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**Extreme Makeover: Using Technology and Social Networks for
Outreach and to Update Existing Transportation Modules**

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ABSTRACT

The transportation engineering profession, like every other profession that relies heavily on the engineering, technology and science fields, faces a challenging future. A recent study by the National Science Board reported a troubling decline in the number of U.S. citizens that are training to become scientists and engineers. The study showed that while more than half of the science and engineering degree holders are age 40 or older, the number of students entering college degree programs in these disciplines have declined. The current and future success of the transportation infrastructure and its diverse array of components depend on developing a cadre of individuals, both male and female, to design, plan, manage, operate, and maintain the vast infrastructure in place

In the past SWUTC has funded numerous projects for transportation outreach for K-12. These projects included: the Transportation Road Show (2002), Careers in Transportation (2003), the Rural Transportation Institute (2004), and Transportation Engineering Education and Outreach Pilot Program Targeting Students in Grades K-12 (1999). Over the past 11 years these modules and presentations have been viewed by over 15,000 students. Some modules are still currently being used by outreach personnel. However, many of the modules are outdated and desperately in needed a makeover in order to make them relevant for today's student audiences.

Technology and the technological IQ of the target audience have changed tremendously in the past 11 years. Today's students surf the web, communicate through Facebook and MySpace, and they also communicate through Twitter and websites such as Squidoo. Many students read blogs on a daily basis, the way older generations read newspapers. Interfacing with students through media that they use on a constant basis will cast a wider net to reach a diverse population of students. This project forms a basis for future outreach projects, by updating previously developed materials, creating a new portal website that can be used for outreach and blogging, as well as the creation of Facebook transportation outreach groups for students.

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1.0 INTRODUCTION

1.1 BACKGROUND AND OVERVIEW

The transportation engineering profession, like every other profession that relies heavily on the engineering, technology and science fields, faces a challenging future. A recent study by the National Science Board reported a troubling decline in the number of U.S. citizens that are training to become scientists and engineers. The study showed that while more than half of the science and engineering degree holders are age 40 or older, the number of students entering college degree programs in these disciplines have declined. The current and future success of the transportation infrastructure and its diverse array of components depend on developing a cadre of individuals, both male and female, to design, plan, manage, operate, and maintain the vast infrastructure in place.

Technology and the technological IQ of the target audience have changed tremendously in the past 11 years. Today's students surf the web, communicate through *Facebook* and *Myspace*, and they also communicate through *Twitter* and websites such as *Squidoo*. Many students read blogs on a daily basis, the way older generations read newspapers. Interfacing with students through media that they use on a constant basis will cast a wider net to reach a diverse population of students.

In the past SWUTC generously funded numerous projects for transportation outreach for K-12. These projects include: the *Transportation Road Show* (2002), *Careers in Transportation* (2003), *the Rural Transportation Institute* (2004), and *Transportation Engineering Education and Outreach Pilot Program Targeting Students in Grades K-12* (1999). The Summer Transportation Institute (STI) is a summer camp conducted by the Texas Transportation Institute (TTI) and various partner universities around Texas. These Summer Transportation Institutes have consisted of three separate but similar programs which are briefly described as follows.

1. *The Summer Transportation Institutes – Funded by FHWA Office of Civil Rights and SWUTC*

TTI has hosted STI's at Texas Southern (Houston), Paul Quinn (Dallas), UTSA and Palo Alto (San Antonio), TAMU-Kingsville, and UTEP (El Paso). (Program duration 12 years).

2. *The Rural Summer Transportation Institute – Funded by SWUTC*

TTI has hosted programs at TAMU-Kingsville and Weslaco/McAllen. (Program duration 2 years)

3. *The Summer Aviation Institute – Funded by SWUTC*

TTI has hosted a program at Conroe (program duration 1 year)

As a part of these projects, a number of educational modules and products have been developed. Over the last 11 years, these modules and presentations have been viewed and used by over 15,000 students. Some modules are still currently being used for outreach. However, many of the modules are outdated and desperately in need of a makeover in order to make them relevant for today's student audiences. This project forms a basis for future outreach projects, by updating these previously developed materials, creating a new portal website that can be used for outreach and blogging, as well as the creation of Facebook groups for transportation outreach and for students who have been involved in transportation summer camps in Texas.

1.2 STUDY OBJECTIVE

The main objective of this study was to update existing outreach materials and utilize online technology to reach the current and future generations of students to encourage their interest in transportation and transportation careers.

