



MISSOURI
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CENTER FOR INFRASTRUCTURE ENGINEERING STUDIES

2006 SUMMER TRANSPORTATION INSTITUTE FINAL REPORT

by

Angela B. Rolufs



**UTC
ETT179**

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

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16. Abstract <p>The Department of Civil Engineering at the Missouri University of Science & Technology hosted its seventh 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, math and science, personal growth, and computer skills. The fifteen tenth-, eleventh- and twelfth-grade students who were chosen for the program were exposed to university life, leadership and team-building activities, a three-credit college literature course, and a series of lectures, seminars, hands-on laboratories, and field trips. The institute was comprised of four weeks covering college orientation, and highway, air, public and intermodal transportation (see Appendix III.) and was headquartered in Civil Engineering's Butler-Carlton Building.</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. The four-week institute was conducted by staff, faculty, and students from the Departments of Civil Engineering and English. Government agencies and private firms provided substantial support in funding, staff assistance and educational materials as well. See Appendix VIII. for a complete list of sponsors.</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. Twenty-nine applications were received and fifteen were accepted. Copies of recruitment materials are provided in Appendix IX. Applicants were selected based upon their academic standing, recommendation letters, and their essays explaining their interest in transportation. The project team assessed the applications and accepted the fifteen aforementioned applicants. The average grade point average of the chosen group exceeded 3.0 on a 4.0 scale. Four of the fifteen were entering tenth grade in the fall, four were</p>		

entering eleventh, seven were entering twelfth, and there was one student information not returned by the prior Director and the information is unknown. There were nine African Americans, one Asian, two Other, and three Caucasian. Four of the students were female and eleven were male. Additional demographics details are listed in Appendix VI.

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2006 SUMMER TRANSPORTATION INSTITUTE FINAL REPORT

submitted by
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ABSTRACT

The Department of Civil Engineering at the University of Missouri-Rolla hosted its seventh 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, math and science, personal growth, and computer skills. The fifteen tenth-, eleventh- and twelfth-grade students who were chosen for the program were exposed to university life, leadership and team-building activities, a three-credit college literature course, and a series of lectures, seminars, hands-on laboratories, and field trips. The institute was comprised of four weeks covering college orientation, and highway, air, public and intermodal transportation (see Appendix III.) and was headquartered in Civil Engineering's Butler-Carlton Building.

The Federal Highway Administration's money was used as "seed" money to fund the institute which cost more than twice the amount funded. The four-week institute was conducted by staff, faculty, and students from the Departments of Civil Engineering and English. Government agencies and private firms provided substantial support in funding, staff assistance and educational materials as well. See Appendix VIII. for a complete list of sponsors.

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. Twenty-nine applications were received and fifteen were accepted. Copies of recruitment materials are provided in Appendix IX. Applicants were selected based upon their academic standing, recommendation letters, and their essays explaining their interest in transportation. The project team assessed the applications and accepted the fifteen aforementioned applicants. The average grade point average of the chosen group exceeded 3.0 on a 4.0 scale. Four of the fifteen were entering tenth grade in the fall, four were entering eleventh, seven were entering twelfth, and there was one student information not returned by the prior Director and the information is unknown. There were nine African Americans, one Asian, two Other, and three Caucasian. Four of the students were female and eleven were male. Additional demographics details are listed in Appendix VI.

INTERMODAL ADVISORY COMMITTEE

This year the Advisory Committee was used primarily to review the planned curriculum and to help identify speakers and arrange field trips. We are presently seeking a replacement for our Boeing representative. Current membership on the committee is as follows:

NAME: Robert T. Berry TITLE: Vice President AFFILIATION: Burns & McDonnell 1630 Des Peres Road St. Louis MO 63131	NAME: David Williams TITLE: Regional TRAC Director AFFILIATION: MODOT 2217 St. Mary's Blvd Jefferson City MO 65102
NAME: Floyd Harris TITLE: Director AFFILIATION: University of Missouri-Rolla Minority Engineering Office Rolla, MO 65409	NAME: Mara Campbell TITLE: Director AFFILIATION: MODOT Organizational Results 105 Capitol Ave Jefferson City MO 65102
NAME: Sherrie Koechling-Andrae TITLE: Assistant Professor AFFILIATION: Lincoln University College of Business Jefferson City MO 65102	NAME: Allen Masuda TITLE: Administrator AFFILIATION: FHWA, MO Division Office 209 Adams St Jefferson City MO 65101
NAME: Ron Moore AFFILIATION: NSBE	NAME: Sheila Bridges TITLE: Aviation Education Program Mgr AFFILIATION: Federal Aviation Administration 901 Locust Kansas City MO 64106

A draft copy of the institute schedule was sent to the committee for its review. The committee corresponded via email, and it was suggested that several new activities be added to this year's curriculum. Members were assigned a set of tasks in preparation for the STI including arranging the new activities. The committee met via teleconference to discuss STI activities and tasks. Following this communication was maintained on an individual basis via email and telephone.

