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CENTER FOR INFRASTRUCTURE ENGINEERING STUDIES

2007 SUMMER TRANSPORTATION INSTITUTE FINAL REPORT

by

Mr. Heath Pickerill, Director



**UTC
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**A University Transportation Center Program
at Missouri University of Science & Technology**

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<p>16. Abstract</p> <p>The Missouri LTAP at the Missouri University of Science & Technology hosted its eighth U.S. Department of Transportation Summer Transportation Institute (STI). The mission of the institute's program is as follows:</p> <p><i>To contribute to the development of a diverse, well-qualified workforce for the transportation industry by encouraging secondary school students to pursue transportation careers.</i></p> <p>In concert with this mission and with MST's unique strengths, the objectives of this effort were to provide an educational experience for high school students which explored a wide variety of aspects of the transportation industry and its role in our society. To that end, the STI curriculum provided educational opportunities for its students in critical areas of transportation. The twelve tenth-, eleventh- and twelfth-grade students who were chosen for the program were exposed to university life, leadership and team-building activities, and a series of guest speakers, hands-on laboratories, and field trips. The institute was comprised of two weeks covering all modes of transportation and was headquartered at the Missouri LTAP Center.</p> <p>The Federal Highway Administration's money was used as "seed" money to fund the institute, which cost more than twice the amount funded. Staff from the Missouri LTAP and Distance and Continuing Education Department of UMR conducted the two-week institute. Government agencies and private firms provided substantial support in funding, staff assistance and educational materials as well.</p> <p>Youths from across the State of Missouri were recruited. Program brochures and applications were distributed to more than 1,500 high school students who had indicated an interest in engineering; STI staff contacted all high school counselors who have recommended former program participants; parents of former STI participants were again asked to recruit; and the National Society of Black Engineers and local MODOT personnel were also again asked to help to identify and recruit likely candidates. Twelve applications were received and twelve were accepted. Applicants were selected based upon their academic standing and their essays explaining their interest in transportation. The average grade point average of the chosen group exceeded 3.0 on a 4.0 scale. Five of the twelve were entering tenth grade in the fall, four were entering eleventh, and three were entering twelfth. There were four African Americans and eight Caucasian. Two of the students were female and ten were male. Additional demographics details are listed in the attachment.</p>		

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submitted by
Mr. Heath Pickerill, Director



UMR
UNIVERSITY OF MISSOURI-ROLLA

Missouri LTAP
710 University Drive, Ste. 121
Rolla, Missouri 65409-0030
umrsti@umr.edu

ABSTRACT

The Missouri LTAP at the University of Missouri-Rolla hosted its eighth U.S. Department of Transportation Summer Transportation Institute (STI). The mission of the institute's program is as follows:

To contribute to the development of a diverse, well-qualified workforce for the transportation industry by encouraging secondary school students to pursue transportation careers.

In concert with this mission and with UMR's unique strengths, the objectives of this effort were to provide an educational experience for high school students which explored a wide variety of aspects of the transportation industry and its role in our society. To that end, the STI curriculum provided educational opportunities for its students in critical areas of transportation. The twelve tenth-, eleventh- and twelfth-grade students who were chosen for the program were exposed to university life, leadership and team-building activities, and a series of guest speakers, hands-on laboratories, and field trips. The institute was comprised of two weeks covering all modes of transportation and was headquartered at the Missouri LTAP Center.

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Youths from across the State of Missouri were recruited. Program brochures and applications were distributed to more than 1,500 high school students who had indicated an interest in engineering; STI staff contacted all high school counselors who have recommended former program participants; parents of former STI participants were again asked to recruit; and the National Society of Black Engineers and local MODOT personnel were also again asked to help to identify and recruit likely candidates. Twelve applications were received and twelve were accepted. Applicants were selected based upon their academic standing and their essays explaining their interest in transportation. The average grade point average of the chosen group exceeded 3.0 on a 4.0 scale. Five of the twelve were entering tenth grade in the fall, four were entering eleventh, and three were entering twelfth. There were four African Americans and eight Caucasian. Two of the students were female and ten were male. Additional demographics details are listed in the attachment.

