



CENTER FOR INFRASTRUCTURE ENGINEERING STUDIES

2004 SUMMER TRANSPORTATION INSTITUTE

By

Lonnajean Yoest

**University Transportation Center Program at
The University of Missouri-Rolla**

**UTC
ETT110**

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Technical Report Documentation Page

1. Report No. UTC ETT110	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle 2004 SUMMER TRANSPORTATION INSTITUTE		5. Report Date December 2004	
		6. Performing Organization Code	
7. Author/s Lonnajeon Yoest		8. Performing Organization Report No. 00000874	
9. Performing Organization Name and Address Center for Infrastructure Engineering Studies/UTC program University of Missouri - Rolla 223 Engineering Research Lab Rolla, MO 65409		10. Work Unit No. (TRAIS)	
		11. Contract or Grant No. DTRS98-G-0021	
12. Sponsoring Organization Name and Address U.S. Department of Transportation Research and Special Programs Administration 400 7th Street, SW Washington, DC 20590-0001		13. Type of Report and Period Covered Final	
		14. Sponsoring Agency Code	
15. Supplementary Notes			
<p>16. Abstract</p> <p>Civil Engineering at UMR has hosted a USDOT Summer Transportation Institutes (STI) for the past four years. The Programs have been very successful. The STI is a 5 week intensive during summer for high school students - targeted primarily toward minorities but not limited to them. The goals of the STI are to:</p> <ol style="list-style-type: none"> 1. 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, 2. Provide secondary school students with mathematics, science and technological enrichment to enable them to pursue a career in the transportation industry. <p>This would help to increase the numbers of youths entering the transportation profession and would help the University in its recruiting efforts. The students (11th and 12th graders) are subjected to a healthy dose of Campus life. Once again we will offer a 3 credit course as part of the curriculum this year and consequently the program length remains at 5 weeks.</p>			
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	22. Price

ABSTRACT

The Department of Civil Engineering at the University of Missouri-Rolla hosted its fifth 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 history 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 History. 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-five 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. Three of the fifteen were tenth graders, five were eleventh graders, and seven were twelfth graders. There were seven African Americans, one Asian, six Caucasian and one Hispanic student. Five of the students were female and ten 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 have identified through the course of the program five new members for the committee and retired five others. 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: Toni Burrows AFFILIATION: Boeing Corporation	NAME: Ron Moore AFFILIATION: NSBE
NAME: Floyd Harris TITLE: Director AFFILIATION: University of Missouri-Rolla Minority Engineering Office Rolla, MO 65409	NAME: Michael Shea TITLE: Division Engineer AFFILIATION: MODOT R& D Division 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: Clarence Dula TITLE: Civil Engineer AFFILIATION: Parsons-Brinckerhof 1831 Chestnut Street St. Louis MO 63103-2225	NAME: Sheila Bridges TITLE: Aviation Education Pgm 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 subsequently met on Tuesday, June 15, at 1:30 p.m. CST 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

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 at least a passing grade.

Results

87% passed

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

80% passed based on assignment content; however, only 60% passed based on format.

Recommend that closer instruction be provided for writing assignments, format examples be provided or aid be given in researching appropriate formats, and more time be allotted for completion of assignments.

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

83% demonstrated an overall adequate level of knowledge coming into the institute. 93% did so following the institute.

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

80% passed on both

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 excellently carried out by students working in teams of their own choosing under the direction of student leaders elected by the students themselves; 100% adequate performance in team-based labs.

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

100% passed. Performance in the area of content was excellent and that in the area of format was *highly* creative.

8. To develop and use employability tools (such as resumes, 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

87% passed.

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

87% passed

PROGRAM FACULTY AND STAFF

Description of duties

Director

Ms. Lonnajeon 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.

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

Dr. Diana Ahmed taught History 176 American History Since 1877. She customized the course to include a focus on transportation and technology.

Counselors

We had three full-time counselors and one part-time counselor this year. Mr. Erick Webster, who has been a part of multiple institutes, functioned as the lead counselor. Other counselors included Ms. Claire Lehman, a former STI participant and mentor who is now enrolled at UMR in the mechanical engineering program, Mr. Clarence Chaney, an undergraduate student in engineering management, and Mr. Chris Campbell, an undergraduate student in the School of Arts & Science.

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 the UMR Outreach Office. The office arranges several other similar activities on campus each year. Ms. Sue Turner of the UMR Outreach Office led the effort once again. The Outreach Office was responsible for all administrative tasks related to the STI. In

addition to preparatory tasks, it saw to day-to-day business—such as scheduling, preparation of handouts, student issues, and evening activities—of STI during its operation. For example, it...

- 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 for the project.

Affiliations

Lonnajeon Yoest, Director Staff Member Civil Engineering	Sue Turner Staff Member Continuing Education
Dr. Diana Ahmed Assistant Professor History	Dr. Mohammad Qureshi Assistant Professor Civil Engineering
Erick Webster Undergraduate Student (upper level) History	Claire Lehman Undergraduate Student Mechanical Engineering
Clarence Chaney Undergraduate Student Engineering Management	Chris Campbell Undergraduate Student Arts & Science, Undeclared

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
- History 176: American History since 1877

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 were unable to experience all of the activities given the limited time frame available (1 evening versus several days) but did receive some valuable highlights of the Course. 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.

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 what information should be put in the students' notebooks.

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.

Adobe Photoshop

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.

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.

Introduction to College Life

Mr. Floyd Harris, 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 office 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.

History 176: American History since 1877

Students were introduced to the joys and rigors of a genuine college course. Dr. Diana Ahmed, a History professor 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.

Rolla's Fourth of July celebration Several students chose to remain in Rolla during the July 4th holiday. Those that did attended a barbeque at the director'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 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 for which 87% of students (greater than the 80% metric) received passing grades. **MET.**

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 for which 80% (equal to the 80% metric) received passing grades based on content. **MET.** *However, as previously noted, only 60% passed based on format. Due to this inconsistency, it is recommended that closer instruction be provided for writing assignments, format examples be provided or aid be given in researching appropriate formats, and more time be allotted for completion of assignments.*

4. Name and explain steps necessary to enter college

This was an unusual year in that 83% of students (as compared to the 80% metric) came in with adequate knowledge in this area. By the end of this year’s institute this number had increased to 93%. **MET.**

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. 80% of students received passing grades on both. **MET.**

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 well in all such activities. **MET.**

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. All students received above average grades on the assignment (exceeding the 75% metric). Performance in both the areas of content and format was outstanding. **MET.**

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. **MET.**

9. Discuss the value of diversity in the workforce

Students were assigned an essay on diversity in the workforce. 90% received satisfactory grades (as compared to the 80% metric). **MET.**

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 Dr. John Allen, Senior Transit Analyst for the RTA and Dr. Mark Pitstick, Program Manager for RTA. Mr. John Clement, Senior Manager of Hub Operations, provided the group with a three hour tour of the 388 acre Corwith Intermodal 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

Results of this year's evaluations are presented in two summary tables in Appendix VII. 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.). As in previous years, there is still a need to improve speaker organization and the level of academic challenge and "hands-on" activities associated with speaker presentations. 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 was begun and will continue throughout the remainder of the year. 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. Seventy-five people attended. The program began before lunch with welcoming comments from Lonnajean Yoest, STI Director, and Jerry Bayless, Associate Dean of Engineering, on behalf of the university; Allen Masuda, Missouri Division Administrator, on behalf of FHWA; and a representative of the National Society of Black Engineers (NSBE). 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 five weeks for parents; lunch; and finally student presentations. The students this year chose to present a series of anecdotes regarding what they had learned about one another through their experiences at STI.

The Annual Awards Ceremony was held following lunch. 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 Ashley Ayuso.
- **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 Alfred J. Massey, Jr.
- **Outstanding Authorship Award** for demonstration of excellence in all areas of composition, including creativity, content, grammar, and diction, was granted to Ashley Escalera. This recognition was newly implemented this year, as this young lady's fine performance on assignments demanded acknowledgement.

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 Caleb Trim; the second award, the FHWA Award, to Paul Nguyen, and the third, the State DOT Award, to Sara Brandt. (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 3:30 PM.

CONCLUSIONS AND RECOMMENDATIONS

This year's STI at UMR was 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 to improve pre and post tests that involve exclusively multiple choice questions.
- (2) Reestablish the crash-cushion design lab and 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.
- (3) 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.
- (4) Increase the four-week schedule back to a five-week one and continuing to require students to remain on campus over the weekends. Implement related changes including spreading out field trips, adding more recreational activities on weekends, inclusion of both daytime "down-time" and history study sessions, and increasing the time allotted for writing assignments.

- (5) 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 Challenge Center activities and the Lincoln University trip to the opening week of the institute.

APPENDIX LIST

Appendix I.	Admissions Packet
Appendix II.	Orientation Materials
Appendix III.	Curriculum Materials
Appendix IV.	Closing Banquet and Awards Ceremonies
Appendix V.	Samples of Student Work
Appendix VI.	Participants and Demographics
Appendix VII.	Evaluation Materials
Appendix VIII.	Sponsors
Appendix IX.	Recruitment Materials
Appendix X.	Preliminary Financial Report

APPENDIX I. Admissions Packet

Sample Acceptance Letter

Letter of Confirmation

Regulations

Certificate of Health

Release Form

Local News Release Information

Personal Items and Dress Code

Housing Regulations

July 4th Departure Form

Invitation to Final Luncheon and Closing Award Ceremonies

Admissions Packet Checklist

University of Missouri-Rolla
SUMMER TRANSPORTATION INSTITUTE (STI)
 Application for Summer 2004

Name:		
Social Security Number:	Gender:	
Address:		
Parent(s)/Guardian(s):		
Parent's Address (if different):		
Telephone (home):	Telephone (work):	
School you will attend in fall 2004:		
School Address:		
Guidance Counselor:		
Telephone:	Email:	
Grade during the 2004-2005 school year (circle one):		
10th	11th 12th	
Math and science classes for fall 2004:		
Math	Science	
Career Interest (Check one)		
<input type="checkbox"/> Accounting	<input type="checkbox"/> Environmental	<input type="checkbox"/> Engineering
<input type="checkbox"/> Architecture	<input type="checkbox"/> Law	<input type="checkbox"/> Technology
<input type="checkbox"/> Business	<input type="checkbox"/> Marketing	<input type="checkbox"/> Construction
<input type="checkbox"/> Criminal Justice	<input type="checkbox"/> Scientific Research	<input type="checkbox"/> Transportation
<input type="checkbox"/> Computer Science		
Essay:		
Describe your career objectives, your interest in transportation, and how the STI can assist you in reaching your goals. Your essay must be typed and can not be more than 1 page long.		
Checklist	Send completed application by April 15, 2004:	
<input type="checkbox"/> Completed Application	Lonnajean M. Yoest, Director	
<input type="checkbox"/> Essay	STI • UMR • 210 Butler-Carlton Hall	
<input type="checkbox"/> Letter of Recommendation from Counselor, Teacher, or Principal	Rolla, Missouri 65409	
<input type="checkbox"/> High School Transcript		



Lonnajean M. Yoest, Director

• • •
Summer Transportation Institute
University of Missouri-Rolla
Civil, Architectural, & Environmental Engineering
210 Butler-Carlton Hall
Rolla, Missouri 65409
• • •

P: 573.341.7200 **F:** 573.341.7245 **E:** umrsti@umr.edu

October 14, 2004

«Fname» «Lname»
«HomeStreet»
«HomeCity», «HomeState» «HomeZip»

Dear «Gender» «LName»:

Congratulations! You have been awarded a full scholarship to attend the 2004 US Department of Transportation (USDOT) Summer Transportation Institute (STI) at the University of Missouri Rolla (UMR), June 20–July 16, 2004. UMR, the Missouri Department of Transportation (MoDOT), and the Federal Highway Administration (FHWA) have agreed to provide educational experiences for outstanding secondary school students like you.

Check-in is on Sunday, June 20, at 4:00 P.M. in the Thomas Jefferson (TJ) Residence Hall located on the UMR campus. Orientation for students and parents follows at 4:30 P.M. Please see the enclosed map and directions.

I have enclosed a copy of the *Letter of Confirmation*. This signed form confirms your commitment to participate in STI 2004. It must be returned to us by 3:00 P.M. CST, May 31, 2004, either by standard mail or fax. Other required forms and a statement from the UMR Housing Office are enclosed for you to review with your parent(s)/guardian(s). Please bring them with you to orientation.

You may contact me or Sue Turner at (573) 341-4550 if you have additional questions about STI.

Congratulations again! We look forward to seeing you on June 20!

Sincerely,

Lonnajean M. Yoest
Director, Summer Transportation Institute
Program Manager, Missouri Local Transportation Resource Center

Enclosures

University of Missouri-Rolla
SUMMER TRANSPORTATION INSTITUTE
Letter of Confirmation

I have read and understand all materials submitted to me in my acceptance letter for the 2004 Summer Transportation Institute. I have also read the Summer Transportation Institute Regulations, and I agree to comply with all stated policies. I understand that non-compliance with the regulations will result in my dismissal from the institute. If dissatisfied with the program, I understand I can leave at any time, after a parent/guardian conference with the Project Director.

Signature (Student)	SS#	Date
---------------------	-----	------

Signature (Parent/Guardian)	Relationship	Date
-----------------------------	--------------	------

Parent/Guardian Telephone Numbers:

Home _____

Work _____

University of Missouri-Rolla
SUMMER TRANSPORTATION INSTITUTE
Regulations

We are excited to have you join us for the Summer Transportation Institute! During the institute, we are responsible for your safety and well-being at all times, in addition to your educational experiences. Therefore, we have established the following set of regulations:

1. Project staff members expect participants to display courtesy and professional behavior toward their peers, the faculty, and the staff at all times.
2. Attendance at all program activities is mandatory. Only excused absences from the project director will be accepted. Students must report illness, injury, etc., to their residence counselors and the project director to be excused from classes, seminars, or labs. Violations may lead to dismissal from the program.
3. Students may not leave campus without the escort of an STI staff member. Residence counselors will make arrangements for shopping, day trips, etc. Any student found or reported off campus unescorted is subject to immediate dismissal.
4. Students may go home on the weekend of July 3-5; they may leave on Saturday after 12:00 P.M. and must return on Monday by 6:00 P.M. Parents must sign students out of the dormitory whenever leaving campus and sign them in when they return.
5. Parents/guardians needing to pick up their children at any time other than the weekend of July 3-5 should notify the director.
5. All residence hall rules of conduct must be followed. A curfew and bed-check time will be set. Students are free to move around inside the residence hall under the supervision of the residence hall counselor.
6. Students are completely responsible for all personal items, including cash.
7. Students with vehicles are expected to keep the vehicles parked in the parking lot during STI. Students are responsible for their vehicles and for checking in and out of TJ as appropriate.

.....
I have read and understand the above regulations.

Signature (Student)

Date

Signature (Parent/Guardian)

Date

University of Missouri-Rolla
SUMMER TRANSPORTATION INSTITUTE
Certificate of Health

**This certificate is for your child's safety and welfare while on campus.
Please print clearly.**

Name: _____

Address: _____

SS#: _____ Age: _____ F/M: _____

Past and Present Medical History

1. Disease: _____

2. Heart disease (Mitral Valve Prolapse, Murmur): _____

3. Lung disease (Tuberculosis, Asthma): _____

4. Neurological conditions (Seizures, Migraine): _____

5. Mental conditions (Anxiety Disorder): _____

6. List any past surgeries or hospitalizations: _____

7. Has he/she ever passed out? _____

8. List any lengthy illness _____

9. List any visual problems _____

10. Sinusitis: _____

11. Hearing loss: _____

12. Anemia/Sickle Cell: _____

13. Rheumatic Fever: _____

14. List any injury or broken bones:

Neck	_____	Elbow	_____	Back	_____
Collar bone	_____	Wrist	_____	Pelvis	_____
Ankle	_____	Shoulder	_____	Hand	_____
Arm	_____	Ribs	_____	Leg	_____

Other: _____

15. List any physical defects: _____
16. Is he/she on any medications? _____
17. List any allergies to food, medications, plants, dust, etc. _____
18. Please list any restrictions related to sports.
 Running _____ Swimming _____ Other _____
19. Please list any injuries or conditions not included above.

Insurance Carrier Information

Carrier Name: _____

Phone Number: _____

Address: _____

Member Number: _____

Group Number: _____

I certify that the above information is true and that the individual named on this certificate is in good health and able to take part in all Summer Transportation Institute (STI) activities at the University of Missouri-Rolla with the exceptions that I have written in this certificate.