PROGRAM OBJECTIVES

Strategic Plan

The following outcomes were adopted by the NSTI and were used for this year's program at UMR:

Upon completion of the STI, students shall be able to do the following:

1. Apply analytical skills to basic transportation applications

Instrument

Performance in technical laboratories

Metric

80% of students will perform adequately in labs.

Results

100% performed adequately.

2. Identify career opportunities in transportation

Instrument

Pre- and Post-Test question 1

Class writing assignment in dialogue format on the topic of careers in transportation and the value of diversity in the workplace—each student completes assignment individually

Metric

80% of students should correctly answer question; 80% should receive at least a passing grade on the paper.

Results

59% answered the question correctly.

3. Discuss the topics in the core areas of land, air, water and safety covered in the institute

Instrument

Class writing assignment in newspaper article format on the topic of transportation modes and their impact on the country—each student completes assignment individually

Metric

80% of students should receive at least a passing grade.

Results

Current management assumes this was completed successfully but former director did not leave files to demonstrate results.

4. Name and explain steps necessary to enter college

Instrument

Pre and Post test questions 3, 4, 5, and 9.

Metric

80% will demonstrate an increase in knowledge.

Results

Only 92.5% success was achieved in this area.
A substantial increase from the previous year.

5. Conduct research in a library and on the internet**Instrument**

Class writing assignment in research paper format on the topic of George Washington Carver—each student completes assignment individually
 Egg Hunt

Metric

80% should have a passing grade on both

Results

Current management assumes this was completed successfully but former director did not leave files to demonstrate results.

6. Work in teams**Instrument**

Newsletter Production
 Concrete Mixing, Casting and Testing Labs
 Surveying Lab
 MagLev Lab

Metric

Successful production of newsletter with minimal guidance/intervention; 80% of students demonstrate adequate performance in team-based labs

Results

Newsletter production was carried out efficiently and directed by the student team leaders chosen through elections. 100% adequate performance was achieved in all team-based labs.
This group of students was exceptional at team-oriented activities. This outcome is in part attributed to a change in the order of programming this year. Team building recreational activities were moved to the first week of the program to build a more cohesive group. This change was very successful and will be implemented in the future as well.

7. Discuss the principles of effective leadership**Instrument**

Class writing assignment in format of student choice on the topic of qualities of an effective leader—each student completes assignment individually

Metric

75% to receive an above average evaluation

Results

Current management assumes this was completed successfully but former director did not leave files to demonstrate results.

8. To develop and use employability tools (such as résumés, interview skills, appropriate dress) and to explain the value of work ethics

Instrument

Résumés

Metric

80% should receive satisfactory (1 worst, 5 best) evaluation by staff.

Results

Current management assumes this was completed successfully but former director did not leave files to demonstrate results.

9. Discuss the value of diversity in the workforce

Instrument

Class writing assignment in dialogue format on the topic of careers in transportation and the value of diversity in the workplace—each student completes assignment individually

Metric

80% of students should receive a satisfactory grade.

Results

Current management assumes this was completed successfully but former director did not leave files to demonstrate results.

PROGRAM FACULTY AND STAFF

Description of duties

Director

Ms. Lonnajean Yoest took over as Director in 2004. 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. However, Ms. Lonnajean Yoest left University of Missouri, Rolla, on August 25, 2006 and Angela B. Rolufs has taken her place.

Academic Advisor

Dr. Mohammad Qureshi 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 laboratory activities. He also conducted some lecturing. Specific duties include the following:

- Assisted in academic instruction.
- Aided in the implementation, evaluation and revision of the academic curriculum.
- Organized resource material.
- Set up and implemented laboratory activities.
- Assisted in coordination of field trips.
- Acted in the absence of the Project Director.

Course Instructor

Ms. Sydney Rice taught English 177 Literature and Film. She customized the course to include a focus on transportation and technology, as well as adding emphasis on other student and life skills, such as time management and presentation skills.

