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University Transportation Center for Mobility

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Facilitating Outreach Programs for Students in Rural Texas

Final Report

Debbie Jasek

Performing Organization

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Texas Transportation Institute
The Texas A&M University System
College Station, TX

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16. Abstract <p>Since 1998, the Texas Transportation Institute (TTI) has expanded its efforts to build dynamic partnerships among the business, industry, and education sectors. Previous grants from the Southwest University Transportation Center (SWUTC) created pilot programs targeting minority populations in southern and coastal Texas. This current project strives to create long-term outreach programs to students in rural Texas built on these previous efforts. A number of the pilot programs are evolving into active programs funded by other public and private monies. These programs include an Industry to Work Day, participation in career fairs, teachers' workshops, <i>colonias</i> outreach, and assistance with the South Texas Summer Transportation Institute. In order for these programs to be successful, TTI needs to remain an active program partner. This project provided TTI team members with the opportunity to act as facilitators for two years to ensure program success.</p>					
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FACILITATING OUTREACH PROGRAMS FOR STUDENTS IN RURAL TEXAS

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EXECUTIVE SUMMARY

Some Texas students, especially those from rural areas, are not afforded the same access to outreach programs that are available in large metropolitan areas. Rural students in Texas are less likely to pursue higher education than their urban counterparts. Motivations for students to attend college include supportive influence from parents and peers, accurate value assessment of higher education, high school activity, and socioeconomic/demographic factors. These factors are often missing for rural students. The following strategies encourage students to attend college: exposure to college atmosphere, college information, mentoring, exposure to role models, and information to promote career assessment. It is crucial that rural Texas students are exposed to outreach that will encourage them to expect to go to college.

Previous grants from the Southwest University Transportation Center (SWUTC) and other sources piloted a number of outreach programs targeting minority and rural populations in southern and coastal Texas. Some of the events created by these projects were championed by other agencies and non-profit organizations and are evolving into perennial programs. The purpose of this project was to facilitate the progression of these events as they develop by assisting the sponsoring agencies through the first two years. By providing consistent outreach strategies to rural students that emphasize science, technology, engineering, and mathematics (STEM) and introducing them to transportation opportunities and careers, this project encourages students to attend college.

This project allowed outreach team members to participate in a variety of outreach events around Texas. These events included an Industry to Work Day, career fairs, teacher workshops and conferences, a special *colonias* outreach facilitation, and assistance with the South Texas Summer Transportation Institute. In order for these programs to be successful, the Texas Transportation Institute (TTI) needs to remain an active program partner. This project provided TTI team members with the opportunity to act as facilitators for two years to ensure program success.

1.0 INTRODUCTION

1.1 BACKGROUND

Some Texas students, especially those from rural areas, are not afforded the same access to outreach programs that are available in large metropolitan areas. Statewide in 2005 and 2006, approximately 20 percent of Texas public school graduates enrolled in Texas public universities. However, in rural counties that number ranged from percent 4 to 10 percent, and in south Texas where *colonias* are prevalent, the number was much lower.¹

Thus, rural students in Texas are less likely to pursue higher education than their urban counterparts. Motivations for students to attend college include supportive influence from parents and peers, accurate value assessment of higher education, high school activity, and socioeconomic/demographic factors. These factors are often missing for rural students. The following strategies encourage students to attend college: exposure to college atmosphere, college information, mentoring, exposure to role models, and information to promote career assessment. It is crucial that rural Texas students are exposed to outreach that will encourage them to expect to go to college.

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1.2 OBJECTIVES

The main objective of this project was to facilitate outreach strategies to students that emphasize STEM and introduce them to career opportunities in transportation. The primary target audiences for the project were students in rural Texas and schools with disproportionate numbers of minority students.

A secondary objective was to facilitate the continued use of events (developed through previous grants from SWUTC) by other agencies and organizations.

2.0 INDUSTRY GOES TO SCHOOL

2.1 BACKGROUND

Industry Goes to School began as a part of the SWUTC project entitled *On the Move!*² When the project team hosted an On the Move! event at Tidehaven Independent School District (ISD), the high school principal suggested meeting with the education program manager for the Gulf of Mexico Foundation (GMF) in Port Aransas, who was interested in hosting a similar event. After meeting with the GMF educational program manager, it was decided that the On the Move! event would become a part of a larger weeklong event known as EcoEco Week.