I also understand that no physician is available on the campus of the University of Missouri-Rolla during the summer; however, professional nurses will be available. I give permission for limited treatment of minor illnesses and/or injuries. Emergency illness will be referred to the nearest medical facility for care. STI provides an excess policy that will cover costs over other available coverage. However, the first \$200 will be paid for by the institute's policy without contribution from other available insurance coverage.

 Signature (Parent/Guardian) _____
Date

 Notary _____
Date

University of Missouri-Rolla
SUMMER TRANSPORTATION INSTITUTE
Release Form

Permission to Tape or Photograph

Student Name: _____

Date of Birth: _____

I grant written permission to the University of Missouri-Rolla Summer Transportation Institute to make video tapes or photographs of the above named student.

I further authorize the use of such photographs or tapes for brochures, press releases or other recruitment and publicity material without prior inspection on my part.

Signature: _____
(Parent/Guardian)

Date: _____

Witness: _____

Date: _____

University of Missouri-Rolla
SUMMER TRANSPORTATION INSTITUTE
Local News Release Information

This information will be used to complete the data collection for the National Summer Transportation Institute.

Student Name: _____

Local Newspaper

Newspaper Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

Fax: _____

Local Radio

Number (e.g., 104.7): _____

Call Letters (e.g., WXOK): _____

Address: _____

City, State, Zip: _____

Phone: _____

Fax: _____

Local TV

Station: _____

Call Letters: _____

Address: _____

City, State, Zip: _____

Phone: _____

Fax: _____

University of Missouri-Rolla
SUMMER TRANSPORTATION INSTITUTE
Personal Items & Dress Code

PERSONAL ITEMS YOU WILL NEED:

- Toiletries
- Laundry detergent
- Extra blanket and pillows if desired
- Shower cap
- Book bag/carry-all
- Calculator
- Dictionary
- Loose-leaf paper
- Pens/pencils/markers
- Comfortable clothing
- Walking shoes
- Rain coat (with hood)
- Swimming caps, suits/trunks
- Sunday-best clothing for the Closing Ceremonies
- Light-weight jacket
- Alarm clock
- Social security card
- Medication *

* All medication must be accompanied by a signed letter from an attending physician explaining dosage and any relevant instructions for institute staff.

DRESS CODE FOR DAILY ACTIVITIES:

Ladies:

Shorts/Pants/Skirts:

Extremely short or mini skirts are not acceptable. All skirts/shorts must be longer than finger-tip length when arms are resting at one's side.

Shirts/T-shirts:

All tops must cover entire torso; no crop tops or spaghetti-straps.

Shoes:

Comfortable walking shoes; no flip-flops or heels greater than one inch.

Gentlemen:

Shorts/Pants:

All shorts/pants must fit to the waistline with belts. Shorts/pants falling below the waistline are not acceptable.

Shirts/T-shirts:

All tops must cover entire torso; no crop tops or mesh tanks.

Shoes:

Comfortable walking shoes; no flip-flops.

University of Missouri-Rolla
SUMMER TRANSPORTATION INSTITUTE
Housing Regulations

FROM THE DIRECTOR OF HOUSING:

As you prepare to join us, we need to make you aware of a few things which may be of importance to you.

PHONES:

The residence halls provide pay phones only. No in-room phone service is available.

APPLIANCES:

Refrigerators, hot plates, room heaters, and cooking appliances are prohibited.

HOUSING:

The institute will provide sheets, pillows, pillowcases, and a daily towel service. Each dorm resident is responsible for maintaining the order and cleanliness of his/her room. Beds are twin size.

KEYS:

Students will be required to turn in room keys each Friday. There is an additional \$30 charge for lost keys.

Parents of STI participants, we appreciate the confidence you have shown in the University of Missouri-Rolla by entrusting your most prized possession—your children—to us. Along with you, the university can help expose your child/children to and prepare them for the work world of tomorrow.

We hope that your stay with us is pleasant; please feel free to give us your feed back.

University of Missouri-Rolla
SUMMER TRANSPORTATION INSTITUTE
July 4th Departure Form

My son/daughter _____ will/will not (circle one) be departing for the July 4th holiday weekend.

Check out time: _____ (must be after 12:00 pm on July 3)

Check in time: _____ (must be before 6:00 pm on July 5)

The party responsible for transporting my child will be:

_____ (first & last name)

(Signature of parent/guardian)

Name STI Participant: _____

**University of Missouri-Rolla
USDOT 2004 Summer Transportation Institute**

Invitation to Final Luncheon and Closing Award Ceremonies

You are cordially invited to attend our closing luncheon and award ceremonies to be held on July 16, 2004 on UMR's campus in the University Center East. We will begin at 12 noon.

In organizing the luncheon we need to know how many will attend and what special dietary needs we need to accommodate. Please indicate below the number of people from your family, in addition of course to your child participating in the Institute, who will join us for the occasion. Also, please list any special dietary needs any of the attendees has (for example, vegetarian, diabetic).

I very much look forward to seeing you again and to meeting other members of your family.

Sincerely,

Lonnajeon Yoest,
STI Director

Number attending luncheon (not counting STI participant): _____

Special Dietary Needs:

# Attending	No special dietary requirements
# Attending	Indicate Dietary Needs

University of Missouri-Rolla
SUMMER TRANSPORTATION INSTITUTE
 Checklist

CHECKLIST	Reviewed	Completed	Signed	Sent
Letter of Confirmation				
Certificate of Health				
STI Regulations				
Release Form				
Housing Regulations				
Personal Items & Dress Code				
Parent Orientation Session				

Not applicable

APPENDIX II. Orientation Materials

Check-In and Orientation Agenda

Campus Map

Detail Map

Student Handbook

Behavior Guidelines

University of Missouri-Rolla
SUMMER TRANSPORTATION INSTITUTE
Check-In & Orientation
June 20, 2004

- 4:00 p.m. DORMITORY CHECK-IN: Thomas Jefferson (TJ) Hall**
On Bishop Avenue (U.S. 63)
- 4:30 p.m. ORIENTATION: 124 Butler-Carlton Hall (Civil Engineering)**
On the corner of 14th & Pine Streets

WELCOME

INTRODUCTION OF FACULTY AND STAFF – Ms. Yoest

OVERVIEW OF PROGRAM – Ms. Yoest

EXPECTATIONS OF STUDENTS – Mr. Webster

ADMINISTRATIVE ISSUES – Ms. Turner

INSTRUCTIONS TO PARENTS

- Sign in/out
- Supervision
- Telephone calls
- Insurance
- Injuries/Sickness

DORMITORY LIFE

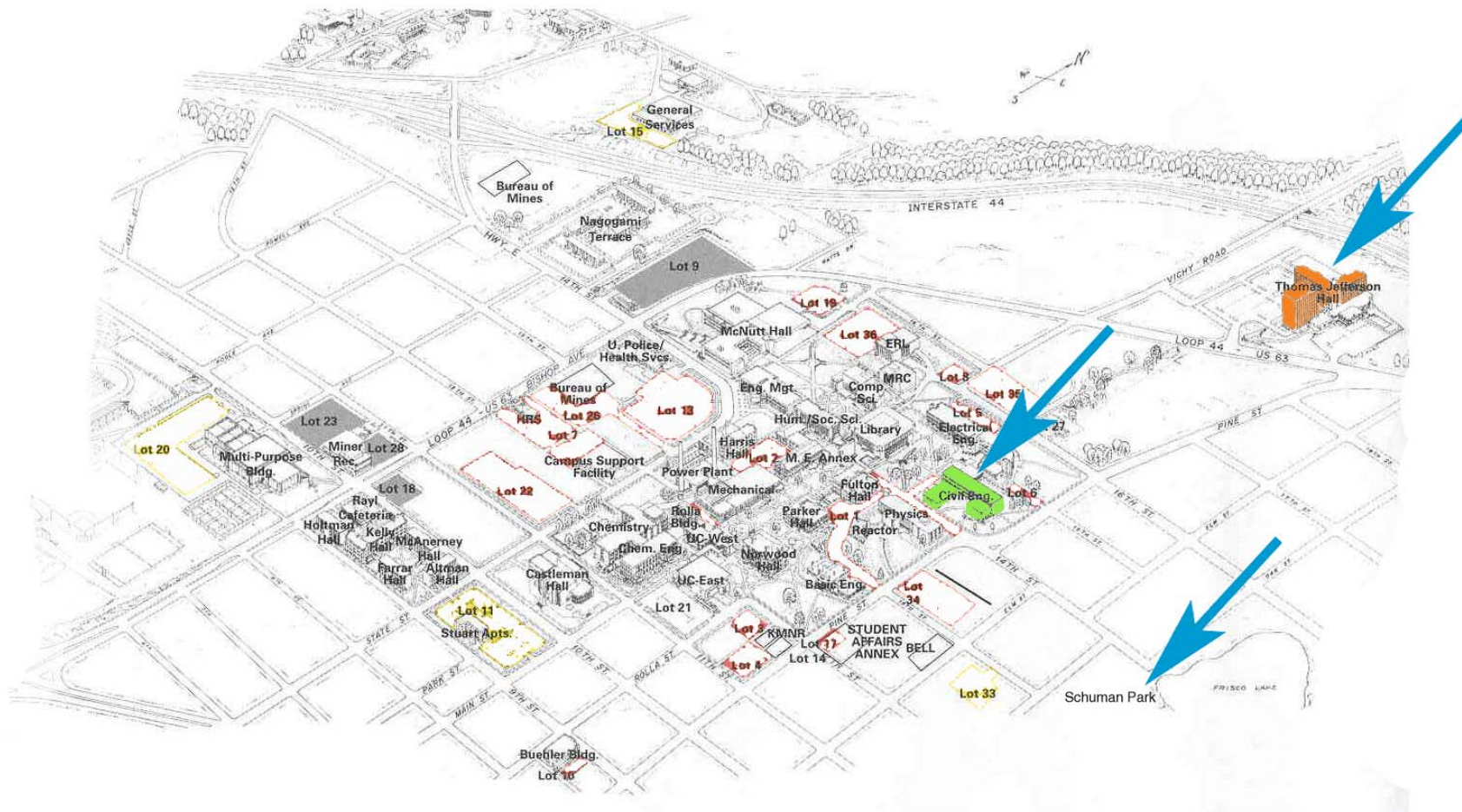
- Room assignments
- Living in a dormitory
- Keys
- Money/valuables
- Clean room daily
- Washing clothing
- Roommate

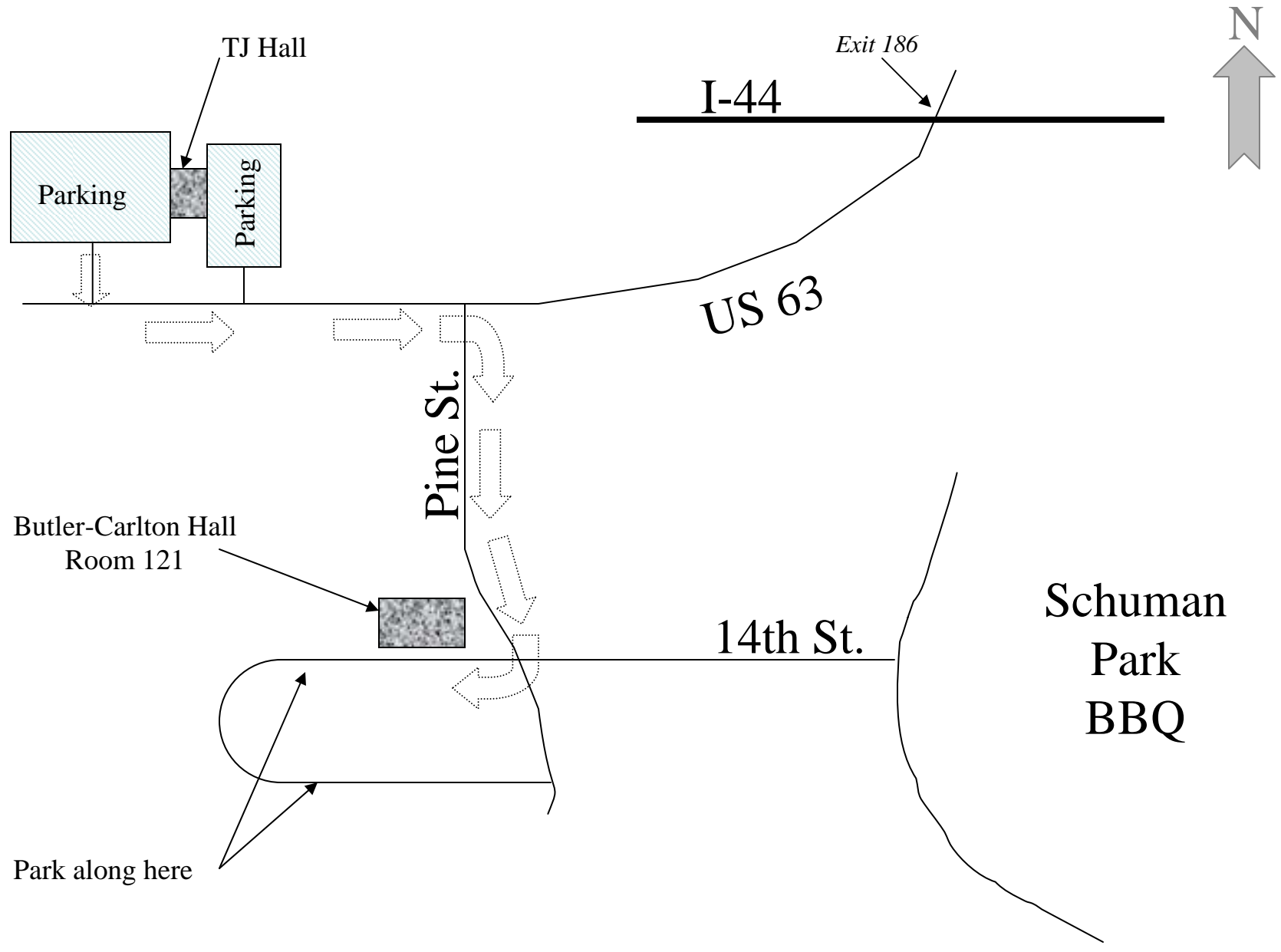
REVIEW AND COMPLETION OF FORMS

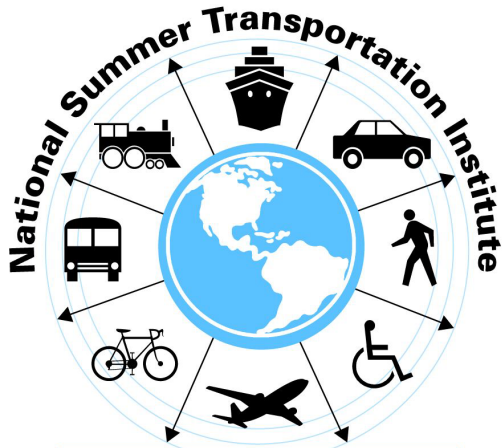
- 5:00 p.m. WELCOME PICNIC: Shuman Park**
On the corner of 14th & Oak Streets

DIRECTIONS:

Take I-44 to US 63 at Exit 186. Go south on US 63 for approximately one mile. TJ Hall is a high-rise brick building (the only one in sight) and will be on your right. Park in any legal spot around the building: there are lots on the north and south sides of the building.







Careers in Transportation
A Universe of Opportunity

2004 Summer Transportation Institute

STUDENT HANDBOOK

Prepared
by
Missouri Local Transportation
Resource Center

UMR
UNIVERSITY OF MISSOURI-ROLLA

OUR HOST UNIVERSITY

University of Missouri-Rolla

The University of Missouri-Rolla (UMR), established in 1870 (as the University of Missouri School of Mines and Metallurgy), is the State of Missouri's primary technological campus. UMR was the first technological institution west of the Mississippi, and one of the first in the nation. It therefore has a long tradition as the leading center in the state for education in engineering and related sciences.

The university's mission is to educate tomorrow's leaders in engineering and science. It offers a full range of engineering and science degrees, and complementary liberal arts degrees and programs. It is a PhD-granting university with undergraduate and graduate programs in the arts and sciences, engineering, and mines and metallurgy. UMR enrolls approximately 4,700 students from 48 states and 66 foreign countries, and is one of the largest producers of civil engineers in the United States. The university has acquired a national reputation for conducting quality research and ranks in the top 100 National Universities in the country. Transportation research topics include transportation safety, intelligent transportation systems, materials and infrastructure systems.