Counselors

This year a new approach was taken in staffing: 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

Lonnajeon Yoest, Director Staff Member Civil Engineering	Sue Turner Staff Member Distance and Continuing Education
Ms. Sydney Rice Lecturer English	Dr. Mohammad Qureshi Assistant Professor Civil Engineering

ACADEMIC PROGRAM

The institute, headquartered in Civil Engineering’s Butler-Carlton Building, was comprised of four weeks which focused on learning tracks dealing with college orientation and highway, air, public, and intermodal transportation (see Appendix III.). 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. The “Curriculum at a Glance” can be found in Appendix III.

ENHANCEMENT

The enhancement activities provided this year were chosen and designed to expand students' non-technical abilities, such as leadership, organization, taking responsibility for one's own actions, establishing directions in life, relating to and working with others in teams and in other settings, and using computers. These activities included the following:

- Ropes and Challenge Course

- How to Study Seminar
- Communication Seminar
- Newsletter Workshops
- Design Principles Workshop
- Adobe Photoshop Workshop
- Using the Library Seminar
- Introduction to College Life
- Creating a Resume and Conducting an Interview Seminar
- English 177: Literature and Film

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 spend an afternoon receiving some valuable highlights of the course which is 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:

- Burma Bridge. A quick climb up the pole, then across the cable and back before descending back to the ground.
- Multi-Vine Traverse. With memories of Tarzan, participants crossed this bridge using only one cable for their feet and a series of "vines" hanging from an overhead cable. Balance and concentration were required to traverse this challenge!
- Cat Walk / Balance Beam. Walking across a fallen log 30 feet above the ground.
- 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 and this year, as part of the recommendations from the previous year's participants the activity was moved up to the first week of the institute. It was thought that this would build better camaraderie and teamwork skills among the participants. This change in programming was very successful and will become a regular part of the curriculum.

How to Study Seminar

In this three hour session, topics discussed were: styles of taking notes, what to do with them after they have been taken, and how to study for exams. Other areas covered included how we learn (the learning process) and learning/studying skills specifically for the English course.

Communication Skills Seminar

The students were introduced to principles of effective presentations. Following the introduction, the students participated in a Toastmasters-style meeting and practiced these principles.

Newsletter & Design Principles Workshops

Ms. Lonnajeon Yoest, STI Director, provided two half day workshops consisting of lecture and hands on exercises in the design and creation of technical newsletters using QuarkXPress. The workshops included typical newsletter personnel structure, newsletter content, graphic design principles, good writing practices, QuarkXPress skills, and layout techniques. Students were required to elect newsletter staff positions such as managing editor and artistic director, split into graphic design/layout and reporting teams, and create a newsletter reporting on each week's activities. See student newsletter in Appendix V.

Adobe Photoshop Seminar

Ms. Yoest provided a 3-hour workshop on the use of Photoshop in graphic design capacities. This knowledge was utilized in the production of the student newsletter.

Writing Seminar

Ms. Yoest provided a 3-hour workshop on writing formats and concerns. This knowledge was utilized in the composition of student papers.

Using the Library Seminar

A UMR librarian introduced students to the use of the university library. She provided a tour of the facility and a tutorial on how to find information. The information presented was tailored to an understanding of how to conduct research in for the college course in which STI students were enrolled.

Introduction to College Life

Mr. Jamie (JP) Fransaw, Director of UMR's Minority Engineering Program (MEP) met with STI students and, provided them with an overview opportunities offered through the MEP. Counselors 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. Tours of learning opportunities in various UMR departments were conducted by UMR students and faculty from those disciplines.

Creating a Résumé and Conducting an Interview Seminar

Students created their own résumés under the guidance of UMR Career Opportunities Center personnel and STI counselors. They were presented with interview strategies and then participated in mock interviews.

English 177: Literature and Film

Students were introduced to the joys and rigors of a genuine college course. Ms. Sydney Rice, a lecturer of English at UMR, taught this three credit course specifically for the STI program and as stated above actually tailored the course to reflect the transportation objectives of the STI.

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.

Fourth of July Celebration Several students chose to remain in Rolla during the July 4th holiday. Those that did attended a barbeque and pool party at the academic advisor's house as well as the small town fair/carnival that is held annually at the Rolla Lions Club Park.

Vacationing in Chicago Students were given free time at the end of the trip. They spent an afternoon and evening on Navy Pier, at "Taste of Chicago" and along the "Miracle Mile."

PROGRAM EVALUATION

Meaningful evaluation requires revisiting the outcomes established as part of the program's Strategic Plan. The following discussion provides an evaluation of those outcomes along with an assessment of this year's student evaluations.