EcoEco Week consists of a series of events for junior high and high school students that reside in coastal counties. The events introduce them to the importance of the Gulf of Mexico ecology and local industry to their lives. It also emphasizes personal and corporate obligations to both the community and environment. The event includes field trips to local industry, meetings with community leaders, a beach cleanup, and a career exploration day.

The career exploration day, which developed into Industry Goes to School, shines the spotlight on industries, companies, and agencies whose work requires a firm STEM grounding. All of the corporate partners contacted for participation are located in the host school's county or adjacent counties. Often other schools in the county or adjacent school districts are invited to participate in the career exploration day as well.

The corporate partners are invited to the school to set up booths and exhibits that show how math and science are used in the real world to make a difference and help answer the age-old question, "Why do I need to learn this?" Keeping the focus on local corporate partners familiarized students with industry, and in some instances the participating personnel included parents and relatives. As one student remarked, "Before today, I did not understand what my uncle did!"

2.2 EVENT FACILITATION

After the SWUTC project was completed, the Gulf of Mexico Foundation decided to apply for a grant to continue the event as part of its outreach program in various schools. The grant from the Texas Land Commission provided funds for three events. This project allowed the Texas Transportation Institute (TTI) representative to facilitate the development of the program and participate in the first year of the program launch. The school locations selected for the event were Port Lavaca High School in Calhoun County, Aransas Pass High School in San Patricio County, and Edna Elementary in Jackson County.

The first program was held at Port Lavaca high school and was structured as an Industry Goes to School Day as developed during the On the Move! SWUTC project. Fifteen companies and agencies spent the day with students at the high school. The program

focused on how math and science are used in the real world and on engineering as a career path. Students toured the booths and talked to industry representatives as depicted in Figure 1. Approximately 375 students attended the event.



Figure 1. Students at Port Lavaca Event.

The second program was held at Aransas Pass High School and was also structured as an Industry Goes to School Day. Fourteen companies and agencies spent the day with students at the high school. In addition to the corporate participation of the day, local politicians and business leaders, including the mayor, members of the city council, and members of the chamber of commerce, had lunch with student leaders and talked about the local economy and outlook for industry development in the area. Other local schools attending the event included Port Aransas High School, Taft High School, and Sinton High School. Approximately 590 students attended the event.

The third program was held at Edna Middle School. This program was an evening with math, science, engineering, and art. Twelve companies and agencies and four artists participated in demonstrations and activities concerning math and science for elementary and middle school children and their parents. One interesting aspect of this program was the incorporation of artists and their demonstrations of how math, engineering, and science are used to create art. The art featured included stained glass, bronze sculptures, laser sculptures, dimensional painting, and computer-generated art. Approximately 200 students and 450 parents and family members attended the four-hour event.

2.3 PROJECT ASSESSMENT AND LEVERAGING

As previously stated, a total of 1,165 students participated in the first year of the Industry Goes to School program. This number does not include parents and family members that attended the evening event in Jackson County.

This event proves to be a very popular program. The after-action responses from corporate participants, schools, and students were extremely positive. Student remarks included surprise at the level of mathematics and science that were required for everyday businesses, and excitement about being able to explore new career opportunities at local industries. Local industry participants enjoyed the event and felt it allowed them to connect with members of the future workforce in a positive manner.

The estimated leverage from the grant obtained by the Gulf of Mexico Foundation from the Texas Land Commission and from corporate participation in the programs was \$24,000. This leverage was in the form of salaries for team members, travel, and supplies.

3.0 COLONIAS OUTREACH

3.1 BACKGROUND

The second portion of this project focused on children living in the Laredo *colonias*. The Spanish term *colonia* refers to a neighborhood or community; in the United States it refers to an unincorporated settlement along the U.S.-Mexico border. Currently, there are believed to be approximately 400,000 people located in Texas' 1,400 *colonias*, which span the 1,248-mile border. Education of *colonias* residents and their children is a major issue. The dropout rate for children in *colonias* is excessive, with some estimates as high as 90 percent.

3.2 EVENT FACILITATION

The team helped to facilitate a partnership between staff at the South Texas Imaginarium, which is a children's museum in Laredo, and the Texas A&M Center for Housing and Urban Development (CHUD). As a result of this collaboration, the Imaginarium staff visited each community center every six weeks during the summer of 2010 to bring a mobile program to children of the *colonias*. This program emphasized science, technology, engineering, and math.