In addition, UMR's Center for Infrastructure Engineering Studies includes one of the 23 University Transportation Centers formed under TEA-21. The centers activities address national needs in the areas of transportation infrastructure focusing on advanced materials and non-destructive testing (NDT) technologies.

Transportation Curricula at UMR

The School of Engineering offers both undergraduate and graduate degrees in civil engineering with a transportation option. The school is accredited by the Accreditation Board for Engineering and Technology.

Other Selected Transportation Programs, Activities, and Memberships

- The Transportation Institute, housed within the Civil Engineering Department
- The Center for Infrastructure Engineering Studies (CIES), sponsored by the United States Department of Transportation
- Missouri's Transportation Research and Education Consortium (MOTREC), sponsored by the Missouri Department of Transportation and the University of Missouri system
- Member of the Transportation Research Board
- Member of the Council of University Transportation Centers

2004 SUMMER TRANSPORTATION INSTITUTE

Objectives

The Summer Transportation Institute is a unique concept that creates an awareness of the attractive career choices and opportunities existing within the transportation industry. Analysts predict that by the 21st century, the transportation industry will experience a shortage in qualified professionals. As a result the U.S. Department of Transportation, state and local transportation agencies, and the University's Transportation Institute have placed a priority on the recruitment of the "best and brightest" young people to form the nucleus of the transportation workforce for the next century. As this country and the entire world become increasingly mobile and interactive, highly trained and broad-minded young professionals become essential. The Summer Transportation Institute was developed to help respond to that anticipated human resource need. To this end, the institute mission is to provide high school students with the following:

- basic information on the significance of the transportation industry;
- an awareness of career opportunities in public and private sectors of transportation;
- exposure to all spheres of transportation, including passenger automobiles, buses, vans, trains, ships, and planes, as well as freight carrier trucking, rail, shipping, airlines, and pipelines; and
- an understanding of engineering and business options available in transportation education at the university level.

Eligibility

Participants must have achieved rising sophomore, junior, or senior status in high school with a minimum grade point average (GPA) of 2.0 on a 4.0 scale.

Qualifications

Participants are selected for the Summer Transportation Institute based on their academic achievement, expression of interest in transportation as a possible career choice, and written a recommendation from the student's high school counselor or an instructor.

Site

The institute is headquartered in the Civil Engineering Department on the UMR campus. The 2004 Summer Transportation Institute is residential; students board in one of the campus dormitories. A portion of the institute activities are held on campus. In addition several field trips will be conducted to a variety of transportation locations. Transportation will be provided for these trips.

Institute Activities

Students will be introduced to theoretical and practical aspects transportation. Transportation education is increasingly interdisciplinary in its orientation. Therefore, students will be exposed to transportation-related disciplines such as engineering, economics, marketing, computer science, and public policy.

In order to provide students with the broadest understanding, a variety of educational activities will be used, including:

- lectures and presentations
- case studies
- group projects
- campus tours
- cultural and social awareness activities
- field trips

Benefits To Participants

The institute provides high school students with opportunities to interact with transportation professionals, and to discuss theory and practice in a classroom setting. It fosters diversity in educational and career opportunities in transportation by providing students with skills that will enable them to make knowledgeable decisions concerning transportation as a major.

Upon successful completion of the Summer Transportation Institute, participants will be awarded certificates acknowledging their participation.

PROGRAM INFORMATION & GUIDELINES

General Guidelines and Expectations

It is our hope that this institute will be a very rewarding experience for our participants as well as the staff. We regard this as an excellent educational experience with room for some fun as well as social events. These guidelines list our expectations of you as participants and the role of the staff in this program.

Program Content

The activities will include: lectures and presentations; case studies; group projects, campus tours (library, computer facility, etc.); extracurricular activities designed to increase the student's cultural and social awareness; and field trips to transportation carriers, construction sites, and government facilities.

Commuting

Program participants are responsible for their own transportation to and from the University weekly. Transportation for field trips will be provided by the institute. Program participants will be responsible for obeying traffic and parking rules and regulations.

Housing

Students will be housed in UMR's Thomas Jefferson (TJ) Dormitory. TJ is administered by a professional live-in residence director and is staffed by paraprofessional students called residence assistants (RA). All rooms are furnished with two beds, closets, desks, chairs, bookshelves and study lamps. Students have the option of bringing personal items to give their room an individual touch. Each floor has its own bathroom, study room and TV lounge. Other facilities in TJ include laundry facilities, computer resource centers, fitness rooms, meeting areas, game rooms, vending machines and convenience stores.

Over the 4th of July weekend students may depart with parents if they choose. Check-out time is any time after 12:00 pm on July 3rd and check-in is anytime before 6:00 pm on July 5th. Students who wish to leave must provide the director with a parent/guardian signed letter stating departure time, transportation method (e.g., with parents, with other denoted relative, etc.), and return time. Students must check-out with the head counselor before leaving and must check-in with him immediately upon returning.

Meals

Most meals will be provided. Program participants must use STI identification in order to eat in the TJ Cafeteria. Meals for which the student is responsible are noted on the curriculum.

Library

Program participants are encouraged to use the Curtis Laws Wilson Library. Student IDs will be necessary in order to check out materials. Library hours are 8:00 AM to midnight everyday.

Staff

We have selected staff to ensure the success of this program, both academically and socially. These individuals were selected for their experience, their academic expertise, and their level of commitment. Our staff will be available to mentor as well as guide the participants through the adjustments to campus life throughout the summer. In addition, transportation professionals from the University, industry, state and federal government agencies will interact with the participants throughout the summer.

2003 Summer Transportation Institute Staff

Director:

Lonnajeon Yoest

Office: (573)341-7500

Home: (573) 341-3538

Administrative Coordinator:

Sue Turner

Office: 341-4550

Counselors:

Erick Webster

Clair Lehman

Clarence Chaney

Assistant Counselor:

Christopher Campbell

General Safety

Even though the University has made every attempt to make the campus a safe place, there are still some responsibilities that students must take upon themselves to ensure their own personal safety. Please adhere to the following guidelines:

- To protect your valuables, always lock your room when it is unoccupied, even if you are only gone for a few minutes.
- Counselors are to know your whereabouts at all times. Do not go off alone without letting someone know where you are. Under no circumstances should you leave campus, except for planned, off-campus activities.
- Do not talk to strangers or give them information. It is not a guarantee that persons who approach you on campus will be University students or personnel.

Key Guidelines For All Participants

1. Must participate in all institute academic activities (seminars, lectures, field trips, projects).
2. Must arrive on time for all functions.
3. Must complete all assignments.
4. Must report any illnesses or emergencies to the designated counselor.
5. Must report any unresolved conflicts to the designated counselor.
6. Must refrain from adverse behavior.
7. Must follow University guidelines.

“Three Strikes Rule” for Failure to Comply with Guidelines

- First Violation:** Student will be given a warning.
Second Violation: Student’s parents will be called.
Third Violation: Student will be dismissed from the program.

“Strikes” can be given by the Director, session leaders, course instructors and counselors. The authority of all such individuals is to be recognized and respected at all times.

Illness

Students should notify a counselor in the event of any illnesses. Students will be referred for the appropriate treatment, and, if necessary, a counselor will arrange transportation to be taken to a local medical facility.

Communication

The participant must have a long distance calling card or cell phone in order to make long distance calls. In case of emergency, parents/guardians may contact the students by calling the Civil Engineering Department, Continuing Education or the Campus Police.

Civil Engineering	(573) 341-4400
Campus Police	(573) 341-4300
Continuing Education	(573) 341-4550

Out of courtesy to session leaders and instructors all cell phones must be turned off during STI activities. Failure to do so repeatedly may result in confiscation of the phone and notification of parents. Students are free to use their phones in the dorms and during non-session times.

Illegal Activities

1. In Missouri it is illegal for persons under the age of 21 to buy, drink or have alcoholic beverages in their possession.
2. It is illegal to buy, sell, use or possess any type of illicit drug, such as marijuana, cocaine, crack, etc.
3. University policy makes it illegal to have firearms on University property.
4. Calling in a false alarm (911) to the police or fire department is illegal. It is also illegal to set off the fire alarm in University buildings when there is no fire.

End of Institute Procedures

On the final day of the institute, all students are to go through an official check-out with their counselor.

- Do not leave any items in the classroom.
- All books, property and material belonging to the Transportation institute must be returned to the institute.
- All books and materials which are the property of the University library must be returned to the Library.
- All assignments and evaluations must be completed.

NOTE:

The above procedures are also to be followed if you leave the institute before the last day of the program.

University of Missouri-Rolla
SUMMER TRANSPORTATION INSTITUTE
Behavior Guidelines

Participants will use acceptable language.

Participants' behavior should not inhibit instruction or the learning of other students.

Electronic devices such as, but not limited to, radios, CD players, cellular phones, and beepers; will be kept at the dorm and are for use during free time only.

Weapons of any kind including, but not limited to, simulated toy handguns, explosives, firecrackers, matches, lighters, and knives are strictly prohibited.

Hats and sunglasses are not to be worn inside buildings (except under doctor's written orders);

Students are not permitted to leave campus unless accompanied by a counselor or guardian.

Students will not make disrespectful or threatening comments, or exhibit rude behavior toward staff members, visitors, or other students.

Activities which are unsafe or objectionable will not be allowed during the program.

Students are discouraged from bringing valuable items to camp. Safety of the item is the responsibility of the student.

Students will refrain from any activities leading to the destruction or defacement of personal property; either belonging to the school, school personnel, or other persons.

Students will refrain from the use of drugs, alcohol or other legally restricted substance.

Students will not be allowed on floors of the opposite gender or in uninhabited area of the residence hall. Group activities will take place in the downstairs common areas of Thomas Jefferson Residence Hall (TJ).

Thomas Jefferson Hall rules will be followed while in the dorm.

Displays of affection such as holding hands, necking, kissing, and sitting on laps, or other physical displays of affection, constitutes inappropriate behavior and is subject to disciplinary action.

APPENDIX III. Curriculum Materials

Curriculum at a Glance

Guidelines for Sessions

Principles of Surveying

Mathematical Modeling Seminar and Assignment

Description of Concrete Mixing, Casting and Testing Labs

Graphic Design Principles Workshop

Newsletter Basics Workshop

Writing Assignments

Internet Egg Hunt

2004 STI CURRICULUM AT A GLANCE

	21-Jun Monday	22-Jun Tuesday	23-Jun Wednesday	24-Jun Thursday	25-Jun Friday	26-Jun Saturday	27-Jun Sunday
7:00 AM					<i>Travel to Springfield 7:00</i>		
8:00 AM				<i>Travel to Jefferson City 7:45</i>			
9:00 AM	Tour of Campus (Webster)	Transportation as a Profession (124 BCH)	Concrete Samples (Lusher) (110 BCH)	Introduction to Highway Transportation & FHWA (Masuda/Frazier)	Springfield Traffic Mgt. Center Sign & Paint Shop; Signal Shop Intersection Operation Tour	Design Workshop (114 CSF)	Free Time
10:00 AM	Student IDs (Webster)						
11:00 AM	Entrance Exam (124 BCH)						
12:00 PM	Lunch-TJ	Lunch-TJ	Lunch-TJ	Lunch-TJ boxed	Lunch-PROVIDED BY TMC	Brunch-TJ	Brunch-TJ
1:00 PM	Using the Library (Ref. Desk) (MQ/Seguin)	Intro to Math Models (MQ) (124 BCH)	Surveying Lab (Williams/Crites) (meet in 124 BCH; then outside)	State Hwy Patrol Museum MODOT RDT (Shea) 2:30	Hwy. Re-construction Project (MQ)	Activity (Webster)	Writing Assignment (122 BCH)
2:00 PM	Applying for College (Davis) (124 BCH)	Minority Engineering Intro. (124 BCH)					
3:00 PM				<i>Travel to Rolla</i>	<i>Travel to Rolla</i>		
4:00 PM	Dinner-TJ	Dinner-TJ	Dinner-TJ	Dinner-TJ	Dinner-TJ	Dinner-TJ	Dinner-TJ
5:00 PM	Study Habits for History (124 BCH) (Ahmad)	History (124 BCH) (Ahmad)	Study Time	History (124 BCH)	Evening Activity (Webster)	Photoshop Workshop (114 CSF)	History (124 BCH)
6:00 PM							
7:00 PM							
8:00 PM							

	28-Jun Monday	29-Jun Tuesday	30-Jun Wednesday	1-Jul Thursday	2-Jul Friday	3-Jul Saturday	4-Jul Sunday
7:00 AM					<i>Travel to St. Louis 7:00</i>		
8:00 AM		<i>Travel to Columbia 8:00</i>					
9:00 AM	Bridge Design Lab (Williams) (115 BCH)	Columbia Regional Airport	Intro to Public Transportation (MQ) (124 BCH)	Corwith Intermodal Facility		Newsletter Working Session (114 CSF)	Holiday-depart if desired Activity (Webster)
10:00 AM							
11:00 AM				Metra GPS Center			
12:00 PM	Travel to St. Louis Lunch-Provided by CBB	Lunch-ON YOUR OWN	Lunch-TJ	Lunch-ON YOUR OWN	Lunch-ON YOUR OWN	Brunch-TJ	Independence Day BBQ (Lj's House)
1:00 PM			<i>Travel to Chicago</i>	LaSalle St. Rail Station	Lambert Expansion Project (Reitter)	Holiday-depart if desired Activity (Webster)	
2:00 PM	Crawford Bunte Brammeier (MQ)	Newsletter Wrkshp & Planning (124/123 BCH)		Chicago Transit Authority Operations and Control Center	Park/Picnic Dinner-Group Purchase		
3:00 PM							
4:00 PM							
5:00 PM	Dinner-ON YOUR OWN	Dinner-TJ	Dinner-ON YOUR OWN	Dinner-ON YOUR OWN		Dinner-TJ	Dinner-TJ
6:00 PM					<i>Travel to game</i>	Holiday-depart if desired Activity (Webster)	Holiday-depart if desired Activity (Webster)
7:00 PM	Writing Assignment (123 BCH)	History (124 BCH)			Cardinals Baseball Game (Webster)		
8:00 PM							

	5-Jul Monday	6-Jul Tuesday	7-Jul Wednesday	8-Jul Thursday	9-Jul Friday	10-Jul Saturday	11-Jul Sunday
7:00 AM							
8:00 AM							
9:00 AM	Holiday-depart if desired Activity (Webster)	MAGLEV Lab (Williams) (122 BCH)	Lane Springs	ME & Formula Car (Nisbett); AE & Flight Sim Lab (Finaish) (Mechanical Engr. Bldg)	USDCC: AAVG, Steel Bridge HPV, Concrete Canoe, Solar Car Nuclear Power Plant	Activity (Webster)	Free Time
10:00 AM							
11:00 AM							
12:00 PM	Lunch-TJ	Lunch-TJ	Lunch-TJ boxed	Lunch-TJ	Lunch-TJ	Brunch-TJ	Brunch-TJ
1:00 PM	Holiday-depart if desired Activity (Webster)	Newsletter Working Session (114 CSF)		Concrete Samples (Lusher) (110 BCH)	<i>Travel to St. James</i> Challenge Center	Internet Egg Hun (114 CSF)	Newsletter Finishing Sessior (114 CSF)
2:00 PM							
3:00 PM			<i>Travel to Rolla</i>				
4:00 PM			Dinner-ON YOUR OWN	Dinner-TJ	Dinner-TJ	Dinner-TJ	Dinner-TJ
5:00 PM			<i>Travel to Rolla</i>				
6:00 PM							
7:00 PM	History (124 BCH)	History (124 BCH)		History (124 BCH)	History (124 BCH)	Writing Assignment (122 BCH)	History (124 BCH)
8:00 PM							

	12-Jul Monday	13-Jul Tuesday	14-Jul Wednesday	15-Jul Thursday	16-Jul Friday
7:00 AM	<i>Travel to St. Louis 7:00</i>				
8:00 AM					
9:00 AM	Construction Prep Center (Frazier)	Center for Infrastructure Engr. Studies (CIES) Research & Learning (Nanni)	Mock Interviews (COC) (Webster) Final Pres. Planning (123 BCH)	Closing "Rap" Sessions and Exit Exams (123/124 BCH)	Packing and Free Time
10:00 AM					
11:00 AM					
12:00 PM	Lunch-Subway	Lunch-TJ	Lunch-TJ	Lunch-TJ	Closing Luncheon
1:00 PM	ABNA Engineering 1:30 Moore/Adewale	CIES Research and Learning (Nanni)	Lincoln University (Sherrie Koechling-Andrae)* <i>Travel to Jefferson City</i>	Practice Final Presentations (Webster/Counselors) (124 BCH)	
2:00 PM					
3:00 PM					
4:00 PM	Dinner-BBQ with NSBE (Moore)	<i>Travel to St. James</i>			
5:00 PM		Dinner-TJ	Dinner-TJ	Dinner-TJ	
6:00 PM	<i>Travel to Rolla</i>				
7:00 PM		History (124 BCH)	Study Time	History (124 BCH)	
8:00 PM					

Locations Key:
 BCH = Butler-Carlton Hall
 CSF = Campus Support Facility

GUIDELINES FOR SESSIONS WITH HIGH SCHOOL STUDENTS

The standard formal presentation in which the speaker uses powerpoint slides for 20 to 30 minutes is less than ideal for dealing with high school age groups. Less formal and more interactive sessions are much more effective in sparking student interest in the topics being discussed. I propose the following for your visit:

Use the talking points shown below in preparing your remarks. Keep them brief (5 to 10 minutes max!).