Measurable Outcomes Results

One assessment tool that was planned for use was the pre and post test which was administered to students at the beginning and end of the program. Last year's updated test was employed again this year. It seemed that the students this year took the tests (both pre and post) seriously. Results are used here to gain insight into program effectiveness along with the several other instruments designated for this purpose as noted in the presentation of strategic goals above.

1. Apply analytical skills to basic transportation applications

Following an interactive lecture about mathematical models (see slides in Appendix III), students were introduced to the formulation and application of math models and completed related exercises. The TRAC program encouraged the students to apply concepts from math and physics in establishing locations of physical objects, designing bridges and vehicles as well. Technical labs such as the Concrete Mixing, Casting and Testing Labs included testing and application of analytical skills in determining results.

It was hoped that in the process of learning these skills that students would also gain an understanding of the role of math and physics in transportation design and analysis. In addition to homework and frequent admonitions from presenters who stressed the necessity of math and science, there were many examples on field trips and in video presentations that accented the

need for math and science. In all of these sessions, students participated in "real world" applications of the math and physics content that they learn in school - thus, it is hoped, providing them with this "better understanding" described above.

As questions 2 and 8 on the pre and post test have not shown to be a good measure in the past and improvements must be made on these questions, the metric utilized this year was simply performance in technical laboratories such as the Concrete Mixing, Casting and Testing Labs, Surveying Seminar, and Math Modeling Seminar. **MET.** *Overall, instructor feedback regarding student performance in technical laboratories indicated that students increased their knowledge of analytical tools.*

2. Identify career opportunities in transportation

A session titled "Transportation as a Profession" provided an introduction to careers in transportation. The curriculum further provided repeated exposure to a myriad of career paths via classroom presentations, field trips, videos and exploration of the Internet.

A class writing assignment in dialogue format on the topic of careers in transportation and the value of diversity in the workplace was assigned. Current management assumes this was completed successfully but former director did not leave files to demonstrate results.

3. Discuss the topics in the core areas of land, air, water and safety covered.

The curriculum is designed to expose students to various topics in these areas. A class writing assignment in newspaper article format on the topic of transportation modes and their impact on the country (based upon student experiences during the institute and student research) was assigned. Current management assumes this was completed successfully but former director did not leave files to demonstrate results.

4. Name and explain steps necessary to enter college

A 92.5% success was achieved in this area. *A substantial increase from the previous year.*

5. Conduct research in a library and on the internet

The class writing assignment in research paper format on the topic of George Washington Carver and the "Internet Egg Hunt" were utilized to evaluate this outcome. Students were allowed to work in teams for the Egg Hunt homework in concert with last year's program changes. Current management assumes this was completed successfully but former director did not leave files to demonstrate results.

6. Work in teams

With few exceptions (for example the Bridge design laboratory which has each student designing his or her own bridge using software) activities throughout the seminar such as newsletter production, concrete mixing, casting and testing, surveying and MagLev lab activities involved working in teams. Students performed exceptionally well in all such activities. **MET.** *As noted above programming changes which moved team-building extracurricular activities to the*

forefront of the institute schedule appear to have resulted in a more cohesive group of students which functioned exceedingly well in team-based situations.

7. Discuss the principles of effective leadership

A class writing assignment in a format of student choice on the topic of qualities of an effective leader was used to measure this outcome. Current management assumes this was completed successfully but former director did not leave files to demonstrate results.

8. To develop and use employability tools (such as resumes, interview skills, appropriate dress) and to understand the value of work ethics

Students developed their own résumés under the guidance of UMR Career Opportunities Center personnel and STI counselors. During the last week of the institute, a series of mock interviews were held and were critiqued for the students by representatives from the UMR Career Opportunities Center. All comments on the session were very positive. Current management assumes this was completed successfully but former director did not leave files to demonstrate results.

9. Discuss the value of diversity in the workforce

Students were assigned an essay on diversity in the workforce. Current management assumes this was completed successfully but former director did not leave files to demonstrate results.

The several objectives described in the Strategic Plan that are not readily measurable are discussed below. No quantifiable measures were identified to assess the attainment of these.

Non-measurable Outcomes Results

Appreciate what is involved in the planning, design, construction and operation of transportation facilities

These concepts were introduced in the introductory panel discussions. They were then developed using the subsequent site visits pertaining to the respective discussion. At several site visits the STI students were shown plans and told how long the planning and design periods existed prior to the construction phase. The scope of details necessary for the successful operation of airports, traffic flow, highway safety, and waterways were highlighted in many of the field trips.