3.3 PROJECT ASSESSMENT

The number of children served varies by visit of the mobile unit. An average visit as reported by CHUD staff has 10 to 15 students participating in activities. During the first summer, the mobile unit made two visits to each of three community centers.

4.0 CAREER FAIR OUTREACH

4.1 BACKGROUND

Career fairs are an innovative way to project a message to a large number of students in a single setting. Traditionally career fairs have been hosted by a school or school district for the benefit of the students at that particular school. In recent years some areas have begun hosting larger fairs that are held in facilities such as exposition centers or convention centers.

These new-style fairs are typically hosted by the chamber of commerce, local professional organizations, or a consortium of school districts. This allows corporate backing of the fair, which eases the burden on schools. Multiple school districts are able to participate, and industry is able to broaden their presentation. The program may involve a more hands-on, browse format for specific career disciplines in which actual instructors—business or industry personnel—present demonstrations on what their industry does and the careers available in that industry. The goal is to provide a more comprehensive overview of the required course work and future career opportunities. Presenters who bring actual equipment and resources to demonstrate are extremely successful in attracting students to their program. In this format the fair resembles the Industry Goes to School Day on a much larger scale.

4.2 EVENT FACILITATION

The TTI outreach team was able to attend a number of career fairs as a result of this project. The team attended the South Texas Career Fair and Science Exposition in 2009 and 2010. This annual event held in March is sponsored by Riviera ISD and is held at the Kingsville Convention Center. The fair has more than 100 booths set up for the fair, and 29 schools from across south Texas and the Rio Grande Valley region brought more than 3,100 students to the fair in 2009 and 2,675 students in 2010. The TTI booth was the only booth covering transportation careers.

The Brazos Valley Chamber of Commerce began a Brazos Valley Career Fair in 2009. This project funded the TTI outreach team's efforts to develop a display and coordinate TTI members for this fair. The TTI booth as shown in Figure 2 was manned by twelve TTI researchers and staff members. The fair, which was hosted at the Brazos County Expo Center, was attended by approximately 2,500 students from school districts in

seven counties of the Brazos Valley region. TTI also participated in the career fair in 2010, where about 2,300 students attended.



Figure 2. 2009 Brazos Valley Career Fair.

In August 2010, engineers for the City of Waco began to organize an Engineering Career Fair for Waco. The fair was held in October 2010. TTI was able to send two representatives to man a booth because of funding from this project. Students attending the fair were from Waco-area schools grades 4-8.

Approximately 800 students from the Waco area attended the program, which was well received. The following excerpt from a thank-you note from a teacher at Robinson High School sums up this event:

This is the first year that Robinson has offered Engineering Math. The district spent a lot of money on the ten students willing to try out the new course. I was very pleased with the results of Waco Engineering Day! I know these senior boys were not expecting much. They thought it too childish to go on a field trip. They thought it was “uncool” to attend an engineering conference. When we arrived at the convention center, I asked the students to try to have a positive attitude and encouraged them to find at least one thing positive to say about their visit when it was over. I made arrangements with them to meet up earlier than we needed to for fear that they would be bored and ready to leave.

The process and event were better than expected! The students thoroughly enjoyed themselves. The hands-on participation with most booths provided interest to them. I was pleased to see them interact with the adults from the various workplaces. The engineers showed an interest in my students and what my students were learning at school. There were some who asked my students what our class was about. At our designated meeting time they spoke of their amazement. When I said we could spend about 30 more minutes if they wanted, it was an overwhelming yes!

4.3 PROJECT ASSESSMENT

Funding from this project allowed the TTI outreach team to participate in five career fairs in three separate regions of Texas. These fairs served as a conduit to introduce transportation careers to a large number of students at minimal cost. Approximately 11,465 students attended the career fairs and viewed the TTI displays. Many of them interacted with members of the TTI outreach team and TTI transportation professionals. Although the interactions were brief, students were introduced to possibilities of careers in transportation and given materials that provide more details on transportation.