PROGRAM FACULTY AND STAFF

Description of duties

Director

Ms. Angela Rolufs served as Director in 2007. She took overall responsibility for the successful and timely completion of all tasks, provided direction and inspiration for the project, supervised project staff, and in general, assured that project goals were met.

Assistant Director

Ms. Diane Heckemeyer worked with the Project Director and was primarily responsible for maintaining contacts with speakers, assuring that speakers had what they needed to conduct lectures and laboratories, and arranging field trip activities. She also conducted some lecturing. Specific duties include the following:

- Developed curriculum for transportation program.
- Organized resource material.
- Set up and implemented laboratory activities.
- Coordinated of field trips.

Counselors

The campus centralized the interviewing, hiring, and training and scheduling of all counselors. The centralized staffing was directed by a committee of project directors, and all programs benefited. Their combined scheduling efforts made it possible to offer full-time appointments to counselors for the duration of the summer semester. This in turn resulted in a higher quality of student applicants. The “pooling” of funds also resulted in a savings in staffing costs for STI.

The counselors were primarily responsible for guidance of the STI student participants. They resided in campus housing with the participants, aided the participants in navigating the campus, planned evening and weekend recreational activities, accompanied participants to all activities, and coordinated learning opportunities with the University of Missouri-Rolla Career Opportunities Center. They were also responsible for the first level of conflict resolution between participants.

Program Coordinator

This role was fulfilled by UMR Distance and Continuing Education. The office arranges several other similar activities on campus each year. Ms. Sue Turner of the office led the effort once again. She was responsible for all administrative tasks related to the STI. In addition to preparatory tasks, she saw to day-to-day business—such as counselor scheduling, preparation of handouts, student issues, and evening activities—of STI during its operation. Examples include the following...

- Satisfied needs related to laboratory activities and resource materials.
- Organized recreational activities and meals.
- Arranged startup and closing activities.

- Arranged for all student needs while they were on campus (such as insurance, housing and meals, computer accounts).
- Rented vans for transporting students on field trips.
- Maintained budgets/financial records for the project.

Affiliations

Angela B Rolufs Executive Director Missouri Transportation Institute	Sue Turner Director Distance and Continuing Education
Diane Heckemeyer Department Chair, Construction & Civil Technology Linn State Technical College	

ACADEMIC PROGRAM

The institute, headquartered in the Missouri LTAP building, was comprised of two weeks, which focused on learning tracks dealing with all modes of transportation. Each track began with an introductory session in which speakers from the topic area were asked to speak to the group and field questions. These sessions were followed by a series of in-class activities and field trips, which corresponded with the particular theme.

Summary of the 2007 Institute

Roberta Broeker from the MoDOT headquarters and Mary Ridgeway from FHWA kicked off the camp by telling the students about the Missouri transportation system and the roles that MoDOT and FHWA, as well as the citizens of the state, play. Javal Burton of the MoDOT Human Resource department then explained various career possibilities in the transportation field and how to pursue one of these careers. Critical to any of these careers is the ability to work well in teams. To help the students develop their skills in team work, they were challenged with team building exercises at the Universal Challenge Center located in Rolla. The students succeeded in their mission and developed a close bond with one another in the process that served them well in their remaining two weeks and will surely serve them well in their futures (see other related activities for more detail).

In the second half of the first week, the students learned where ideas come from for MoDOT projects. Jay Whaley and Brian Regan, both from MoDOT Planning, then showed them the ARAN van and explained how it operates and what information it provides. Next Carl Callahan, MoDOT Bridge Maintenance, entertained them with stories of “X-rated” bridges. Finally the MoDOT Environmental and Design Crew let the students create their own city, build alternative corridors through the city, and gather public comments from other students in a mock public hearing.

The second week included a visit with Mike Flowers and the staff at DNR's State Land Survey office. Mr. Flowers and the staff did a wonderful job of explaining the background and basics of surveying and how it relates to the entire transportation design process. The students then had the opportunity to complete a surveying field exercise. The students' transportation journey continued with an exercise in understanding the rest of the design process, which was hosted by Frank Weatherford of TranSystems. Each team designed a park; however, they got a dose of reality when changes came in from the mayor, the budget got altered, and there were time constraints that kept them from doing everything they wanted with their design.

