



MISSOURI
S&T

CENTER FOR TRANSPORTATION INFRASTRUCTURE AND SAFETY

2008 Summer Transportation Institute Final Report

by

Heath Pickerill, Director



**NUTC
ETT 229**

**A National University Transportation Center
at Missouri University of Science and Technology**

Disclaimer

The contents of this report reflect the views of the author(s), who are responsible for the facts and the accuracy of information presented herein. This document is disseminated under the sponsorship of the Department of Transportation, University Transportation Centers Program and the Center for Transportation Infrastructure and Safety NUTC program at the Missouri University of Science and Technology, in the interest of information exchange. The U.S. Government and Center for Transportation Infrastructure and Safety assumes no liability for the contents or use thereof.

Technical Report Documentation Page

1. Report No. NUTC ETT229	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle 2008 Summer Transportation Institute Final Report		5. Report Date January 2009	
		6. Performing Organization Code	
7. Author/s Heath Pickerill		8. Performing Organization Report No. 00022594	
9. Performing Organization Name and Address Center for Transportation Infrastructure and Safety/NUTC program Missouri University of Science and Technology 220 Engineering Research Lab Rolla, MO 65409		10. Work Unit No. (TRAIS)	
		11. Contract or Grant No. DTRT06-G-0014	
12. Sponsoring Organization Name and Address U.S. Department of Transportation Research and Innovative Technology Administration 1200 New Jersey Avenue, SE Washington, DC 20590		13. Type of Report and Period Covered Final	
		14. Sponsoring Agency Code	
15. Supplementary Notes			
16. Abstract Missouri LTAP at MST has hosted a USDOT Summer Transportation Institute (STI) for the past several years. The program has been very successful and will again be offered in summer 2008. The STI is a 2, 2-week intensive learning experience held during the summer for high school students. It is targeted primarily toward minorities but not limited to them. The following are goals of the STI: 1.To expose secondary school students to and allow them to participate in a series of academic and practical experiences designed to motivate them toward professions in the transportation industry, and 2.To provide secondary school students with mathematics, science, and technological enrichment to enable them to pursue a career in the transportation industry. The overarching goal is to increase the number of youths entering the transportation profession and aids the university in its recruiting efforts. The students (10th, 11th, and 12th graders) are subjected to a healthy dose of campus life.			
17. Key Words Education, transportation institute, minority program	18. Distribution Statement No restrictions. This document is available to the public through the National Technical Information Service, Springfield, Virginia 22161.		
19. Security Classification (of this report) unclassified	20. Security Classification (of this page) unclassified	21. No. Of Pages 9	22. Price

2008 SUMMER TRANSPORTATION INSTITUTE FINAL REPORT

submitted by
Mr. Heath Pickerill, Director



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

ABSTRACT

The Missouri LTAP at the Missouri University of Science and Technology (Missouri S&T) hosted its ninth 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 Missouri S&T'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 21 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.

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 with minor assistance from the Distance and Continuing Education Department at Missouri S&T conducted the two-week institute. Government agencies and private firms provided substantial support in staff assistance and educational materials as well.

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. Fifty-two applications were received and twenty-six were accepted and of those, twenty-one accepted the award. Applicants were selected based upon their academic standing and their letter of recommendation. The average grade point average of the chosen group exceeded 3.0 on a 4.0 scale. Fourteen of the fourteen were entering tenth grade in the fall, five were entering eleventh, and two were entering twelfth. There were ten African Americans, ten Caucasian, and one Hispanic. Two of the students were female and nineteen were male. Additional demographics details are listed in the appendix.

PROGRAM FACULTY AND STAFF

Description of duties

Director

Mr. Heath Pickerill served as Director in 2008. He 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

Ms. Kristi Barr served as Program Coordinator. 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);
- Maintained budgets/financial records for the project.

Affiliations

Heath Pickerill Director Missouri LTAP	Kristi Barr Program Specialist Missouri LTAP
Diane Heckemeyer Department Chair, Construction & Civil Technology Linn State Technical College	

ACADEMIC PROGRAM

The institute, headquartered in the Missouri LTAP building, was comprised of a two-week session, 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 2008 Institute

The program kicked off on Monday, July 14 with Mr. JT Yarnell giving the students an overview of the transportation system. He also acted as one of the judges for the egg drop contest, which was an exercise that allowed the students to work in groups to design and construct capsules to hold eggs as they were dropped from the height of one story. The exercise was the first opportunity for the students to interact in a team at the camp and start to develop team building skills. It also encouraged them to be creative given limited resources in their attempt to protect the eggs from breaking. On Tuesday, the Universal Challenge Center provided more opportunities for team building. Not only was the course challenging and educational, but it provided a lot of fun. On Wednesday morning, the students learned about the work that MoDOT's environmental staff is involved in on state projects. The students then laid out their own city, with some strategically placed environmentally sensitive areas that had to be considered in the design. This demonstrated the obstacles that often face the environmental staff, as well as transportation officials and designers. Once their cities were developed, the students had to create a highway that went through their city. The final step was for them to present their proposals at a mock public hearing of their peers. Wednesday concluded with a presentation from Darrell Pratte and his staff at the Department of Natural Resources' state land survey office. They explained land surveying and showed the students surveying instruments that varied from ancient to ultra modern. On Thursday, the students visited Fort Leonard Wood Army Installation. They spent the entire day learning about the important role transportation plays in the military. The students also learned about the Army Corps of Engineers in both a military and a civilian role. In addition the students had the opportunity to experience several other activities, which included large vehicle driver simulators, the Fort Leonard Wood Engineering Museum, the Missouri National Guard Blackhawk Helicopter Facility, bridge training and engineer equipment training areas, Forney Air Field and finally a high speed evasive driving course which proved to be the highlight of the busy day. On Friday morning, the students experienced bridge

building as taught by Robin Shepard of Shepard Safety LLC, and also learned about personal protective equipment. On Friday afternoon the students got to practice heavy equipment operations skills on computerized simulators, as well as on real equipment at Linn State Technical College. On Saturday, the students traveled to St. Louis for the day. They started with a tour of the transportation museum and then took a tour of St. Louis Union Station and finally a ride on Amtrak. On Sunday afternoon, the students performed an aggregate sieve analysis and a soil compaction test. This gave them a chance to get their hands dirty while learning about the properties of materials used in road construction.