Understand the interactions among the various modes

The final theme of the institute was intermodal transportation. The prime focus of the Chicago field trip was on intermodal activities. Students were provided a tour of Regional Transportation Authority (RTA) facilities (which include light rail, heavy rail and bus modes) and were provided tours of the Chicago Transit Authority's operations and control centers, a transit station and a transit "yard" by a Senior Transit Analyst for the RTA and the Program Manager for RTA. The Senior Manager of Hub Operations of Corwith Intermodal Facility, provided the group with a three hour tour of the 388 acre facility (the second most productive in the nation).

Speakers in panel sessions and field trips stimulated discussions on the issues and logistics associated with intermodal operation. Comparisons were also made to give students an idea of the relative benefits and costs of hauling freight by rail, water, road and air.

Discuss the major environmental and social issues facing tomorrow's transportation professional

In St. Louis, the proposed expansion of the Municipal Airport, and several highway projects presented fertile ground for several presenters to discuss these issues. The panel discussions and visit to the Lambert Expansion Project office also provided discussions of these sorts of issues.

Student Evaluations of the UMR STI

Once again the director met with the students on the day before the end of the institute in individual "rap sessions" to get personal feedback regarding their suggestions for improvement of the institute. Students in general were very positive about the program, but also provided some excellent suggestions for improvements (see Appendix VII.). Ways to continue to improve in this area will be investigated over the coming year.

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. Copies of recruitment materials are provided in Appendix IX.

Development of an institute website continued throughout the remainder of the year. Next year work on the site will be handled by a student programmer. Site contents will include program curriculum and application information, the national program mission and objectives, a photo gallery of past STI activities, a section devoted to recognition of sponsors, and information regarding institute personnel.

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. Sixty-six people attended. The program began

before lunch with welcoming comments from Lonnajean Yoest, STI Director, Jerry R. Bayless, Associate Dean for Undergraduate Affairs, and Mary Ridgeway, Environmental Engineer at FHWA. 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 slide presentation detailing the four weeks for parents; lunch; and finally student presentations. They were excellent representations of the institute and the fine group of young people who attended this year.

Immediately after lunch the students presented their projects from literature class. Parents/visitors had time to view presentation boards and ask questions.

The Annual Awards Ceremony was held next. Certificates of completion provided by FHWA were given to all attendees who successfully completed the four weeks. In addition to the special award plaques suggested by the NRC, namely, the Director's, FHWA and State DOT awards, special commemorative plaques were prepared for the following:

- **Outstanding Leadership Award** for utilization of personal drive and integrity to effectively engage others to work collaboratively toward a unified goal was granted to Brianna Page.
- **Exemplary Citizenship Award** for service as a mentor and a friend to peers, helpfulness to staff, and an excellent attitude in all activities was granted to Toby McConnell and Adam Smith.

The three "official" awards were given to the three students who combined excellent scholarship, high productivity and significant service to the STI. All students were ranked in each category, categories were then combined and the top three ranked were awarded the plaques. The highest award, the Director's Award, went to Brianna Page; the second award, the FHWA Award, to Ravi Nemani, and the third, the State DOT Award, to Brandon Scott. (See certificates in Appendix IV.)

Closing comments by Ms. Yoest 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.

CONCLUSIONS AND RECOMMENDATIONS

This year's STI at UMR was again the most successful yet. Students were more serious, of a higher caliber and more diverse than in previous years. They were also more demanding. Based upon the outcomes of this evaluation effort and results of querying of students and counselors regarding potential program improvements, the following changes will be considered for future STIs:

- (1) Continue with the inclusion of both daytime "down-time" and college course study sessions, plus added time allotted for writing assignments; these seemed to solve issues students have had in the past.

- (2) This year's move of Challenge Center to the first week was very effective; therefore, continue to make changes in the order of occurrence of institute activities as suggested by students in the "rap session," i.e., move relationship- and team-building curriculum components such as the Lincoln University trip to the opening week of the institute.
- (3) Build short breaks into the curriculum between activities.
- (4) Seek more hands-on activities to enhance the curriculum.
- (5) Continue to improve pre and post tests that involve exclusively multiple choice questions.
- (6) Continue to utilize the centralized staffing approach experimented with this year. (See counselors' comments in "Rap Session" Results (Appendix VII).
- (7) Work to develop related pre-/post-test questions to replace #2 and 8 in order to adequately test student application of analytical skills to transportation problems.
- (8) Work more closely with the Advisory Board and Academic Advisor in establishing an improved strategic plan and curriculum. Similar to previous years, this year the committee mainly served as a review board for the curriculum and a resource for arranging for speakers and field trips. The program would benefit from a more fundamental role for the committee.