TALKING POINTS

- Brief description of your agency and its perspective on transportation
- Transportation issues that you feel are critical and timely – it would be good to be a little provocative here
- What exactly is it that YOU do
- Pearls of wisdom (what are the 2 top things that you'd like to share regarding what you've learned over the years - with regard to choosing and starting a career, or anything else you feel has been important in making you a success in your professional life)

Remarks by panelists will be followed by a question and answer session. I will get the students to generate a list of questions that I'll send to you prior to your session. I'd also like to have some questions from you that I could use to get discussions moving if there's a lull. Again, provocative is good.

If you have visual aids that would significantly enhance our discussions (such as short videos, sets of plans, models, etc.). Or, if you have a hands on activity that you'd like to use, that would be great, just let me know and we can discuss how it can be incorporated into the session.

I want these kids coming away inspired and excited about the topics discussed.

SURVEYING – MEASURING HORIZONTAL DISTANCES

INTRODUCTION

The task of determining the horizontal distance between two existing points is a fundamental surveying operation. Depending on the specific application and the required accuracy, one of several methods may be used to determine the horizontal distance. One such method is called pacing.

In certain surveying applications, only a rough approximation of distance is necessary. Pacing is one way to determine distance without the use of any equipment. Pacing simply involves counting steps

OBJECTIVES

Students will be able to:

1. Determine their own personal unit pace value.
2. Use pacing to calculate rough distance measurements.

MATERIALS

- a. A line of known distance
- b. Student Journal/Notebook
- c. Pen/Pencil
- d. Definition of a Pace
- e. Formulas for Unit Pace

ACTIVITIES

Students will:

1. Determine their pace value

NOTE: A pace is the distance between 2 successive positions of the toes (or heel) of the same foot.

- a. Walk normally along a line of known distance.
- b. Count the number of paces it takes to walk the distance. Record the number.
- c. Repeat steps a and b 5 times.
- d. Average your number of paces. Record the number.

- e. Calculate your Unit Pace using the formula below:

$$\text{UNIT PACE} = \frac{\text{Known Distance}}{\text{Average No. of Paces}}$$

- e. Record the number. This is your Unit Pace Value.

NOTE: A pace is expressed in terms of feet per pace (ft/pace) or meters per pace (m/pace).

2. Once you have determined your Unit Pace Value, you can begin making rough measurements of some distances between two points using the equation below:

$$\text{Distance} = \text{Unit Pace} \times \text{Number of paces}$$

3. Try making several rough measurements. Record your results.

QUESTIONS

1. What surveying application is used for rough distance measurement?
2. What relative accuracy can be expected when measuring distances by pacing?
3. How many paces = a stride?
4. Explain why no two people have the same pace value.
5. What's an advantage of using the pacing method to determine horizontal distance?
6. What's a disadvantage of using the pacing method to determine horizontal distance?

SURVEYING – Using a Transit

INTRODUCTION

One of the traditional measuring instruments used in the field for surveying is the transit. The transit measures horizontal and vertical angles. It consists of an optical line of sight which is perpendicular to and supported on a horizontal axis.

OBJECTIVES

Students will be able to:

1. Design and construct a transit.
2. Measure a long distance indirectly, two different ways.
3. Measure the angles between two distant points.

MATERIALS

- a. cardboard
- b. pen/pencil
- c. graph paper
- d. paper fastener
- e. scissors
- f. stapler/staples

ACTIVITY

Students will:

Activity 1

1. Cut a circle with a 7 inch diameter out of cardboard.
2. Divide the circle into 360 degrees.
3. Cut a second circle with a 5 inch diameter.
4. Cut a strip of cardboard 6 inches x 1 inch. Make the ends pointed by folding.
5. Staple the strip to the 5 inch circle.
6. Place the larger circle under the smaller one and secure them with a paper fastener.
Now you are ready to survey.

Activity 2

1. To find the angle between two distant points (we'll call them points A and B), line up the two paper points with the zero on your scale (cardboard circle) and point A. Without moving the outer circle, swing the part with the pointed ends around and sight on point B. The number of degrees on the scale will be the angle. Practice this a few times.

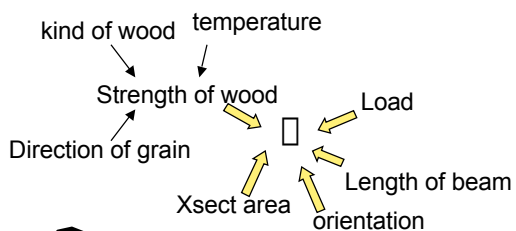
Purpose today

- Define math models
- What are they used for?
- Examples



Group exercise

Given a simply supported beam (ruler on books), what factors affect deflection of beam?

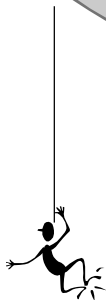
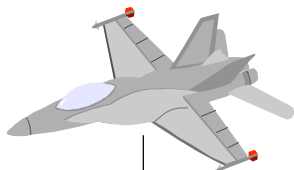


- Strength--E
- Orientation, area -- I
- Length -- L
- Deflection -- δ
- Load -- P

Position variables: PL^2/EI



The helicopter wire



The psi concept

Strength of wire = 60,000 psi

Actual stress on wire should be less than or equal to strength. What variables?

ANS: stress, weight and area

$$\sigma = \frac{W}{A}$$



Exercise 2 (answer)

- Part A: weight 150#, Load/Area=stress
- $150/\text{Area} = 60000$
- $\text{Area} = 0.0025 \text{ sq in} = \text{diameter} = 0.0025'$
- Diameter = 0.056" - - a little less than 1/16"
- Part B: would you be willing to fly 1 mile above the ground to collect your mill?



Engineers' dilemma

- Factor of safety used to assure no failure
 - Too big - will lose contest
 - Too small - will lose contestant
- Common dilemma: min cost vs max safety
- Been around for thousands of years:
 - Hammurabi (2000 BC) - see next page



Code of Hammurabi

"The Babylonian Laws" G.R. Driver and
JC Miles, Oxford Press, 1955, pg 83

- If a builder has built a house for a man and has not made his work sound, the house which he has built has fallen down and so caused the death of the householder, that builder shall be put to death.
- If it causes the death of the householder's son, they shall put the builder's son to death.
- If it causes the death of the householder's slave, he shall give slave for slave to the householder.
- If it destroys property, he shall replace anything that it has destroyed; and, because he has not made sound the house which he has built and it has fallen down, he shall rebuild the house which has fallen down from his own property.

Crash cushions



Crash cushions



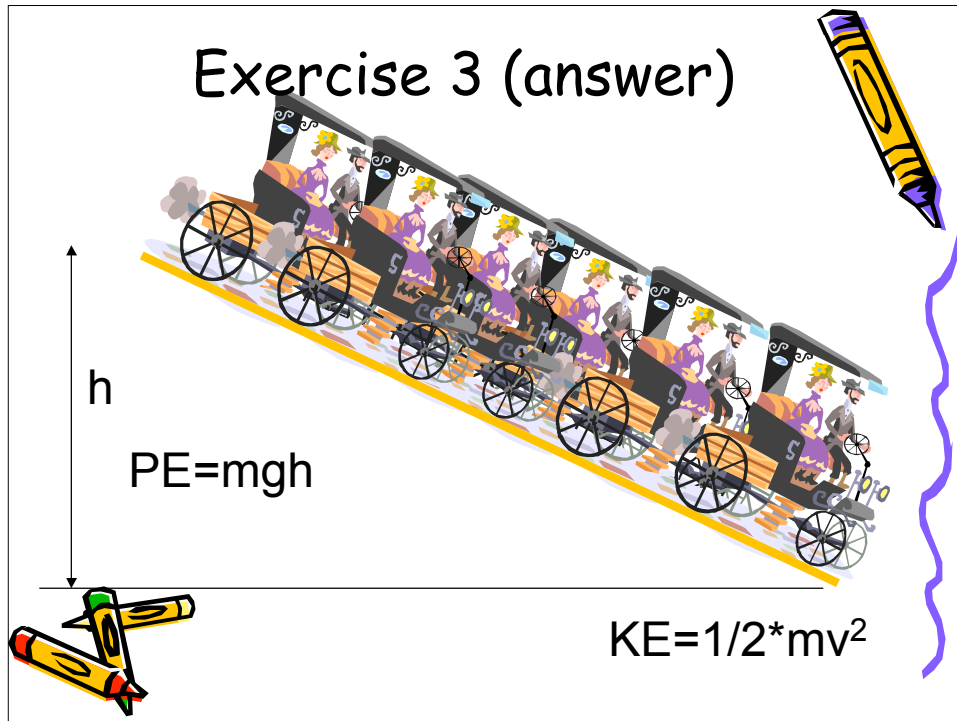
Crash cushions



Crash cushions

- How do they work?
 - Dissipate energy
- Energy - ability to do work
- Two kinds of mechanical energy: PE and KE
- Definition: mass (ability to overcome inertia)
- Do Exercise 3

Exercise 3 (answer)



h

$PE=mgh$

$KE=1/2*mv^2$

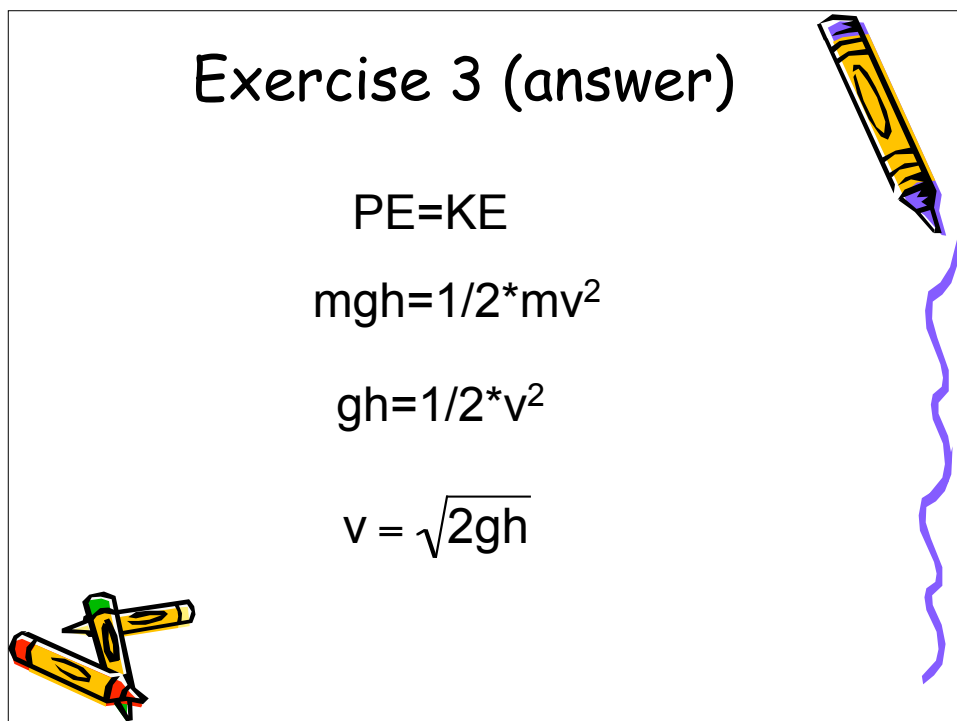
Exercise 3 (answer)

$PE=KE$

$mgh=1/2*mv^2$

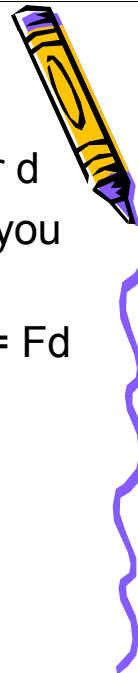
$gh=1/2*v^2$

$v = \sqrt{2gh}$



Crash cushions

- Work - result of application of F over d
- The egg toss - why do you do what you do?
- Energy of egg = energy consumed = Fd
- Same with baseball, do exercise 4



Exercise 4a (answer)



$$KE = \frac{1}{2}mv^2$$

$$= \frac{1}{2} \frac{0.5}{32.2} 32^2$$

$$= 135 \text{ ft-lb}$$



Exercise 4b (answer)



$$KE=135$$

$$= F * 0.5$$

$$F=270 \text{ lb}$$



Crash cushion design models

- Used to design crash cushions
- Variables include:
 - Mass of traveling object
 - Velocity of object
 - Mass of cushions (in various ways)



Crash cushion design models

- Now let's make it real: given my van and the barrels as described, do exercise 5



Exercise 5a (answer)




$$KE = \frac{1}{2}mv^2$$

$$= \frac{1}{2} \frac{4500}{32.2} 88^2$$

$$= 541,118 \text{ ft-lb}$$





Exercise 5b (answer)




Energy dissipated=
Force x distance



F=9000 lb
Distance = 1.5 ft
Energy=13,500 ft-lb

Exercise 5c (answer)



Number of barrels:

$$\frac{\text{KE}}{\text{Energy per barrel}} = \frac{541,118}{13,500} = 40$$



University of Missouri-Rolla
SUMMER TRANSPORTATION INSTITUTE
Math Modeling Exercises

Exercise 1. Group

Given a simply supported beam as described in class, list 3 things that affect its deflection.

Exercise 2.

Suppose I offered you a chance to win \$1,000,000. All you have to do is tell me the smallest diameter steel wire that will hold your weight.

Part 1: Individual

Assume that you weigh 150 pounds, the strength of wire provided is 60,000 psi. What diameter wire do you recommend?

Part 2. Group

To be eligible for the money you must be willing to hang by that wire that you design from a helicopter hovering a mile above the ground. You want to be certain that the wire will hold your weight! Would you be willing to do this? If so, what precautions have you taken to make this wire safe? If not, why not? List 3 reasons.

Exercise 3. Individual

Given Potential Energy (PE) equals Kinetic Energy (KE) for any given object and given that:

$PE = mgh$ and $KE = \frac{1}{2}mv^2$ where m = mass of the object, $g = 32.2 \text{ ft/sec}^2$ and v = velocity of the object, find v in terms of m , g and h .

Exercise 4. Group

Mike James, pitcher for the Cardinals, is able to pitch an 8 oz. baseball at 90 mph (132 fps).

- a) Find the kinetic energy in the baseball in ft-lb when it reaches that speed.

- b) If I were to catch this ball, and typically my hand moves back about 6 inches when I catch it, what force would I feel from this?

Exercise 5. Individual

a) My van weighs 4,500 pounds. Traveling at 60 mph (88 fps), how much energy does it have?

b) Given that a 2 foot diameter barrel crushes down to 0.5 feet when subjected to 9,000 force. How much energy is consumed?

c) How many barrels should be used to dissipate the energy of my van?

SUMMER TRANSPORTATION INSTITUTE

CONCRETE MIXING, CASTING, AND TESTING

The purpose of this laboratory exercise is to give students hands-on experience in mixing, casting, and testing concrete cylinder specimens.

PORTLAND CEMENT CONCRETE (PCC)

Basic concrete is a composite material consisting of aggregates, cement, water, and air. The aggregates are usually gravels or crushed stone (coarse aggregate) and sand (fine aggregate). The cement, water, and air make up a paste within which the aggregates are suspended. Therefore, concrete has two basic phases; aggregates and paste.