Monday, July 21 was “highway safety” day at the Missouri State Highway Patrol headquarters in Jefferson City. The students watched a movie on road safety and then had the opportunity to experience the seatbelt “convincer”, a simulator that demonstrates the importance of wearing seatbelts. The students also were able to use drunk-driving goggles and then attempt to pass a field sobriety test. This demonstrated to them how dangerous impaired driving is to them and to others on the road. On Monday afternoon, the students visited the Missouri Department of Transportation (MoDOT). Julie Stotlemeyer with MoDOT instructed the students in striping, signing, and other traffic engineering concepts. Vicky Williams and Kathy Shikles of MoDOT’s Highway Safety division hosted their version of “Are You Smarter than a Fifth Grader” to test the student’s knowledge of transportation. The day concluded with a “No-Zone” demonstration set up by the Missouri Motor Carriers Association and the Wal-Mart distribution center. This allowed each student to view the truck’s blind spots from the driver’s seat and helped them realize the importance of keeping a safe distance when driving behind semi-trucks. On Tuesday morning, the students toured a roadway construction project at Highway 50 and City View Drive in Jefferson City, followed by a tour at one of Jefferson Asphalt’s plant locations also in Jefferson City. On Wednesday morning, the students returned to MoDOT to learn about roadside and bridge maintenance. Later, the students were able to learn various facts about MoDOT in a fun way by participating in a timed scavenger hunt. That afternoon the students toured MoDOT’s sign production shop. They were able to see how roadside signs are made and were amazed at how large the signs actually are. On Thursday morning, the students toured MoDOT’s materials lab. They were able to break a frozen rose and pull a steel bar apart. The students concluded their learning activities on Thursday afternoon with a presentation by Troy Pinkerton of the MoDOT traffic division on ITS, as well as some high-tech traffic engineering methods. Finally, Kim Hickey of MoDOT’s Human Resources talked about career opportunities with MoDOT and gave the student’s some useful tips to develop good job searching skills. On Friday, the final day of the camp, the students joined their parents along with faculty and staff at the closing program.

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. The hope is 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 faced in life, both personally and professionally. 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.

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. Missouri S&T students later gave the STI students a tour of campus.

SPORTS AND RECREATION PROGRAM

Missouri S&T'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 two-week camp ended with a closing luncheon for all parents, students, faculty, staff, advisory committee members and dignitaries. Thirty-six people attended the event held on the campus of Missouri University of Science and Technology in the Havener Center. The program began at 11:30 AM. Before lunch was served, Diane Heckemeyer, STI Assistant Director, gave welcoming remarks. She urged the students to use the information they gained and their experiences from the institute in positive ways. Her remarks were followed by a DVD presentation for the parents detailing all of the activities from the entire two weeks. The DVD played while lunch was served.

Closing comments by Ms. Heckemeyer included expressions of appreciation to the STI sponsors, Advisory Committee and staff. She gave a special thanks to the 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 students who attended were an excellent representation for the institute. The luncheon adjourned at 2:00 PM.

APPENDIX

NAME OF HOST SITE: Missouri University of Science and Technology

YEAR REPORTING: 2008

DATES OF INSTITUTE: July 13-25, 2008

PROGRAM CLASSIFICATION:

HIGH SCHOOL

MIDDLE SCHOOL

RESIDENTIAL PROGRAM

NONRESIDENTIAL PROGRAM

NUMBER OF APPLICANTS: 52

NUMBER OF PARTICIPANTS: 21

NUMBER COMPLETING PROGRAM: 21

ETHNIC BACKGROUND BY NUMBER:

0 NATIVE AMERICAN

10 CAUCASIAN

0 ASIAN

10 AFRICAN AMERICAN

1 HISPANIC

0 OTHER

GENDER: 19 MALE

2 FEMALE

GEOGRAPHIC REPRESENTATION:

NUMBER OF CITIES: 13

NUMBER OF STATES: 5

NUMBER OF COUNTIES: 13

UPCOMING GRADE LEVEL BY NUMBER:

TENTH: 14

ELEVENTH: 5

TWELFTH: 2

SCHOOLS REPRESENTED:

Warrenton High School	Warrenton	Missouri
Sikeston Senior High	Sikeston	Missouri
Memphis Academy of Science	Memphis	Tennessee
Hazelwood East High School	Hazelwood	Missouri
Metro High School	St. Louis	Missouri
Raytown South High School	Raytown	Missouri
Fatima High School	Westphalia	Missouri
Mount Vernon High School	Mr. Vernon	Missouri
Rockbridge High School	Columbia	Missouri
De Smet Jesuit High School	St. Louis	Missouri
Leavenworth High School	Leavenworth	Kansas

West County	Leadwood	Missouri
Oklahoma School of Science & Math	Oklahoma City	Oklahoma
AAEC-PA	Phoenix	Arizona