5.0 TEACHER WORKSHOPS

5.1 BACKGROUND

Many of the previous grants for transportation outreach resulted in a variety of materials that are suitable for use in the classroom. These materials teach STEM concepts and have a transportation component. A large number of similar activities, teaching modules, and classroom aides have been developed by various professional organizations, higher education groups, and private industry and are available on the web to teachers. In a previous project, SWUTC funded the development and launch of a website that allows teachers to access current materials and activities developed by TTI and other agencies. The remaining challenge is making teachers aware of these materials and how they can be incorporated into classroom subject matter. One way to accomplish this is to attend teacher conferences and workshops.

5.2 EVENT FACILITATION

TTI members attended three teacher conferences and workshops as a result of this project. In April 2010, the project team attended a professional development workshop for College Station Advancement Via Individual Determination (AVID) teachers. The AVID program targets students in the academic middle—B, C, and even D students—who have the desire to go to college and the willingness to work hard. The program places academically average students in advanced classes and provides them with an elective class that prepares them to succeed in rigorous curricula, enter mainstream activities in school, and increase their opportunities to enroll in four-year colleges. Team members presented information on STEM materials available to teachers for use in the

classroom and provided contact information for speakers for the classroom. Ten teachers attended the workshop.

In November 2010, team members were invited to present at the Texas Art Teachers Conference in Austin. During the workshop TTI team members presented activities and tips on how to introduce math and science skills into art curricula. This included tips on basic structures, geometry, and how mathematic series such as the Fibonacci series bridge the gap between math, engineering, and art. Although this presentation was not a strictly transportation-related activity, the conference offered a forum to expand STEM skills (which are crucial to transportation) for a wider audience. More than 220 handouts and cards were passed out to teachers from all over Texas during the workshop.

In February 2011, team members were asked to participate in a transportation careers panel for the Texas Gulf Coast Tech Prep Extravaganza for High School Counselors and Administrators in Houston. More than 250 high school principals, administrators, and counselors attended the conference, and approximately 75 attended the transportation careers panel.

5.3 PROJECT ASSESSMENT

Although teacher workshops do not allow direct contact with students, they do offer an opportunity to present concepts, information, activities, and materials that can be incorporated into the curricula. At the three teacher workshops, contact was made with several hundred teachers from numerous school districts throughout the region and state. As a result of this contact, the TTI outreach team has been contacted about attending future career fairs in Klein and Conroe. Three school districts requested generic transportation careers materials for their career center.

6.0 SUMMER TRANSPORTATION INSTITUTE

6.1 BACKGROUND

The National Summer Transportation Institute (NSTI) is an educational program that was created to support the Garrett A. Morgan Technology and Transportation Futures Program. The Garrett A. Morgan Technology and Transportation Futures Program was a U.S. Department of Transportation educational initiative to reach and challenge 1 million students of all ages. The goal was to focus on their math, science, and technology skills so that they were prepared to become the transportation workforce of the 21st century. Initial institutes and NSTI host sites included Historically Black Colleges and Universities (HBCUs) and other Minority Institutions of Higher Education (MIHEs) across the nation.

TTI has developed and presented NSTI-sponsored summer programs since 1999. In 1999, the first year for the Texas program, institutes were held in Houston and Dallas. As the program has expanded, the partnerships with universities around the state have

grown to include Texas A&M University–Kingsville, Paul Quinn College, Prairie View A&M University, Palo Alto College, The University of Texas at El Paso, and Texas Southern University. The number of programs conducted each year directly relates to funds available.

In 2010, TTI was informed that funding for the institute was not available for the programs at Texas A&M University–Kingsville and Prairie View A&M University (PVAMU). It was decided that a modified version of the program should be conducted if at all possible to ensure continuity of the program. SWUTC was contacted regarding the funding situation and graciously awarded the program a small grant of \$2,910 to cover expenses related to conducting the program. Additional funding sources included TTI, the University Transportation Center for Mobility (UTCM), the Roy G. Perry College of Engineering at Prairie View A&M University, and the Frank H. Dotterweich College of Engineering at Texas A&M University–Kingsville.

6.2 EVENT FACILITATION

Prairie View A&M University

The PVAMU program was held from June 21 through July 2, 2010. Seventeen students attended the summer program. The bulk of the funding for the PVAMU program was provided by UTCM and PVAMU. The funding from this project did allow TTI project personnel to visit the program and present information regarding transportation careers, highway planning, and TTI research.