LABORATORY EXERCISE

In this exercise, three different concrete mix designs are utilized in which the only difference between the mixes is the ratio of the weight of paste water (i.e. water not absorbed by the aggregates) to the weight of the cement. This water-cement ratio (w/c) is the primary factor controlling the compressive strength of the hardened concrete. Everything else being equal, the compressive strength increases with a decreasing w/c. In applying this concept to the laboratory exercise, w/c values of 0.55, 0.65, and 0.75 are used while all other mix design variables (e.g. paste and aggregate volumes, cement and aggregate types, etc.) are held constant.

The students are divided into three groups and each group is assigned a w/c. Each group is given a spreadsheet that shows the aggregate, water, and cement weights for their particular concrete mix design and they assist in weighing out the constituent materials. A sample spreadsheet is shown in Figure 1. The concrete is mixed and at least two, 6 inch diameter, 12 inch long cylinders are cast per w/c. At this point, the students have completed the first half of the exercise.

Several weeks later, the students return to test the concrete cylinders for compressive strength. During the interim, the cylinders have been stored in a moist-cure room so that water is always available to them and the concrete can continue to gain strength. Each group gathers their respective cylinders from the moist-cure room and proceeds to the load frame room where the samples are tested in compression on a 200,000 pound capacity Tinius-Olsen Universal testing machine.

Determination of compressive strength is accomplished by applying a load to the cylinder in its axial direction until the sample fails (Figure 2). The maximum load

is divided by the cross-sectional area and the compressive strength is stated in terms of stress (or pressure).

Example Mix Design Spreadsheet: w/c = 0.55			
Batch weight calculations:		date: 19-Oct-04	
CA:		FA:	
BSG(od)	2.35	BSG (od)	2.56
TMC (%)	0.5	TMC (%)	3.0
ABS (%)	3.6	ABS (%)	1.3
SMC (%)	-3.1	SMC (%)	1.7
DRUW (pcf)	92.2	FM	2.50
NMS (in.)	0.75		
Bulk Vol.	0.65		
CA (#/cy : od)	1618		
CA (#/cy : ssd)	1676		
Des. slump		w/c: 0.550	
Air Ent.?	4"	cement SG:	3.15
	no	cement (#/cy)	536
		#of sacks	5.71
Water(#/cy)	295		
% Air (assumed)	2		
Adjust weights to field conditions:		Shaded cells indicate calculated values	
Wt.SMC (CA)	-50	Air entrainment dosage:	0
Wt.SMC (FA)	22	(fl. oz./ cwt)	
		Water red./ret. dosage:	0
		(fl. oz./ cwt)	
Batch weights:		Abs. Vol.(cf)	
water (#/cy)	324	water	4.73
CA (#/cy)	1626	cement	2.73
FA (#/cy)	1311	CA	11.03
cement (#/cy)	536	Air	0.54
air ent. (oz/cy)	0.00	FA	7.97
air ent. (ml/cy)	0.00		
water red. (oz/cy)	0.00	FA (#/cy: od)	1273
water red. (ml/cy)	0.00	FA (#/cy: ssd)	1290
		Aggregate % (ssd basis)	Aggregate % (od basis)
		CA	56.5
		FA	43.5
		CA	56.0
		FA	44.0
		Paste	Volume (cf)
			8.00
		Agg.	19.00
			Volume (%)
			29.62
			70.38

Figure 1: Example Mix Design Spreadsheet

Once all of the cylinders have been tested, the students move to a classroom and an analysis of the data is undertaken. A plot of compressive strength versus w/c is generated and discussion follows. An example plot is shown in Figure 3.

CLOSING REMARKS

Although the laboratory exercise is limited in its scope, the students get a real feel for what Portland cement concrete is made of, how it is mixed, molded, and tested. In addition, they learn a fundamental concept in that the cement and water proportions in the mix design have a major impact on the most specified property of hardened concrete; compressive strength.



Figure 2: Compressive Strength Testing of Cylinders

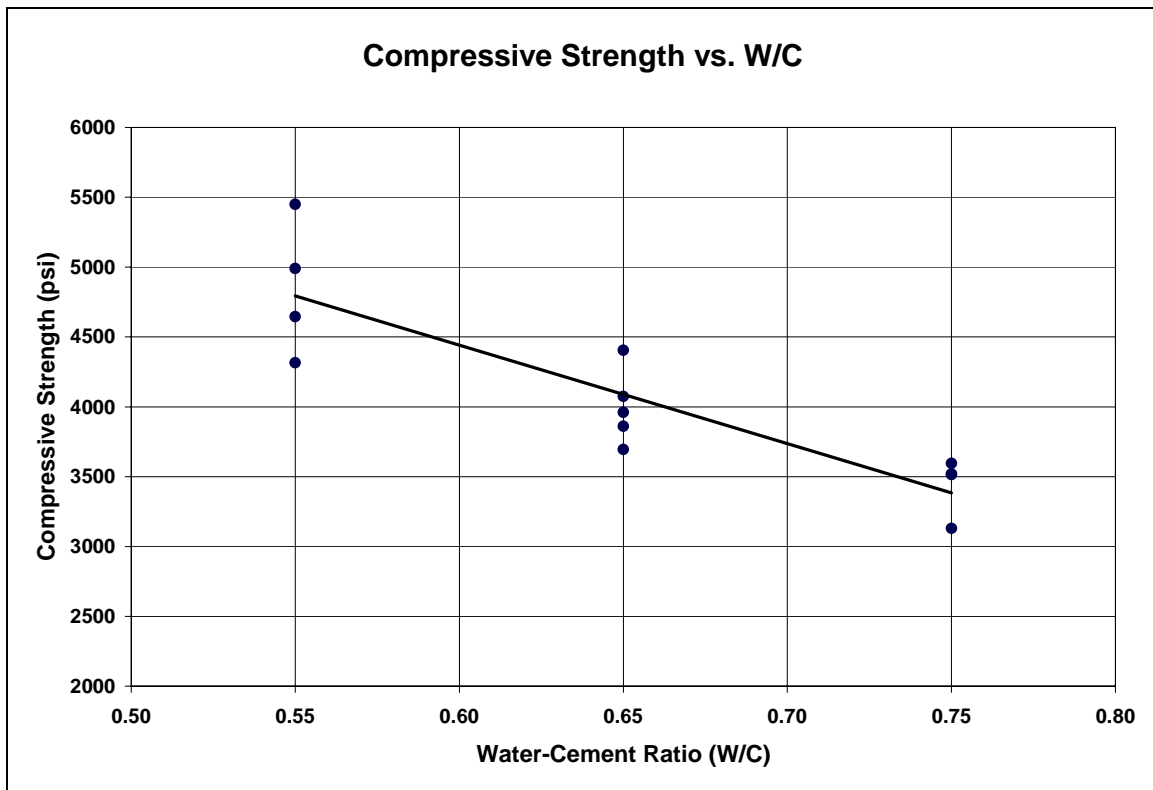


Figure 3: Example Plot of Compressive Strength vs. W/C

Principles of Great Graphic Design

An STI workshop based on
The Non-Designer's Design Book
by Robin Williams

Proximity: the 1st principle

The Principle of Proximity:

Related items should be grouped close together.

Elements in close proximity to each other form a single visual unit rather than separate ones. Scattered design elements make for an unorganized piece with information that's not instantly accessible to the reader.

THE BIG IDEA:

To organize!

Q: How many elements can you find on the card below?

Q: Are any of the separate items related?

Q: Where are you supposed to start and stop reading?

John Doe	(573) 341-5500
The Design Studio	
Graphic Artist	
5771 East O'Rear Road	Rolla, MO 65401

With ONE simple alteration — grouping related elements together into closer proximity — look at the improvement:



Now you know what to read first and where to go from there. You know when you've reached the end and which items belong together. The information is clearly conveyed in only 2 elements rather than 6.

EXERCISE – Proximity

Below are elements of a business card. Design the card grouping related items in close proximity and separating unrelated items.



Art Studio One

Jane Doe

(573) 341-7550

Rolla, MO 65401

Illustrator

12345 Hwy 66

Alignment: the 2nd principle

The Principle of Alignment:

Each design element in a piece should have a visual connection with another element on the page.

Placement of items on a page is NEVER random or arbitrary. Alignment of items on a page draws them together for the eye and the mind.

THE BIG IDEA:

To unify!

Flush Left

This text is flush left. Some people call it left aligned or left justified.

Centered

If you're going to center text, make it obvious.

Flush Right

This text is flush right. Some people call it right aligned or right justified.

Justified

This text is justified — the text lines up along both sides. Do not do this unless your line length is long enough to avoid awkward spaces between words.

General rule of thumb: *don't use too many alignments on a page.*

Q: Three different approaches...which is best and why?

John Doe (573) 341-5500

The Design Studio

Graphic Artist

5771 East O'Rear Road Rolla, MO 65401

The Design Studio

John Doe
Graphic Artist

5771 East O'Rear Road
Rolla, MO 65401
(573) 341-5500

The Design Studio

John Doe
Graphic Artist

5771 East O'Rear Road
Rolla, MO 65401
(573) 341-5500

EXERCISE – Alignment

Below are the elements of a report cover. Design the cover making use of alignment. Don't forget to use proximity, too!

Johnny Doe

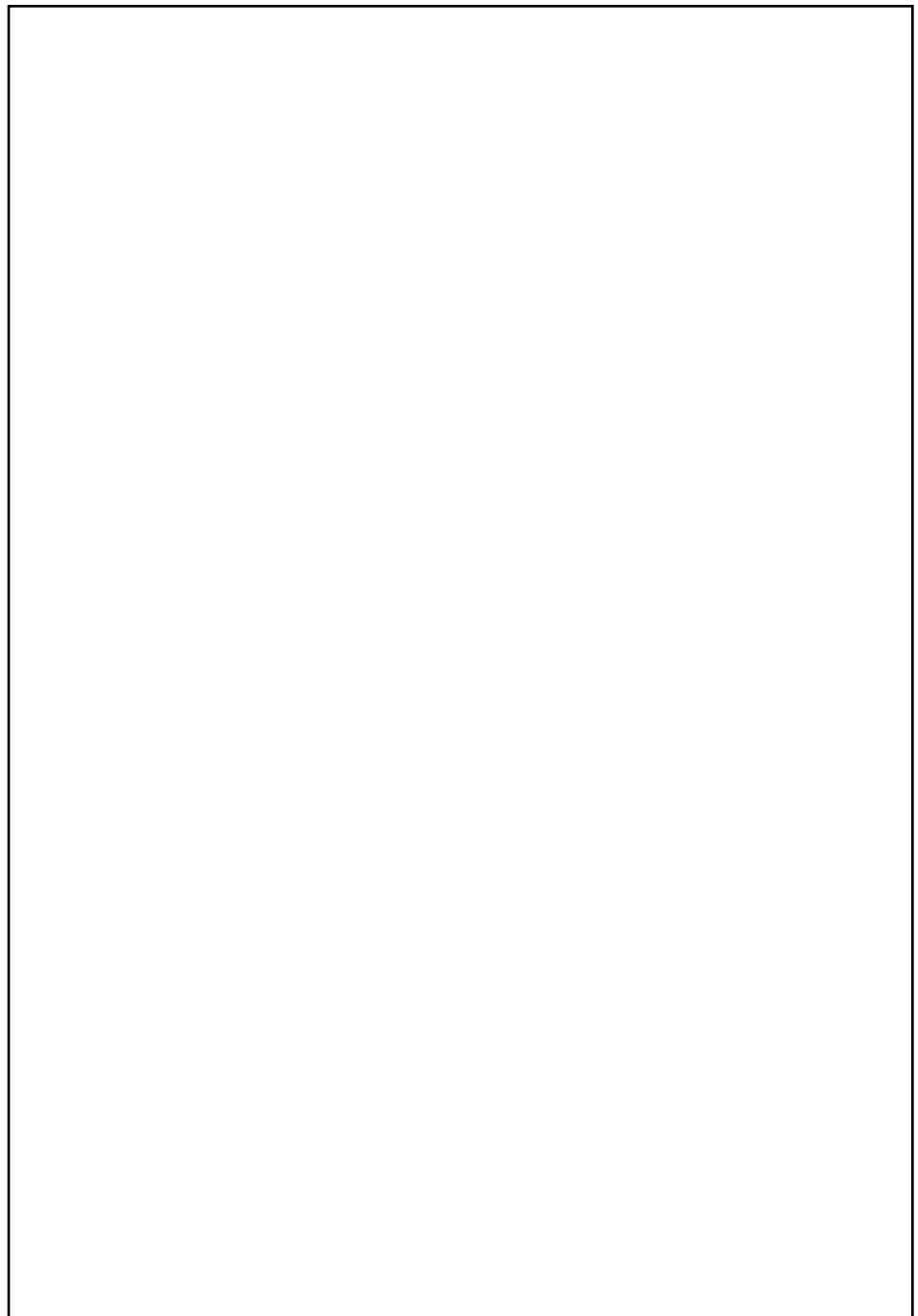
English 101

The Story of the
Great Graphic Designer

February 22, 2003

Mrs. McKinney

Final Book Report



Repetition: the 3rd principle

The Principle of Repetition:

Design elements should be repeated throughout a piece.

Repetition lets the reader know that separate items are part of the same piece. The repeated element may be color, typeface, a rule, a specific paragraph format, etc.

THE BIG IDEA:

Consistency!

Q: What is repeated in the second card below?

Q: Why is this card more effective?

The Design Studio

John Doe
Graphic Artist

5771 East O'Rear Road
Rolla, MO 65401
(573) 341-5500

The Design Studio

John Doe
Graphic Artist

5771 East O'Rear Road
Rolla, MO 65401
(573) 341-5500

Q: What types of repetition can you find below?

Spiderman

- Hollywood Blvd.
Anaheim, California

Employment

- Marvel Comics
- Various movie studios

Education

- The real world

Favorite Activities

- Swinging from tall buildings
- Catching bad guys

Favorite Quote

- A spider is man's best friend.

EXERCISE – Repetition

Below are elements of an advertisement for a sale at the local art supply store. Design the ad using different types of repetition. Don't forget to use alignment and proximity, too!

Portfolios

Colored pencils

3 Days Only

Drawing pads

HUGE SALE!

Art Supplies-R-Us

Glue and glitter

Paint Supplies

Paintbrushes

Miscellaneous Supplies

All supplies 1/2 off!

Watercolors

The chance of a lifetime!

The store for your artistic side

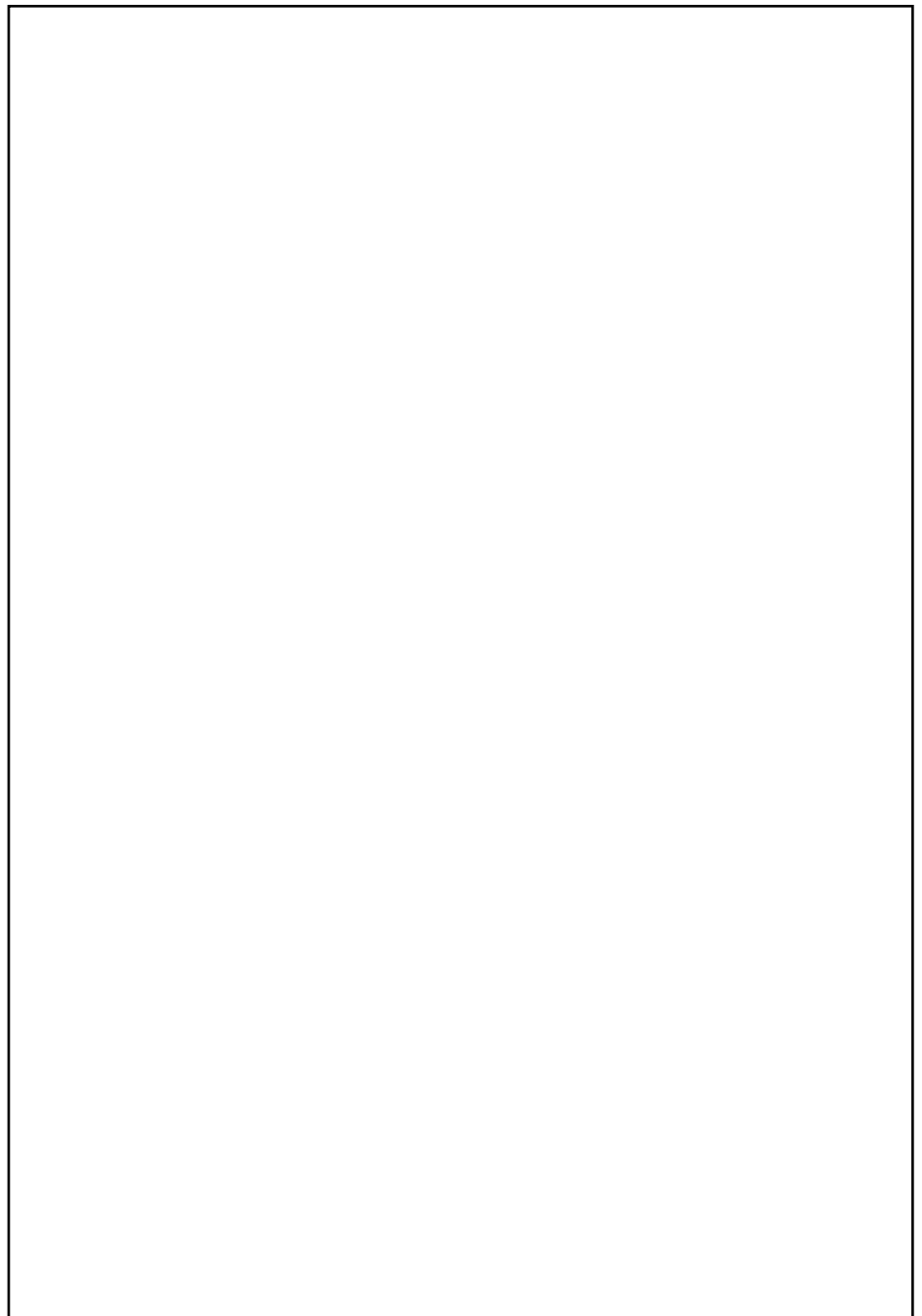
Easels

Friday thru Sunday

Drawing Supplies

Paint Smocks

Don't miss this sale!



