmatic dollar (money actually spent delivering the educational purpose) ends up costing $6 dollars (after the federal bureaucracy takes its cut and I have to pay staff at the college to track a seemingly endless sets of data). The federal government would get far more for the same investment if it simply gave the money directly to the colleges, and required a particular outcome ("Here's $50,000—produce 20 certified electricians ").

Using Electrical Trades as an example, consider this:

- To have a program in electrical trades we have already met the State of Texas' standards and the program curriculum has been approved;
- To keep the program open we are already required to track our graduates and assure they get jobs in the fields they trained for;
- To keep our institutional accreditation, we are already required to prove our instructors are appropriately trained/educated;
- To participate in federal financial aid, we must already prove that our students are making satisfactory progress toward their educational goals;
- And annually, we are required to have an independent audit to assure that we spent money in legally stipulated ways—in other words, that we did what we agreed to do when we accepted the funds.

Why must we prove many of these things (and much more) to the federal government—again—and in slightly different ways? The differences in oversight requirements are important because they mean we must go through the entire reporting process as if we hadn't already done it for the state or the Dept. of Education. So the resulting growth in administrative staff adds cost, slows our responsiveness, and limits resources that could be put into the classroom.

In closing, our task is so important to the long-term economic viability of our nation, and local resources are so hard to come by, that we will continue to be grateful for any federal assistance we can receive. These comments are only an observation "on the ground" of the fact that federally-administered programs are a particularly expensive way to get things done.

Dr. C. B. Rathburn, III, President, Texas A&M University–Texarkana

Questions submitted by Chairman Ralph Hall

Q1. How do both two-year and four-year institutions cope with the fast paced changes in modern technological advances and the specialized requirements for many 21st century technical jobs when it comes to keeping the curriculum current to meet the needs of employers?

A1. This is a major challenge for higher education in terms of cost for the acquisition and maintenance of the technologies as well as the cost of training and retraining faculty and staff to make effective utilization of these resources. The disconnection between academia and the workplace is a major concern especially as it relates to the utilization of various technologies. In academia we are too often forced to "demonstrate" the technology as opposed to really training the student use these technologies in a productive environment. The answer is a simple one—expand and incent higher education, the student and the employer to expand cooperative education and internship opportunities. Through these opportunities the students are afforded the opportunity to work in real time and real production with the current technologies of the chosen profession.

In addition to providing access to the current technologies of the field, internship and cooperative education opportunities provide a direct link for academia from a curricular perspective to the demands of today's employers. This link is critical in insuring that the proper input is acquired and utilized from the employers to mold and guide curricular decisions. Neither academia nor the workplace should dictate curriculum as each party has their own unique and valuable role. Academia should push the employers to explore new uses of technology and new methods of operation that can lead to enhanced quality and productivity. The employers should push academia to demonstrate, evaluate and guarantee that the graduates completing a degree have the required knowledge, skills, abilities and soft skills to immediately provide value to the workplace.

At Texas A&M University–Texarkana we are proud of the involvement and impact of our curriculum advisory committees including our overall Business Advisory Committee. Leaders from the regional business community give of their time and expertise to annually advise the university on our program offering, curriculum alignment as well as the quality of our graduates in the workplace. This counsel is critical to the success and growth of the university and the future success of our students.

Q2. Which Partnerships that you have established with local, state, regional, federal government and non-government entities have proved to be the most challenging to form? Why were they challenging and how were you able to overcome them?

A2. Educational partnerships across state lines have become much more difficult to develop and maintain in recent years. Texas A&M University-Texarkana is located in a bi-state community with the state lines of three other states within 50 miles. Due to the lack of national accreditation and certification criteria we have found it difficult to meet the needs of the students and prospective employers simultaneously.