2.0 UPDATING MATERIALS

2.1 BACKGROUND

As previously noted, over the past ten years, the Southwest Region University Transportation Center, and other entities have sponsored numerous outreach programs throughout Texas for students from diverse populations. Many of these outreach programs consisted of various one-day events. These type of programs included the *Go Girl!*, *On the Move!*, Career Exploration, Students from Nontraditional Backgrounds, and the STI program. Each of these projects resulted in products used for outreach. These products include:

- Educational modules such as *Sign the Way*, and *Constructing a Balsa Bridge*,
- Career brochures for various transportation careers,
- A website for the Summer Transportation Institute,
- PowerPoint presentations for use by professionals visiting schools, and
- An index of various on-line resources that can be used by students and teachers to further their knowledge on various transportation careers and issues..

2.2 OVERVIEW OF PRODUCTS AND MATERIALS

The first step of updating the various outreach resources produced over the years was to inventory and thoroughly review each product for current relevancy and accuracy. Products were the prioritized to determine what effort was needed to upgrade it. It was also determined at this time to place as many documents as possible into Adobe Acrobat (.pdf) format. This allows modules to be utilized across most platforms and also allows for ease of transmission.

Experience shows that many schools do not have the e-mail or download capability to handle large files.

Educational Modules

After review it was determined that the educational modules required only minimal upgrades.

Career Brochures

One of the main products created by the Career Exploration and Students from Nontraditional Backgrounds was a series of brochures. Each of these brochures was simple generic brochure that described a career opportunity in transportation, the educational requirements for that job, the outlook on employment and the salary that someone could expect to earn in that line of work. These brochures are in a tri-fold format and are in both Microsoft Word and Adobe Acrobat format. Initially ten of these brochures were produced. The brochures have proved to be very popular with career centers, especially at the Junior High School and Intermediate or Middle School levels. Data on these brochures were outdated and generally the brochures needed an updated look.

Outreach Website

TTI created a website designed specifically for promoting the Summer Transportation Institute. This product while highly popular was dated and needed an uplift and revamp. Several years ago, the TTI website provided a page for accessing activities and outreach links for both teachers and students. This page could not be transitioned to the new TTI website due to software and design issues.

2.3 RESULTS

Educational Modules

Since the educational modules required the least amount of effort the team began the upgrade task on this portion of the outreach materials. The *Sign the Way* module required only minimum reformatting to allow it to be placed into Adobe Acrobat format. *Constructing a Balsa Wood Bridge*, *Cardboard Canoes*, and *Building a Tetrahedral Kite* were re-worked and reworded to make instructions clearer and easier to follow.

Career Brochures

All career brochures mentioned above required updating of salary and career outlook. Current information on these topics was researched and the appropriate changes were made. As previously mentioned these brochures were very popular with career centers and counselors, so

in addition to revamping the existing brochures ten new career brochures were created by team members. We now have brochures covering the following transportation careers: bus driver, civil engineer, construction equipment operator, diesel technician and mechanic, electrical and electronic engineer, flight attendant, railroad conductor and yardman, ship captain, truck driver, air traffic controller, airline pilot, automotive service mechanic, boilermaker, ITS specialist, locomotive engineer, reservations and transportation ticket agent and travel clerk, ship mate, surveyor, taxi driver and chauffer, travel agent, and transportation engineer.

Website

A new domain name was created for the website. The new website will be found at <http://www.transportationoutreach.org>. The website was created in Word Press and will soon feature a blog as well information on outreach and transportation careers.

Social Networking Sites

A *Facebook* page for Transportation Outreach has been created that will allow information to be disseminated regarding transportation outreach efforts and careers. It will be linked back to the website to provide friends additional information.

A *Facebook* group also been created. This group is designed to be a networking and communications site for former Texas Summer Transportation Institute (STI) participants. This group is a closed group, meaning that the people requesting to participate must be accepted by the moderator. This allows the moderator to limit participation only to STI former participants. The site will feature pictures from previous camps and will allow participants access to discussions on transportation careers and mentoring. Once the *Facebook* pages are fully operational, pages on *My Space* and *My Life* will be launched and a *Twitter* link to all of the pages will be initiated.

3.0 SUMMARY AND CONCLUSIONS

In the past SWUTC, FHWA, and TTI have generously funded numerous projects for transportation outreach for K-12. These projects include: the *Transportation Road Show* (2002), *Careers in Transportation* (2003), *the Rural Transportation Institute* (2004), *Transportation Engineering Education and Outreach Pilot Program Targeting Students in Grades K-12* (1999), and Summer Transportation Institutes (1998-present). Numerous outreach activities and products were created as a result of these projects.

Technology and the technological IQ of the target audience have changed tremendously in the past 11 years. Today's students surf the web, communicate through *Facebook* and *Myspace*, and they also communicate through *Twitter* and websites such as *Squidoo*. Many students read blogs on a daily basis, the way older generations read newspapers. Interfacing with students through media that they use on a constant basis will cast a wider net to reach a diverse population of students. By revamping and updating materials and websites and creating social networking links and portals this project will allow these materials to be utilized in the future.