Contrast: the 4th principle

The Principle of Contrast:

If items are not related they should be **DISTINCTLY** different.

Contrast is one of the best ways to add impact. Remember that the stronger the contrast, the more effective. **BE BOLD!** If two items are different, then make them *really different*.

You can create contrast by varying size, color, typeface, etc. Just make sure the difference is great enough to be noticed.

THE BIG IDEA:

Make it stand out!

Q: What elements in the card below create contrast?



EXERCISE – Contrast

Take one of your previous exercises (business card, report cover, or advertisement) and redesign it with contrast. Remember: BE BOLD! Make that type BIG and small... **bold** and *italic*... dark and light.

Typography: just the basics

TYPEFACE = FONT

Typeface generally falls into one of two categories:

Serif Fonts

The quick brown fox jumped over the fence. (Times New Roman)

The quick brown fox jumped over the fence. (Garamond)

Sans-Serif Fonts

The quick brown fox jumped over the fence. (Verdana)

The quick brown fox jumped over the fence. (Arial)

There are several subcategories worth noting:

Stylistic Fonts: those with an "artsy" look

The quick brown fox jumped over the fence. (Shuriken Boy)

The quick brown fox jumped over the fence. (SF Balloons)

Script Fonts: those that look "penned."

The quick brown fox jumped over the fence. (Monotype Corsiva)

The quick brown fox jumped over the fence. (Palace Script MT)

Handwriting Fonts:

The quick brown fox jumped over the fence. (KidTypePaint)

The quick brown fox jumped over the fence. (Mistral AV)

Calligraphy Fonts:

The quick brown fox jumped over the fence. (KidTypePaint)

The quick brown fox jumped over the fence. (Mistral AV)

TYPEFACE CHARACTERISTICS

Size: designated units called points

Weight: bold (heavy), medium, light

Style: regular vs. oblique; extended vs. condensed

LEADING, BASELINE SHIFT, TRACKING, & KERNING

Leading: distance from one baseline to the next (in points)

Baseline shift: amount of super- or subscripting (in points)

Tracking: amount of space a set of characters takes up

Kerning: amount of space between two characters

EXERCISE – All in One

- Q: Can you find examples of each of the four design principles in the postcard below?
- Q: Describe the typography of the postcard below.



MINK
the conference for county engineers

WHEN:
October 14-15, 2003

WHERE:
Historic Riverfront Hotel
St. Joseph, Missouri

REGISTRATION FEE:
\$30.00

ROOM COST:
\$55 + tax

REGISTER *online*:
web.umr.edu/~mltrc



Summer Transportation Institute

Newsletter Basics

The Personnel Division

- Reporters
- Photographers
- Graphic Artists
- Editors

What Do Reporters Do?

- Create the “body copy”
 - Investigate potential stories
 - Interview the people involved
 - **WRITE!**

What Do Photographers Do?

- Collect pictures to supplement body copy

What Do Graphic Artists Do?

- Design the newsletter format
- Layout the content w/in that format
- Manipulate photos to fit the space/purpose
- Create supporting graphic elements

What Do Editors Do?

- Conduct the final check on grammar & diction
- Cut or extend articles to fit available space

Who's In Charge?

■ The MANAGING EDITOR

- Supervises the editing team
- Leads the newsletter board meeting
- Assigns stories to reporters
- Has the final say on what goes in & where everything gets placed

Who's In Charge?

■ The ARTISTIC DIRECTOR

- Has the final say on all aspects of layout & design

■ The PHOTO EDITOR

- Decides which photos get used
- Manipulates the photos as needed (touch-ups, etc.)

What's In a Newsletter?

- Flag—the nameplate/title
- Folios—month, date, & year
- Content
 - News stories
 - Editorials
 - Ads
 - Cartoons
- Artwork

Artwork—there's 2 main types

- ILLUSTRATED—images drawn by hand or with computers
 - Cartoons
 - Clipart
 - Supplemental elements
- PHOTOGRAPHIC—images shot with a camera and then manipulated with computers

Copy Style—there's no limit!

- Informational articles
- Q & A
- Editorial articles
- Stylistic pieces
 - Narrator telling a story
 - Poetry
 - Dialogue

Copy Style—aesthetics

- Choose 2 – 3 fonts at most
 - One serif
 - One sans serif
 - One stylistic
- Be consistent: keep font and weight the same for all instances of a category of type
 - For example, all titles sans serif, bold; all bylines sans serif, italics; all body copy serif, plain

AUDIENCE is everything!

- Your readership determines both **FORMAT & DESIGN**

AUDIENCE is Everything!

- Personnel must consider...
 - what material the audience will find interesting
 - how much they'll want to read
 - what language they'll understand
 - what look they'll find appealing

Today's Assignment

- Choose a managing editor
- Hold a board meeting to choose a title
- Split up into 2 teams
 - Reporters: come up w/a content plan
 - Graphic Artists: choose colors & main fonts; design the flag

Content Requirements

- Must be STI-related
- Must include at least 2 articles on topics from your 4 assignments
- Must include a staff page w/pictures & mission statements
- Must include an STI ad

University of Missouri-Rolla
SUMMER TRANSPORTATION INSTITUTE
Writing Assignments

- 1) **Topic:** careers in transportation and the value of diversity in the workplace
Style: dialogue between at least two characters
Length: minimum of one page double spaced in Courier (font); separate title page
Due: June 5

- 2) **Topic:** transportation modes and their impact on the country
Style: newspaper article
Length: minimum of one page double spaced in Courier (font); separate title page
Due: June 5

- 3) **Topic:** George Washington Carver
Style: research paper with thesis and supporting paragraphs; MLA format
Length: minimum of one page double spaced in Courier (font); separate title page
Due: June 10

- 4) **Topic:** your personal mission in life
Style: your choice—be creative! (e.g., fictional narrative, poetry)
Length: your choice
Due: June 10

- 5) **Topic:** qualities of an effective leader
Style: your choice—again, be creative!
Length: minimum of one half page double spaced in Courier (font); separate title page
Due: June 14

- 6) **Topic:** your résumé
Style: your choice—be sure to follow the four design principles
Length: 1-2 pages
Due: June 14

2004 Summer Transportation Institute



Internet Egg Hunt

1. How many vehicle miles did Americans travel on US highways in the year 2000?
2. How many miles of:
 - a. public roads were there in the US in the year 2000?
 - b. public use airports were there in the US in the year 2000?
 - c. Navigable waterways were there in the US in the year 2000?
 - d. Amtrak rail were there in the US in the year 2000?
3. How many fatalities occurred on our highways in 2000?
4. How many rail-related fatalities per million train miles occurred in 2000 in the US?
5. What is the Transportation Equity Act for the 21st Century (aka TEA 21)? Provide a brief description to submit
6. Obtain a picture of Interstate 10 and 79th Avenue in Phoenix Arizona
7. List 3 road construction projects taking place right now in St. Louis County
8. Obtain a map of all road construction projects taking place in St. Louis County
9. Find the following information about "Galloping Gertie" - a famous bridge in the state of Washington
 - Where was the bridge located?
 - What river did it span?
 - What caused it to collapse?
 - Obtain a picture of the bridge as it collapsed.
10. What president signed into law the interstate highway system and in what year?
11. How many miles was the system originally to include?
12. How much has it cost?
13. Explain the two types of interstate number systems that are used for numbering exits.
 - Which one does Missouri use?
14. Describe the Highway Trust Fund - its purpose, how it works, etc. Submit a brief description.
15. Who was Garrett A. Morgan?
 - What is he famous for?
 - Provide a brief biography of the man.

List of recommended sites:

BTS: Bureau of Transportation Statistics (www.bts.gov) -- use the search engine

<http://www.bts.gov/publications/nts/2002/index.html> q 1-4

FHWA: Federal Highway Administration (www.fhwa.dot.gov/)

ADOT: Arizona Dept of Transportation - Intelligent Transportation Systems site (www.azfms.com/)

MODOT: Missouri Dept of Transportation (<http://www.modot.state.mo.us>) - visit the Local Scene

MADSCI: MadSci Network (madsci.wustl.edu) - browse archives and search for Galloping Gertie

APPENDIX IV. Closing Banquet and Awards Ceremony

Banquet Program

Director's Award

FHWA Award

MoDOT Award

Outstanding Leadership Award

Exemplary Citizenship Award

Outstanding Authorship Award



**U.S. Dept. of
Transportation**

**SUMMER
TRANSPORTATION
INSTITUTE**

Closing Banquet
2004

**Friday, July 16, 2004
12:00 - 2:30 P.M.
University Center East**

Program

Welcome

- Opening RemarksMs. Lonnajeane Yoest
STI Director
- Greetings from the University of Missouri-Rolla Dr. Jerry Bayless
Associate Dean of Engineering
- Greetings from the Federal Highway Administration Mr. Allen Masuda
Missouri Division Administrator

Luncheon

- STI 2004 Reflections Slideshow Presented during Lunch

Award Presentations

- FHWA Certificates Mr. Allen Masuda
- Achievement Awards.....Ms. Lonnajeane Yoest
- Counselors' AwardsMr. Erick Webster, Lead Counselor
- Special RecognitionsMs. Lonnajeane Yoest

Closing

- Final Presentations..... STI Graduates
- Concluding RemarksMs. Lonnajeane Yoest

Graduates: UMR STI 2004

Ms. Ashley Ayuso

Ms. Sara Brandt

Ms. Annalee Embry

Ms. Ashley Escalera

Mr. Kevin Harris

Ms. Keshia Koehn

Mr. Rickey Leathers, Jr.

Mr. Alfred Massey, Jr.

Mr. Paul Nguyen

Mr. Steven Ramsey

Mr. William Russell

Mr. Todd Trabue

Mr. Caleb Trim

Mr. Clifton Washington

Mr. Aaron Yancey

Congratulations!

Advisory Board

Robert Berry

Burns & McDonnell

Sheila Bridges

Federal Aviation Administration

W. Floyd Harris

University of Missouri-Rolla, Minority Engineering Program

Sherrie Koechling-Andrae

Lincoln University

Allen Masuda

Federal Highway Administration, Missouri Division

Ron Moore

National Association of Black Engineers

Michael Shea

Missouri Dept. of Transportation, Research, Development & Technology

David Williams

Missouri Dept. of Transportation, Human Resources

Sponsors

University of Missouri-Rolla

Missouri Department of Transportation

Federal Highway Administration

Center for Infrastructure Engineering Studies

National Society of Black Engineers

Special Thanks

We would like to extend our sincerest gratitude to Dr. Gary Spring, Chair of Civil Engineering at Merrimack College in Massachusetts. It was his initiative that engendered STI at UMR and his guidance that helped us formulate the 2004 program.

UNIVERSITY OF MISSOURI-ROLLA

Summer
Transportation Institute

HONORS

Caleb Trim

WITH THE

Director's Award

*For displaying the highest degree of fine scholarship,
diligent service, and active participation.*

DIRECTOR

DATE

UNIVERSITY OF MISSOURI-ROLLA

Summer
Transportation Institute

HONORS

Paul Nguyen

WITH THE

FHWA Award

*For displaying a high degree of fine scholarship,
diligent service, and active participation.*

DIRECTOR

DATE

UNIVERSITY OF MISSOURI-ROLLA

Summer
Transportation Institute

HONORS

Sara Brandt

WITH THE

MoDOT Award

*For displaying notable scholarship,
service, and participation.*

DIRECTOR

DATE

UNIVERSITY OF MISSOURI-ROLLA
Summer
Transportation Institute

HONORS

Ashley Ayuso

FOR

Outstanding Leadership

*Utilizing personal drive and integrity to effectively engage
others to work collaboratively toward a unified goal.*

DIRECTOR

DATE

UNIVERSITY OF MISSOURI-ROLLA
Summer
Transportation Institute

HONORS

Alfred J. Massey, Jr.

FOR

Exemplary Citizenship

*In the form of service as a mentor and a friend to peers, helpfulness
to staff, and an excellent attitude in all activities.*

DIRECTOR

DATE

UNIVERSITY OF MISSOURI-ROLLA
Summer
Transportation Institute

HONORS

Ashley Escalera

FOR

Outstanding Authorship

*Demonstrating excellence in all areas of composition:
creativity, content, grammar and diction.*

DIRECTOR

DATE

APPENDIX V. Samples of Student Work

Papers: (3 examples of each)

- 1. Careers in Transportation and the Value of Diversity in the Workplace**
- 2. Transportation Modes and Their Impact on the Country**
- 3. George Washington Carver Research Paper**
- 4. Qualities of an Effective Leader**

Personal Mission Statement

Keshia Koehn
- STI 2004
Civil Engineering and Diversity Assignment

Mary-Lou: "So, Hakim, what are you going to do tomorrow? I know that I am really excited about going to the new highway construction site."

Hakim: "Yeah, I do enjoy working on the actual jobsite, but I think I get more enjoyment out of the road design process. You know, like calculating grade, curves, and the total costs of the materials and labor."

Mary-Lou: "Hmmm. I see your point. Every time I walk into the office and pick up the plans to give to the contractors, you and Shenequia seem to be enjoying yourselves."

Hakim: "Wow, come to think of it, just in this office alone there are several different ethnicities and cultures, all working on virtually the same projects."

Mary-Lou: "Come to think of it, that *is* true. But once you think about it, it benefits the company or corporation in more than one way."

Hakim: "I don't understand. What do you mean by 'benefit the company'? How?"

Mary-Lou: "What I mean is simply that the diverse population exposes the personnel to different cultures and

their way of life. The diversity also provides the company with the ability to be well-rounded with its staff and reputation. Finally, different ideas from different ethnic backgrounds help the employees find the best solutions for any problem that could arise."

Hakim: "Excellent! I never really thought about that. I do enjoy listening to the rainbow of cultures and the educational experience they have to offer. Wow, I guess I better get back to the drawing board. See you later!"

Mary-Lou: "Alright. I hope you have fun!"

Sara Brandt
Summer Transportation Institute
Writing Assignments

Bill: Rough day Fred?

Fred: Yah. We've got four trains running late by 15 minutes or more and a malfunctioning signal in LaSalle Street Station. How's yours?

Bill: Not bad. I got a college intern today.

Fred: Really? Who is it?

Bill: Her name is Diane; bright girl, good insight.

Fred: Yes? How so?

Bill: She immigrated to the United States from Germany, so she often tells me stories of the various forms of transportation over there. She's given me some good ideas for that new railway construction project I have.

Fred: It's always great to have a fresh perspective on things.

Bill: Most defiantly. If we kept proposing the same stale ideas, we wouldn't be making progress, but losing it.