No field is this more challenging than public education. Variance in teacher certification requirements across state lines has made the operation of teacher education programs extremely challenging when you have students planning to teach in a variety of states. Recently the state of Arkansas overhauled their requirements for principal and superintendent certifications and removed the reciprocal arrangement with Texas to recognize certification from another state. This means a student who completes our administrative certifications at Texas A&M University–Texarkana cannot be employed in the Texarkana, Arkansas school district five miles to the east. The lack of national reciprocity in teacher and administrative certification as we find in medicine and engineering will have a profound negative impact on both universities and school districts.

This "state to state" competition is present in a number of fields. To address this challenge the university proposed a plan to create a crosswalk based on curricular alignment between the two state administrative certification requirements and then provide additional course work necessary to address the gaps in the alignment. While this plan is in the discussion stages we are optimistic of success.

Q3. Beyond teacher training, please expand on what your institution is contributing to K–12 education, particularly related to middle school youth. Does your institution provide faculty and students as mentors to local classrooms?

A3. Though programs such as Club 21:11, the university is engaged in a variety of stay in school efforts at the middle school level that focus on addressing the organization, motivation and character building aspects of middle school education. Although not in middle school, our Professional Development School operated at Westlawn Elementary School is a prime example of the integration of higher education and public education. Our master teacher students along with full time university professors are assigned to this school on a daily basis. The university professor supervises the master teacher students who have full time classroom assignments in a yearlong "medical model" teacher certification effort similar to a residency. The master teachers gain valuable classroom effectiveness skills while the students benefit from state of the art curriculum and classroom instructional strategies. In the end we gain a better prepared teacher and a better equipped and motivated student. At present we are exploring the possibility of transiting this model of master teacher training to the middle school STEM academy as well as the Perot STEM Academy at Texas High School.

Q4. Please expand on the Texas Middle School STEM Academy

A4. The Middle School STEM academy is the logical extension of the well recognized and very successful Martha and Josh Morris Engineering and Mathematics magnet school. The middle school STEM academy continues the educational philosophy of an entire comprehensive curriculum taught in the language of engineering and math. The middle school STEM academy articulates the elementary programs at the Morris school into the Perot STEM academy at Texas High School and the STEM College at Texas A&M University–Texarkana to produce a world class Pre-K through baccalaureate degree vertically aligned STEM curricular program.

Ms. Pam Kennedy, Vice President of Human Resources, CHRISTUS St. Michael health System

Questions submitted by Chairman Ralph Hall

Q1. 1.What percentage of your workforce is being provided by the local colleges?

A1. Approximately 40%, including ADN nurses (2 year).

Q2. What is the average length of employment for your locally educated workforce verses those you have to recruit from outside the community?

A2. Approximately ten years plus or minus, compared to 2–5 years of those whom we recruit outside of the community. I attribute it is much longer because of the associate's family ties within the community.

Q3. If not for the local workforce being supplied by the community colleges and the close proximity of Texas A&M–Texarkana, would CHRISTUS St. Michael still be operating in Texarkana?

A3. Yes, I strongly believe we would still be operating in Texarkana, but recruitment would be much more challenging and costly to recruit from outside of our community if we did not have local colleges and Texas A & M–Texarkana.

Q4. For your organization, would you believe that you have job opportunities available, but no talent to fill them, or a combination of both?

A4. Normally, the challenge of recruiting hard-to-fill positions is because of the needed experience from comparable organizations for administrative level type positions. However, there are technical/medical positions such as Physicist, Dosimetrist, and IT specific positions that require a higher level STEM type education that we have only begun to focus on within the last few years in our community.

Q5. What do we as a Nation need to do to solve this problem?

A5. Mandate educational opportunities for STEM in the early, formative years to instill the importance of the future demands. By mandating, we as a Nation will need to provide funding to ensure this is accomplished.

Q6. Please expand on CHRISTUS St. Michael's job shadowing program for local high schools.