The second week concluded with a variety of opportunities in which the students gained first hand experience through bridge building, aggregate sieve analysis, soil compaction testing, a ride on the Amtrak rail system, and various other transportation related exercises. In addition, they visited several transportation museums and various other sites that gave them a very comprehensive view of the transportation world. The camp concluded with a banquet where the students shared their two-week experience with their parents in a multi-media presentation that they produced.

Other Related Activities

Enhancement - Ropes and Challenge Course

The Ropes and Challenge Course at the Universal Challenge Center in Salem, MO provides a set of training tools meant to promote human development through Experiential (Adventure) Education. The tools include group problem-solving games and initiatives, low elements (1-2 feet from the ground), and high elements (30-40 feet up). These activities and physical challenges are used as metaphors to promote development. The Universal Challenge Center has one of the largest and best equipped courses in the Nation featuring state of the art construction and nationally established safety standards. Its accredited staff is experienced in outdoor education, human development, and group dynamics. STI students spent one day receiving some valuable highlights of the course, which are typically several days in length. The UCC Ropes Course tested personal courage, teamwork, and group support as the students faced challenges involving climbing and traversing obstacles high in the air. We hope that students were left with lasting impressions of their experiences that they can draw upon to meet future challenges. The activities are not merely physical challenges, but metaphors for the issues we all face in our personal and professional lives. The course consists of several challenges on which students actually experienced the need to trust team members. Activities included:

- Tank
- Ski-walk
- Tire Swing
- Cable walk
- Spider web
- Flying Fox Zip Line - After climbing to the take-off platform, participants were secured to a pulley that carried them the length of Zip Canyon.
- The Rock Climb A vertical climb using "rock" hand and foot-holds is both a physical and mental challenge. Strength, coordination, and strategy were needed to meet this element.

This was an excellent experience for these young people to build better camaraderie and teamwork skills among the participants.

Newsletter & Design Principles Workshops

Ms. Angie Yowell, owner Angie Yowell Designs, LLC, provided a one day workshop consisting of lecture and hands on exercises in the design and creation of technical newsletters and DVD productions using iMovie. The workshops included typical newsletter personnel structure, newsletter content, graphic design principles, good writing practices, and layout techniques. Students were required to be on teams and photograph their team experiences. They had hands on experience putting the DVD together for a final presentation at the banquet.

Introduction to College Life

The registrar from UMR Admissions provided students information on how to apply to college, what to look for when applying, and financial aid—how to qualify and apply for it. UMR students later gave the STI students a tour of campus.

SPORTS AND RECREATION PROGRAM

UMR's Multipurpose Building This facility has an olympic-size swimming pool and full facilities for tennis, weight lifting, basketball, etc. Students were provided with several free evenings during which many availed themselves of these facilities.

The Centre This facility had many areas of recreational entertainment for the students. It allowed them to swim, play basketball, and have a place to hang out for relaxation.

MARKETING

Youths from across the State of Missouri were recruited. Program brochures and applications were distributed to more than 1,500 high school students who had indicated an interest in engineering; STI staff contacted all high school counselors who have recommended former program participants; parents of former STI participants were again asked to recruit; and the National Society of Black Engineers and local MoDOT personnel were also again asked to help to identify and recruit likely candidates.

The STI Parents Program

This program has essentially two goals: (1) to maintain contact with parents and alumni, which it is hoped, will facilitate tracking and (2) to aid in recruiting each year. Solicitation of additional parent participants continued this year.

CLOSING PROGRAM

The week ended with the closing luncheon to which all parents, students, faculty, staff, advisory committee members and dignitaries were invited. Thirty-six people attended. The program began before lunch with welcoming comments from Angie Rolufs, STI Director, Jerry R. Bayless, Associate Dean for Undergraduate Affairs, and Diane Heckemeyer, STI Assistant Director. Each speaker urged the students to use the information they have gained from and their experiences during the institute in positive ways. Their comments were followed by a DVD presentation

detailing the two weeks for parents and lunch. They were excellent representations of the institute and the fine group of young people who attended this year.

Closing comments by Ms. Heckemeyer included expressions of appreciation to the STI sponsors, Advisory Committee and staff. She gave a special thanks to parents for taking the initiative to involve their children in the STI, and appealed to the students to use their experiences at the institute when making career decisions. The luncheon adjourned at 2:00 PM.