Fred: Maybe I should request an intern so I can get some new ideas on how to control all of this railway traffic.

Bill: I would recommend it. It may help make our railways better than they have ever been before; everyone benefits then.

Learning A Lesson

By: Ashley Escalera

JULY 5 2004
Mrs yoest

There once was a man named Harry who didn't appreciate the values of transportation. Such a simple thing to understand, yet it became a nightmare for him. He learned his lesson the hard way when he met Mary, his best friend today. It all began at a café on a Tuesday morning, right as Harry was heading for work. Mary happened to be doing the same. The café was packed, and since the only empty table was Harry's, Mary approached him with great confidence and asked him if anyone was occupying the rest of the table. As the morning progressed, they started conversing.

Mary: So, what do you do for a living?

Harry: Well, right now, I am in public transportation.

Mary: Do you like what you do?

Harry: Not really, but because I dropped out of college, I don't have much of a choice. I hate my job, but it is the only thing I can do decently. All I do is drive people around on busses all day, and that hardly pays enough to provide for my necessities and wants. There really isn't anything much exciting that goes on during my typical work day, so I never look forward to having to go back the next day.

Mary: Have you ever thought about how rewarding your job could be, if only you took pride in what you do?

Harry: No, because I have done this job for seven years, and still haven't found anything just the smallest bit of a reward to me?

Mary: Well, let me explain it to you. Without people like you, who do the jobs that you do, for many people that means trouble. Many people can't afford a car, so they take busses. If there were no busses, or people to operate the busses, the people who can't afford a car, are now in the position of not having an easy access to get to their jobs. If these people can not get to their jobs, then they lose money; and if they lose money, then they can't afford their necessities or maybe even support their family. Ultimately, this can and most likely will lead to a lot of poverty stricken families who now have to beg on the side of the road for someone to have compassion for them, just because people like you don't really understand or care about how their job affects millions of people.

Harry: Well, I never really thought of it that way. Now that I think about it, my job really is rewarding. All it took was a person like you to change my life. Now I see how my job not only affects my life, but all of the other lives around me. Many people rely and depend on me to do my job

so that they can get to and from theirs. Thank you for enlightening me. I am going to start a new day and new life by taking pride in what I do so that I can enjoy my job and others can enjoy seeing me enjoy my job.

Afterwards, Harry went to work and enjoyed it for the first time. Harry and Mary dated for three years; then Harry proposed and they were later married. Harry and Mary had two kids: Sally and Molly. Together, they set up their own business and helped to improve customer service in public transportation. Their two kids followed in their footsteps and by age 35 they were multimillionaires. Everybody remembers their family name as the people who made "getting to work" something to look forward to.

America impacted by transportation!

In the past century America has been impacted by several different modes of transportation. We have come a long way in America in terms of transportation. Now there is a variety of ways to get where you want to go. The most popular way is automobiles and roadways. Every day millions of people use the highways to get around in their city and to travel to different cities. American citizens travel freely and somewhat effortlessly from state to state. In past years travel has been very slow, it would take months of a person's life to get from the Midwest to California. Now you can take a four hour flight. With the development of trains, businesses grew tremendously. Rail roads also serves as excellent public transportation in big cities. More modes of transportation led to more a more united, United States of America. On the other hand as more transportation became available, there was a lot more pollution. The price for easy transportation is the producing of poisonous exhaust. These exhaust fumes are leading to global warming which may be the one of the greatest impacts that transportation will make on America and the world.

Transportation Modes and Their Impact on the Country

"Magnetically Elevated Trains Sweep Market"

A newspaper article

By:

Caleb Trim

July 5, 2004

MAGNETICALLY ELEVATED TRAIN SWEEPS MARKET

The new magnetically elevated train is now the most popular mode of transportation to build. It was first tested in Taiwan on a thirty kilometer long track from the

capital, Taipei, to a city north of it. Now, MagEl tracks are being built in the United States.

The U.S. completed a MagEl line from New York City to Boston and tested their first train. The test results were outstanding. The MagEl train is much safer than previous passenger trains, as derailment is not an issue since the trains do not run on tracks, but are actually lifted a few inches in the air by powerful magnets. This also allows the train to have no friction at all, allowing it to go nearly fifty mph faster than the bullet train in Japan.

MagEl trains are now the biggest buy on the market. The cost to build these super trains is enormous, but the results are amazing. People can soon travel across the country in no time at all. Airplanes are still faster, but hopping on a train is much easier than the hassle of arranging a flight. A new, fast but safe way to travel is now available to the general public. Transportation in the U.S. will never be the same.

Annalee Embry

STI

7/6/04

**Transportation modes and their impact
on the country**

Today in America there are many different modes of transportation. The automobile is important to the movement of American's. For most, personal vehicles are the only practical way to travel within their community. The car has enabled cities to grow enormous without having an unbearable population density. Most Americans use their personal vehicles more than any other mode of transportation. Other important uses of vehicles in human transportation include public bus systems, the school bus, and the Taxi cab. Planes also play a vital role in transportation. When traveling long distances, many people fly on commercial airlines. Even with the added delays of security flying can often be much more efficient than driving or taking a boat. Because short trips to far away places have become so much easier, America has developed a much stronger national culture. Trains are still involved in the transportation of people. In large cities such as New York or Chicago, trains are at the center of public transportation. These trains make it possible for people who do not have access to a vehicle to around town. They also reduce congestion by pulling some of the commuters off of the roadways. In some parts of the country, trains also provide transportation between cities. Amtrak goes between

some of the major cities and offers an alternative to driving or flying.

George Washington Carver

Our Lives Will Never Be the Same



Research Paper

Caleb Trim

July 11, 2004

The American South needed more diversity in its agriculture. The cotton industry had become the sole product that people depended on. A new development was in demand.

His name was George Washington Carver. Carver became a hero to America for his hard and dedicated work, his development of the peanut, and for his outstanding skills at being a role model for everyone.

George Washington Carver was an African American agricultural chemist and experimenter. The actual date he was born is not known, but it was sometime in the early 1860's, during the Civil War. He was born to a slave woman in Diamond Grove, Missouri. Even though he became free after the war, he decided to stay on the plantation he was working on, and ended up becoming interested in plants and animals.¹

Carver eventually left the farm and went to get a secondary education. He attended Simpson College in Indianola, Iowa and studied art and piano. He gave up his passion in art to transfer to Iowa State Agricultural College, where he became the school's first African American student. There, he received a bachelor's degree in agricultural science, and a master of science degree. With this background education, George Washington Carver went out

¹ Brown, Mitchell C. "The Faces of Science: African Americans in the Sciences." <http://www.princeton.edu/~mcbrown/display/carver.html>. (July 8, 2004); Holt, Rackham. "Carver, George Washington." The New Encyclopedia Britannica, Vol. 2 Encyclopedia Britannica Inc. 2002

into the world and made a lasting impact in the agricultural society.²

At that time, the South had become dependent on cotton, but that crop depleted the soil and became a threat to farmers. Carver helped the economy by developing the peanut, the potato, and the soy bean. He worked hard to research these different products and found what he could make from these sources. He ended up developing 325 products from peanuts and 108 products from potatoes. Some of the synthetic products he developed are as follows: adhesives, cheese, dyes, ink, instant coffee, mayonnaise, shampoo, synthetic marble, and synthetic rubber. His outstanding work with the peanut had resulted in the peanut becoming one of the six leading crops in the United States.³

The United States' economy, especially in the South, was in need of an economic boost. Their hero was a creative African American man from a farm in Missouri. George Washington Carver worked with God's wonderful creation, nature, to develop numerous useful items that are still used to this day. He has become a roll model to every boy and girl, as one who works to the best of his ability, to make the lives of others around him special.

² Burchard, Peter Duncan. "George Washington Carver in Iowa: Preparation for life serving humanity." <http://www.gazetteonline.com/special/impact/imp021.htm>. (July 8, 2004); Holt, Rackham. "Carver, George Washington."

³ Brown, Mitchell C. <http://www.princeton.edu/~mcbrown/display/carver.html>. ; "George Washington Carver." <http://afgen.com/carver2.html>. (July 8, 2004)

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George Washington Carver was an incredible man. He made many accomplishments in the field of science for the world today. George Washington Carver made numerous discoveries with peanuts and hundreds more with soybeans, sweet potatoes, and pecans. He made hundreds of products using peanuts. These products are overwhelmingly used today. George Washington Carver's achievements made life easier and better for today society.

George Washington Carver was the son of slaves. At the time, nobody recorded his exact birth date. Historians believe that it is around July 12, 1861, or May 26, 1865, near Diamond Grove, Missouri. He was born during the United States' Civil War to Mary and an unknown father. Their slave owners were Moses and Susan Carver. During the Civil War, Mary and George were kidnapped. When the War ended, Moses and Susan were able to find George, but his mother was never to be found again. Moses and Susan adopted George and his brother as their children and they took the name Carver. As a child, George had a keep and inquiring mind. He also learned to love nature on the Carver's farm. This love for nature got him his nickname "The Plant Doctor."¹ At the age of ten, George left the Carvers' home to attend a one-room school at Neosho, Missouri. Through his hard work and help from benefactors, Carver was able to complete high school, in 1885, in Minneapolis, Kansas. After completing high

¹ "George Washington Carver," <http://inventors.about.com/library/weekly/aa041897.htm> (July 5, 2004).

school, Highland University refused to accept him because of his race. Not discouraged by this event, he applied and got accepted into Simpson College in Indianola, Iowa. Although his intended major was art, his professor saw his skill and interest in plants, so he told Carver to go into Agriculture. The following year, Carver attended the State Agricultural College in Ames, Iowa State University today. In 1894, he graduated with his bachelor's degree. He then worked at the Ames Experiment Station under Louis Pammel, a distinguished botanist and mycologist. In 1896, Carver received his master's degree in bacterial botany and agriculture from Ames and accepted the position as head of the Department of Agriculture at Tuskegee Institute in Alabama.²

When Carver came to Tuskegee Institute, he noted that the soil of the region had been totally exhausted. The farmers of the area were the only planting cotton in the area and caused the soil to lose all of its nutrients. He developed the system of crop rotation, which revolutionized the South's farmers. The crop rotation method was for farmers to alternate with nitrogen-producing plants, such as peanuts, sweet potatoes, peas, soybeans, and pecans, to replenish the soil. Carver noted that peanuts and sweet potatoes would thrive well in Alabama. Even though he taught

² "George Washington Carver," <http://inventors.about.com/library/weekly/aa041897.htm> (July 5, 2004). ; Foster, L. H. "Carver, George Washington." The Encyclopaedia Britannica. International ed. 2004. 746.

the farmers crop diversification, the world market found no use for their crops.³

To address this problem, Carver started to experiment with peanuts. Carver discovered three-hundred by-products of peanuts and sweet potatoes. He practically changed the South's economy through demonstrations of the commercial possibilities. Carver was able to make several dyes for textile factories. He made a total of five-hundred shades of dyes and stains. Even though he made many discoveries, he never patented or profited from most of his work. He freely gave all of his creations to mankind. He was also successful in making the south a multi-crop area. He said, "God gave them to me" and "How can I sell them to someone else?"⁴ Through this he became know as the "Peanut Man."⁵

The nickname originated from his love for peanuts. By 1914, Caver had focused his work on peanuts. In 1921, Carver received national attention for his speech in Congress. He made the speech in effort to promote peanuts. He tremendously loved his research in the field of agriculture. He had turned down jobs from people like Edison who were willing to pay him a high salary. Some jobs had offered him \$100,000 dollars a year, yet he could not be deferred from his love of research. A list of his discoveries from peanuts

³ Kitchens, W. John. "Carver, George Washington." The Encyclopedia Americana. International ed. 2004. 268-269.

⁴ "George Washington Carver," <http://inventors.about.com/library/weekly/aa041897.htm> (July 5, 2004).

⁵ Foster, L. H. "Carver, George Washington." The Encyclopeda Britannica. International ed. 2004. 747. ; "George Washington Carver," <http://inventors.about.com/library/weekly/aa041897.htm> (July 5, 2004).

include: adhesives, axle grease, bleach, buttermilk, chili sauce, fuel briquettes, ink, instant coffee, linoleum, mayonnaise, meat tenderizer, metal polish, paper, plastic, pavement, shaving cream, shoe polish, synthetic rubber, talcum powder and wood stain.⁶

George Washington Carver made many achievements and was well recognized. In 1916, he was named a fellow of the Royal Society of Arts of London. In 1923, the National Association for the Advancement of Colored People (NAACP) gave him the Spingarn Metal for agricultural chemistry. He later received the Theodore Roosevelt Medal for his contributions in science in 1939. In 1951, the George Washington Carver National Monument was built on 210 acres of farmland by Diamond Grove.⁷

George Washington Carver loved his research and work. He never cared for money or fortune because, in 1940, he gave away \$30,000 dollars of his life savings and his estate to the George Washington Carver Foundation. The foundation would allow people to continue all of his work and research after he died. George Washington Carver was never married because of his devotion to his work. He died on January 5, 1943. January 5th is used to honor Carver every year.⁸

George Washington Carver was an incredible man. He made many innovations within the field of botany, agriculture,

⁶ McMurry O. Linda. *George Washington Carver: Scientist & Symbol*. (New York: Oxford University Press, 1981), 219-230.

⁷ Foster, L. H. "Carver, George Washington." *The Encyclopaedia Britannica*. International ed. 2004. 747.

⁸ "George Washington Carver." http://www.galegroup.com/free_resources/bhm/bio/carver_g.htm. (July 9, 2004). ; Foster, L. H. "Carver, George Washington." *The Encyclopaedia Britannica*. International ed. 2004. 747.

and Chemurgy. He developed the industry for peanuts and made dynamic changes in farming with the development of crop rotation. His work allows us to have different colors of clothing. His work allows us to have many things easier then before. His work and achievements are still noted today and will continue to be noted in the future.

George Washington Carver

Ashley Escalera



http://encarta.msn.com/media_461515995_761574196_-1_1/George_Washington_Carver.html

Mrs. Yoest

July 12, 2004

George Washington Carver was an American educator as well as an agricultural science leader. Carver was born on July 12, 1864 in Diamond Grove, Missouri. Carver "usually named his father as a slave on a neighboring farm who was killed in a log-hauling accident" (McCurry par 3). His mother and he were both slaves on the Moses Carver farm. It is believed that Carver, (still an infant at the time), and his mother were kidnapped by night riders during the Civil War. Carver was found and traded back to the Moses Carver farm for a race horse. He developed whooping cough, which prevented him from having to do the hard labor the other slaves had to do. Instead, his chores were cooking and sewing. (George W. Carver et al pars).

Carver left the farm he was born on at the age of ten. He later moved to Minneapolis, Kansas, where he sought an education. In order to pay for his education, he worked as a cook, a farmhand, and as a laundry helper. After high-school, he applied for Highland University, but was denied because of the fact that he was black. At thirty years of age, he was accepted at Simpson College. To support himself, he ironed the clothes of his fellow students. In 1894, he graduated with a Bachelors Degree and in 1896 with a Masters Degree from Iowa State College of Agriculture and Mechanic Arts. He then

continued his studies and joined the college faculty specializing in bacteriological laboratory work in systematic botany. (McCurray par 1)

In 1896 he became director of the Department of Agricultural Research at Tuskegee Normal and Industrial Institute and began a series of experimentations with peanuts. He industrialized several hundred uses for peanuts, sweet potatoes, and soybeans as well as developing a new type of cotton, which is now known as "Carver's hybrid" (Carver par 2). He also developed soil quality improvement techniques and helped to educate southern farmers in more efficient agricultural methods using commercial crops other than cotton.

In 1935 he was appointed collaborator in the Division of Plant Mycology and Disease Survey of the Bureau of Plant Industry of the U.S. Department of Agriculture. For research in natural science, Carver donated all of his savings to the establishment of the George Washington Carver Foundation at Tuskegee in 1940.