Additionally, PVAMU hosted three students from the 2009 Summer Transportation Institute for the Advanced Institute program. This is a special program that identifies outstanding students who plan to enter college as engineering or transportation professionals. TTI hosted these students for two days of in-depth interaction with researchers. Funding from this project made TTI personnel participation possible. The Advanced Institute students visited members of, the Transportation Operations Group (TOG), the TransLink® Laboratory (see Figure 3), the Safety Division (see Figure 4) and the Environmental Rainfall Simulator at the TTI Riverside campus, and the Visualization Laboratory on the first day. On the second visit to TTI, the students toured the asphalt and pavement laboratory, had a working lunch to discuss careers and opportunities in transportation with members of UTCM and TOG, and ended the day with a visit to the George Bush Presidential Library and Museum.



Figure 3. Visiting TransLink® at TTI.



Figure 4. Scholars Visit Riverside Campus TTI Facilities.

Texas A&M University–Kingsville

The Kingsville program was held from June through June 11, 2010. Eighteen students attended the program. The group consisted of 14 girls and 4 boys; this is the first time in the history of the program that the class was comprised of more girls than boys. The week’s activities featured hands-on activities, team-building exercises, and a field trip to the Texas Department of Transportation (TxDOT) Corpus Christi District. The activities selected for the week emphasized math, technology, and science and allowed students the opportunity to work individually and as part of a team. The trip to the TxDOT Corpus Christi District was a special treat because all of the engineers conducting the tour and tour activities were past Summer Institute participants and graduates of Texas A&M University–Kingsville. The funding for this program was provided by the SWUTC grant, TTI, and the Frank H. Dotterweich College of Engineering at Texas A&M University–Kingsville. This project provided funds for some of the TTI staff’s travel and supplies.

6.3 EVENT ASSESSMENT

TTI has been actively involved with Summer Institutes for more than 12 years. During this time, the primary funding for the program has been from the Federal Highway Administration (FHWA) Office of Civil Rights. The decision not to fund this year’s camps was announced at the end of April, after recruiting for participants was already underway. Participating faculty members at both Prairie View A&M University and Texas A&M University–Kingsville, as well as key members of TTI, made the decision that the summer experience for students was too important to cancel for the year, and they sought alternate funding sources. Through generous grant awards from SWUTC and UTCM, as well as additional funding from TTI, the Roy G. Perry College of Engineering at Prairie View A&M University, and the Frank H. Dotterweich College of Engineering at Texas A&M University–Kingsville, the institutes were held in June.

The Summer Institutes are an important resource for encouraging young students to pursue careers in transportation, engineering, and technology. This was perhaps most clearly in evidence at the TxDOT Corpus District when all five of the engineers conducting the tours began their introductions with “I attended the Summer Institute when I was your age.” The program has the ability to not only sustain but grow with proper funding sources.

7.0 CONCLUSIONS AND RECOMMENDATIONS

The TTI outreach team has conducted outreach programs and activities for more than 15 years. These events range from one-day events to the longer Summer Institute program. It is evident that these programs are very successful. The students who attended one-day events were provided with an activity that sparked interest in transportation careers and caused them in some instances to seek out further events. Students who attended the Summer Institute programs were exposed to the gamut of

career opportunities within the transportation industry, had the opportunity to gain hands-on technical experience, networked with professionals to learn more about career choices, and learned skills needed for success in college.

It is disheartening to note that these outreach programs reach only a small portion of the population of Texas. The vast portion of Texas students, including some of the neediest (students in rural south and west Texas), do not have access to such outreach programs. The funds needed to conduct programs are not great. The average cost for a one-day event is often less than \$5,000, and the average cost for a summer program is \$4,000 per student for a two-week program. Funding for the programs comes from grants that are primarily funded through UTCM, SWUTC, and FHWA. These grants are often only one year in length, and the funding for the Summer Institute programs has not increased in the 10 years of the program. At current funding levels, it has been impossible for the programs to continue in some cases and expand at all into other areas in Texas.

Even more problematic is the consistency of the funding. If funds were dedicated to outreach on a consistent basis, the overall cost of programs would drop and the quality of the programs would rise because program staff could plan and budget on a regular basis, rather than putting something together as funding becomes available. Smaller and more frequent events could also be planned through dedicated funding. This consistency of events would allow student interest to be reinforced and developed through regular contact and programs.

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