A6. The increase in healthcare opportunities combined with the decreasing number of individuals pursuing careers in healthcare, has led to staffing shortages in many areas, including Nursing, Therapy, and Laboratory. In an effort to encourage High School and College students to enter healthcare, CHRISTUS St. Michael established a Career Exploration—Job Shadowing Mentorship Program. The program design started in July 2008, and kicked off in January 2009. The program was established to provide an opportunity for participants to explore, with first hand observation, the area(s) in which they have an interest. The goal is to encourage individuals to not only enter the healthcare industry, but to also assist them in choosing which area they want to pursue, if they have not already decided. To date there have been approximately 250 participants, that have shadowed in various areas, including, Women's & Children's, Radiology, Laboratory, Respiratory, and Physical Therapy to name a few.

The long-term goal of the Career Exploration/Job Shadowing Mentorship Program is to add value to our community with regard to addressing future healthcare needs and employment, particularly those where we are experiencing staffing shortages. Through Service Excellence and Stewardship the program plants the seeds with High School and College students, tomorrow's workforce, with minimal local resources. Our goal is to "grow our own," to reinforce the CHRISTUS Health Mission and Vision, and to extend the healing ministry of Jesus Christ, throughout the Ark-La-Tex region by providing these young students with a meaningful experience. We want to share not only with patients and visitors, but with other Members of the community and surrounding areas the incredible, deep rooted, culture that CHRISTUS St. Michael has. It also allows them the opportunity to experience first-hand why we have been chosen as one of the Best Places to Work in Texas five years in a row (ranking #6 in large industries in 2010), #3 in the nation by Modern Healthcare Top 100 Best Companies to Work in Healthcare, and most recently Becker's Review Top 100 Best Places to Work in Healthcare!

According to Forbes, Texarkana is predicted to increase 28.57% in GMP by 2012 making Texarkana the second fastest growing small metro area in the country. To

meet the service and employment needs of the community, and to ensure that CHRISTUS St. Michael can continue to offer a substantial line of current and future services, the Career Exploration/Job Shadowing Mentorship Program was developed and implemented to meet these needs through "planting the seeds" of the future workforce early on. To date, CHRISTUS St. Michael has partnered with three local High Schools, and several Colleges and Universities within a 300 mile radius to work with students that are either enrolled or in the application process to participate in healthcare programs.

As a means to enhance the program, CHRISTUS St. Michael has offered an on-site Career Fair the past four years for area students. The first year, five High Schools attended (170 students) and approximately twenty-one departments within CHRISTUS St. Michael participated. To expand on this, in February 2010 a second Career Fair was held and a total of twelve High Schools attended (450 students), nineteen departments and one College participated. In 2011, we expanded the program exponentially. These events give us an opportunity for the students to experience our facility and to educate them about the variety of healthcare occupations that exist. There is also an opportunity to educate them on our benefits, general salary information, and tuition reimbursement and/or scholarship opportunities. The feedback has been extremely positive and many students have expressed an interest in returning to CHRISTUS St. Michael for employment opportunities.

Q7. What other opportunities does CHRISTUS offer for young students? Are they mostly geared toward high school students, or do you also work with elementary and middle school youth?

A7. Another enhancement to the program is our involvement in the local Junior Achievement program. Our Human Resources Recruiter was elected to their Board last summer and has been actively involved in the programs offered by Junior Achievement to 2nd and 8th graders at local elementary and middle schools in our area. The program lasts for a total of five weeks (one visit per week) and the topic is "How does a Community work?" It covers what some of the different businesses are that exist in a community, and we discuss the needs and services they provide and why they are important. The classes also cover how to manufacture a product, and how money flows within a community. This exposure also gives them an opportunity to meet someone from CHRISTUS St. Michael to begin "growing our own" early!

Mr. Myron Barnett, Human Resource Manager, International Paper

Questions submitted by Chairman Ralph Hall

Q1. What percentage of your workforce is being provided by the local colleges?

A1. Less than 5%

Q2. What is the average length of employment for your locally educated workforce versus those you have to recruit from outside of the community?

A2. Don't have this data

Q3. If not for the local workforce being supplied by the community colleges and the close proximity of Texas A&M Texarkana, would IP still be operating in Texarkana?

A3. Yes

Q4. For your organization would you believe that you have job opportunities available, but no talent to fill them, or a combination of both?

A4. We have a number of positions open, but must search outside the Texarkana area to fill a number of production and maintenance jobs due to the lack of qualified candidates in the area.

Q5. What do we as a nation need to do to solve this problem?

A5. Put a strong focus on STEM education beginning with our primary aged children and continuing through High School.

Q6. Do you find that the difficulty IP is having with recruiting local employees to fill the production and maintenance side of your company, which requires computer and technical skills, is due to the fact that there are not enough graduates to fill your positions or is it that local schools are not providing the types of employee specific needs of the Texarkana Mill? If the latter, what efforts is IP taking to rectify this problem?

A6. At this time, we see that there aren't enough graduates to fill a number of the positions open at the mill. Currently, we are working on a partnership with Texarkana College and have begun funding STEM education programs through our foundation dollars.

Mr. Denis Washington, Chairman, TexAmericas

Questions submitted by Chairman Ralph Hall

1. Please expand on your PK-16 Stem Education Initiative, and why TexAmericas deems it important to begin with our children and grandchildren before they go to college or enter the workforce.

   RESPONSE: It is apparent to TexAmericas and our Educators that children are able to expand their educational horizon with hands-on experiences. Practical application of their classroom studies and curriculum through research, internship and summer job programs brings to life these theories, procedures and methods. The learning process varies among students, and the value to the theories become more accepted once the reason why is brought to light. Students are able absorb the information. It also gives these students a fresh look at their prospective career path, and determines whether their choice is a match for their individual drive and motivation.

2. What role do the local academic institutions play in TexAmericas ability to attract the 13 non-federal companies you host and the 12 prospective businesses that you have expressed an interest in relocating or establishing their operations in Texarkana?

   RESPONSE: Texarkana business community realizes that it requires a joint effort from all sectors to attract prospective businesses to the region. Local school districts have invested millions of dollars to enhance its facilities and expand its curriculum in recent years to remain competitive in producing a valued product. Their investment helps to ensure that this product chance of being successful in college is further enhanced. Dual credit courses are offered by the colleges to advance the studies for college bound students, which helps to reduce college tuition costs while expediting their degree programs. Our School Districts performance ratings make it attractive for potential businesses to know the quality education their children

will be obtaining in this community. The presence of a community college and a university adds support for continuing education and job training for a prospective business' staff and workforce. Both the Texas Economic Development Agency and Texas A&M University System's Center for Emerging Technology and Economic Development have produced business leads that TexAmericas has either solicited and were solicited by the prospect.

3. For your organization would you believe that you have job opportunities available, but no talent to fill them, or a combination of both? What do we as a nation need to do to solve this problem.

RESPONSE: TexAmericas has been successful in attracting the required talent for our team. Our mission continues to change and grow with the needs of the Army along with the disposal of excess military properties. Job opportunities are created by our organization as our mission has increased over the years. Our various cost centers, i.e. accounting, forestry, property management, and utilities have been created out of necessity to ensure that the respective areas and its resources are capably managed. We must safeguard our assets, but increase its usefulness and service for the good of the community. TAC's initial concept has been to outsource various services until the need for in-house managed services can be justified. Our pool of applications is derived from both local applicants as well as national searches as it was in the case of our present CEO. I believe that our tenants and business operators have the biggest challenge in attracting and retaining a reliable workforce. They have created a substantial amount of the 800+ jobs that now exist on the properties of TAC. It is believed that many of the job losses in our country from the past few years may never return. Many positions have either migrated elsewhere, foreign and domestic, or were replaced with technological advances/processes. I believe that many will need to be retrained for jobs that have yet to be defined or created. Workforce development will be critical to re-engage those displaced workers and servicemen returning from duty. Vocational programs in our schools should be revitalized to prepare those students that may not be college bound to develop a trade or skill that will sustain them for years to come.

Reported continued downsizing of the military/reductions in force will place more potential workers in need of training for employment opportunities. A greater emphasis on workforce training to ensure a well-trained and work-ready population will be necessary for business to be productive and profitable when their business cycle launches.

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