By experimenting with agricultural products, he developed industrial applications from farm products, called chemurgy. Carver's research led to the development of seventy-five products from pecans, one-hundred and eight applications from

sweet potatoes, and three-hundred and twenty-five products derived from peanuts. His work in developing industrial applications from agricultural products resulted in 118 products. These products include a rubber substitute and about over 500 dyes and pigments that come from twenty-eight different plants. Carver invented a way to produce paints and stains from soybeans in 1927. Some of the synthetic products developed by George Washington Carver are: adhesives, bleach, cheese, dyes, ink, instant coffee, cream, insulating board, mayonnaise, the meat tenderizer, linoleum, buttermilk, metal polish, milk flakes, rubbing oils, paper, mucilage, milk flakes, soil conditioner, shampoo, shoe polish, sugar, vanishing cream, wood fillers, synthetic marble, shaving cream, Worcestershire Sauce, and many others. (McCurry par 5)

Carver's goal in life was "to make useful products, from common things." He died of anemia on January 5, 1943, at Tuskegee Institute. Until the day he died, he was, and still is a very simple, honest, caring, smart, and religious man. He had the courage and desire to persevere in life in order to achieve his goal, and at the same time, help others achieve theirs. He demonstrated this by encouraging other black people to work hard for what they wanted and to always do the best they can. He tried his best to make getting an education for

the younger generation easier than it was for him. (Carver par 3).

Some recognitions that Carver has received include July 14, 1943, when President Franklin D. Roosevelt dedicated thirty-thousand dollars (\$30,000) for a national monument to be built in honor of George Washington Carver as a token of appreciation for all of his accomplishments. In 1928, George Washington Carver was granted an honorary doctorate from Simpson College. He was also made a member of the Royal Society of Arts in London. In 1923, the National Association for the Advancement of Colored People awarded Carver with the Spingarn Medal. The Spingarn Medal is awarded to the black person who has made the greatest contribution to the advancement of his race. In 1943, Carver's birthplace was established as the George Washington Carver National Monument. (McCurray et al par)

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encarta.msn.com/encyclopedia_761574196/George_Washington_
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"Carver, George Washington," Microsoft® Encarta® Online
Encyclopedia 2004
<http://encarta.msn.com> © 1997-2004 Microsoft Corporation. All
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Qualities of an Effective Leader

Paul Nguyen
June 14, 2004



A Leader Never Dies

A leader is someone who is strong at controlling a group

A leader can work well with a group

A leader is the will of the group

A Leader never dies

A leader can speak well in public

A leader is not afraid to take risks

A leader is not afraid to direct

A leader never dies

A leader can affect change

A leader can affect people

A leader can affect a person's mind and opinion positively

A leader never dies

A leader has to be caring and understanding

A leader can not be offensive to others

A leader must learn to fail to succeed

A leader never dies

All these qualities make up a leader

Leaders do not lead, but only maintain a balance

That is why, when you ask me about a leader

A leader never dies....

Sara Brandt
Summer Transportation Institute
Writing Assignments

An effective leader must possess

The ability to not digress.

To push beyond the standards set

Yet make sure the important points are met.

They present ideas that are sure to work yet know

to accept others outside the status quo.

A leader presents these and other qualities

With distinct humility.

Todd Trabue

Summer Transportation Institute

July 14, 2004

Qualities of An Effective Leader

An effective leader has to be someone who inspires the confidence of the people he or she must lead. A perfect example of an effective leader is FDR. More than any legislation he asked Congress to pass, by talking to the nation in his "fireside chats," he gave the American people confidence in themselves and in the government. He was able to do this because he was willing to talk directly to the people in their time of need and was willing to work hard to help them achieve what was in both their and America's best interests. A good leader must be able to look at a situation and find options which can be pursued to provide answers. These answers must then be explained to the people who will be affected and then carried out. The ability to do this is what defines an effective leader.

MY

MISSION

Aaron J. Yancey

To strive each an everyday to be different

To fulfill my purpose

To not give in or up

To have a positive impact on people's lives

To be grateful

To always be humble

To read everyday

To speak Spanish fluently

To graduate from college

To support my family and the generations that follow

To travel around the world

To die a happy man with no regrets

“My Goal”

A poem by Caleb Trim

My personal goal is life:

To be like my Savior, Jesus Christ.

He died because he loved me so much

There is no other love like such

He taught me how to be a servant

And helped me defeat the serpent

All my cares, I cast onto Him

He is the One who will help me win

I will live for Him every day

And praise Him in every way

I have decided to give him my soul

Because to be like Him is my goal

My personal mission in life is rather simple, yet at the same time, it is rather complex, depending on how one chooses to interpret it/how well I explain it. At the surface, I would like to influence change to the best of my ability. I would like to see people treated equally, without regard to sexual orientation, gender (identity), race, ability, et cetera—and the only way to accomplish this is to do. I feel the world would be a much better place if people were more acceptant of other people and their relationships, whatever such acceptance might entail.

I want to learn and keep learning. I like learning. I might not show it, but I do, beneath the surface. I want to master the arts and sciences of linguistics and cryptology. I hope to better understand myself, and people in general... *What's going on up there?* It's a mystery to me, which I would like to achieve some understanding of. I will figure it out. Eventually.

Finally, I must remain true to myself, to what I believe in, all while maintaining an open mind.

All saints, all prophets, all stories, all story-tellers, all whores, all birds, all people who come out tonight to be heard, all women, all witches, all bitches, all trannies... No creation, no destruction. No creation, no destruction. We are all here, and we have always been here. No matter how the search ends. No matter how far it bends.

-- Searchlight

--Kevin Harris
12 July 2004

APPENDIX VI. Participants and Demographics

Participant Roster
Demographic Summary Sheet

2004 Summer Transportation Institute Student Roster

Last Name	First Name	Gender	Grade	Parent- LN	Parent-FN	Telephone (home)	Telephone (work)	City	State
Ayuso	Ashley	F	11th	Ayuso	Michelle	(314) 853-6641	(314) 509-0539	Florissant	MO
Brandt	Sara	F	10th	Brandt	William & Diane	(314) 781-7497		St. Louis	MO
Embry	Annalee	F	12th	Embry	Dale & Jane	(580) 765-5996	(580) 716-6588	Ponca City	OK
Escalera	Ashley	F	11th	Escalera	David & Hilda	(636) 933-6341	(314)206-2259	Herculaneum	MO
Harris	Kevin	M	11th	Harris	Wanda	(314)389-0727	(314) 935-7193	St. Louis	MO
Koehn	Keshia	F	12th	Head	Michele	(870) 426-5489	(417) 224-6135	Omaha	AR
Leathers Jr.	Rickey	M	12th	Leathers	Rickey & Maria	(816) 765-8774		Grandview	MO
Massey Jr.	Alfred	M	10th	Massey	Alfred & Princess	(816) 523-3941	(816) 289-1788	Kansas City	MO
Nguyen	Paul	M	11th	Nguyen	Loan & John	(225) 357-4477		Baton Rouge	LA
Ramsey	Steven	M	10th	Ramsey	Michael & Tina Rans	(816) 765-4040		Grandview	MO
Russell	William	M	11th	Russell	Steve	(417)724-1554	(417) 894-3199	Nixa	MO
Trabue	Todd	M	12th	Trabue	Thomas & Kimberly	(573) 445-5538	(573) 449-2683	Columbia	MO
Trim	Caleb	M	12th	Trim	Murray & Kathy	011-81-78-747-333		Kobe shi, Hyogo ke	Japan
Washington	Clifton	M	12th	Grossett	Kenneth & Carla	(847) 458-8775	(847) 271-3616	Algonquin	IL
Yancey	Aaron	M	12th	Yancey	Lester & Angela	(314) 839-4518	(314) 368-5481	Black Jack	MO

DEMOGRAPHIC SUMMARY SHEET

NAME OF HOST SITE: University of Missouri-Rolla YEAR REPORTING: 2004

DATES OF INSTITUTE: June 20 – July 16, 2004

PROGRAM CLASSIFICATION:

HIGH SCHOOL

MIDDLE SCHOOL

RESIDENTIAL PROGRAM

NONRESIDENTIAL PROGRAM

NUMBER OF APPLICANTS: 25

NUMBER OF PARTICIPANTS: 15

NUMBER COMPLETING PROGRAM: 15

ETHNIC BACKGROUND BY NUMBER:

0 NATIVE AMERICAN

6 CAUCASIAN

1 ASIAN

7 AFRICAN AMERICAN

1 HISPANIC

0 OTHER

GENDER:

10 MALE

5 FEMALE

GEOGRAPHIC REPRESENTATION:

NUMBER OF CITIES: 13

NUMBER OF STATES: 5

NUMBER OF COUNTIES: 10

NUMBER OF COUNTRIES: 2

GRADE LEVEL BY NUMBER:

TENTH: 3

ELEVENTH: 5

TWELFTH: 7

SCHOOLS REPRESENTED:

Arkansas School for Mathematics and Sciences	Hot Springs	AR
Dundee-Crown High School	Carpentersville	IL
Marist Brothers International School	Kobe shi, Hyogo ken	Japan
Scotlandville Magnet High School	Baton Rouge	LA

DEMOGRAPHIC SUMMARY SHEET

Crossroads High School	St. Louis	MO
Metro High School	St. Louis	MO
Southwest Charter	Kansas City	MO
Metro High School	St. Louis	MO
Festus R-6 High School	Festus	MO
Rock Bridge High School	Columbia	MO
Ruskin High School	Kansas City	MO
Nixa High School	Nixa	MO
Hazelwood Central High	St. Louis	MO
Oklahoma School of Science and Mathematics	Oklahoma City	MO
Ruskin High School	Kansas City	MO

APPENDIX VII. Evaluation Materials

Sample Evaluation Form

2004 Evaluation Form Results

Comparison of Evaluation Form Median Results for 2000-2004

Sample Pre-/Post-Test

“Rap Session” Results

UMR Summer Transportation Institute

Evaluation Form

Rating: Excellent = 5, Poor = 1

Speakers	Rating
Were well organized	
Provided academically challenging activities	
Responded well to questions	

Staff	
Were interested in my awareness of transportation careers	
Were helpful to me when I had problems	
Encouraged students to strive for academic excellence	
Were available for questions	
Were friendly and encouraging when I had difficulty	
Were knowledgeable on transportation-related careers	
Were enthusiastic about transportation-related careers	
Counselors were helpful	

Activities	
Project activities help students to better understand transportation careers	
Generally, enough time was allotted for project activities	
Enough time was allotted for audience participation	
Activities gave practical experience related to transportation	
Project activities included competition among groups	

Other	
Life in dormitory was fun	
Food in dining hall was delicious	
Number of speakers was appropriate	
Number of field trips was appropriate	
Number of projects was appropriate	
Evening activities were beneficial	
Sports/recreation activities were fun and worthwhile	

EVALUATION TABLE A: 2004 Evaluation Form Results

Speakers	MEAN	MEDIAN	MODE	SD
Were well organized	3.0	3	3	0.8
Provided academically challenging activities	2.9	3	2	1.0
Responded well to questions	3.9	4	5	1.1

Staff	MEAN	MEDIAN	MODE	SD
Were interested in my awareness of transportation careers	4.0	4	5	1.2
Were helpful to me when I had problems	4.5	5	5	0.9
Encouraged students to strive for academic excellence	4.3	5	5	0.9
Were available for questions	4.4	4	4	0.6
Were friendly and encouraging when I had difficulty	4.7	5	5	0.6
Were knowledgeable on transportation-related careers	4.2	5	5	1.0
Were enthusiastic about transportation-related careers	4.0	4	5	1.0
Counselors were helpful	4.8	5	5	0.5

Activities	MEAN	MEDIAN	MODE	SD
Project activities help students to better understand transportation careers	3.5	3	3	1.2
Generally, enough time was allotted for project activities	3.5	4	4	1.0
Enough time was allotted for audience participation	3.9	4	5	0.9
Activities gave practical experience related to transportation	3.4	4	4	1.0
Project activities included competition among groups	3.9	4	5	1.1

Other	MEAN	MEDIAN	MODE	SD
Life in dormitory was fun	4.1	5	5	1.1
Food in dining hall was delicious	2.4	2	3	1.1
Number of speakers was appropriate	2.7	2	2	1.0
Number of field trips was appropriate	3.7	4	4	1.3
Number of projects was appropriate	3.7	4	4	0.9
Evening activities were beneficial	3.6	4	3	1.1
Sports/recreation activities were fun and worthwhile	4.3	5	5	1.2

EVALUATION TABLE B: Comparison of Evaluation Form Median Values for 2000-2004

Speakers	Median				
	2000	2001	2002	2003	2004
Were well organized	4.0	3.5	3.0	4.0	3.0
Provided academically challenging activities	3.0	3.0	2.0	3.0	3.0
Responded well to questions	3.0	4.0	3.0	4.0	4.0

Staff					
Were interested in my awareness of transportation careers	4.0	4.0	3.0	3.0	4.0
Were helpful to me when I had problems	3.5	4.0	4.0	3.5	5.0
Encouraged students to strive for academic excellence	3.5	4.0	3.0	4.0	5.0
Were available for questions	4.0	4.0	3.0	4.0	4.0
Were friendly and encouraging when I had difficulty	3.5	4.0	4.0	3.0	5.0
Were knowledgeable on transportation-related careers	4.0	4.0	4.0	4.0	5.0
Were enthusiastic about transportation-related careers	4.0	4.0	4.0	3.5	4.0
Counselors were helpful	2.0	3.0	4.0	3.0	5.0

Activities					
Project activities help students to better understand transportation careers	3.5	4.0	3.0	4.0	3.0
Generally, enough time was allotted for project activities	4.0	4.0	3.0	4.0	4.0
Enough time was allotted for audience participation	3.0	4.0	3.0	4.0	4.0
Activities gave practical experience related to transportation	4.0	4.0	3.0	4.0	4.0
Project activities included competition among groups	3.5	3.0	4.0	5.0	4.0

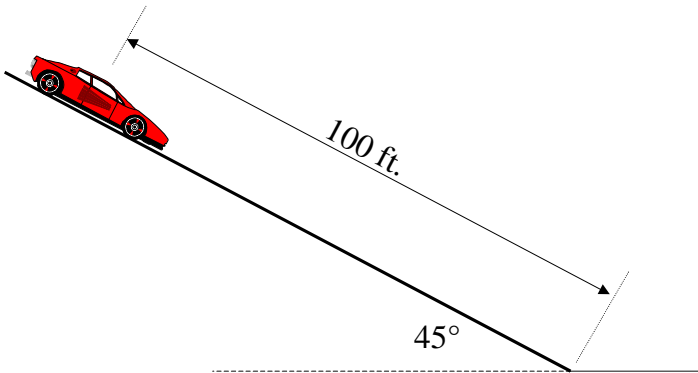
Other					
Life in dormitory was fun	3.0	3.0	4.0	4.0	5.0
Food in dining hall was delicious	3.0	2.0	2.0	1.5	2.0
Number of speakers was appropriate	3.0	4.0	3.0	4.0	2.0
Number of field trips was appropriate	4.0	3.5	4.0	4.0	4.0
Number of projects was appropriate	3.5	3.0	3.0	4.0	4.0
Evening activities were beneficial	3.0	3.0	3.0	3.0	4.0
Sports/recreation activities were fun and worthwhile	4.0	3.0	3.0	3.5	5.0

University of Missouri-Rolla
SUMMER TRANSPORTATION INSTITUTE
Pre-/Post-Test

1. Indicate which of the following career paths would not be considered as a transportation path.

	Planning
	Marketing
	Civil Engineering
	Computer science
	Business administration
	Logistics
	Electrical engineering
	All could be considered

2. Given a car sits on the incline shown below, find its velocity when it reaches the bottom of the incline.



3. Why do colleges want me to take the ACT?
4. Is it possible to pass or fail the ACT?
5. Is the ACT useful to me—or just to colleges?
6. Which of the following modes carries the most freight:

	Mode
	Highway
	Air
	Rail
	Water

7. Which of the following modes causes the least number of injuries and fatalities per year:

	Mode
	Highway
	Air
	Rail
	Water

8. A searchlight situated on a straight coast has a range of 43 mi. A ship sails on a line parallel to the coast and 15 mi. from it. What is the distance covered by the ship while it remains within range of the light? What angle is subtended at the light by a line connecting the extreme positions of the ship?

9. List steps that you should take in preparing for college.

10. What are your career goals?

11. Indicate the degree to which you have an interest in a career in transportation by circling the item that best describes your interest right now.

- a I am certain that I will follow a career in transportation
- b I am pretty sure that I will follow a career in transportation
- c I may follow a career in transportation
- d I am unsure
- e Probably not
- f Absolutely not!

12. Describe two fundamental purposes of surveying.

2004 STI “Rap Session” Results

Student Suggestions/Comments:

- Move Challenge Center activities to start of the program—good bonding experience.
- Move Lincoln University activities to start of the program—good team-building exercise.
- Allow/arrange for more history study time/review sessions.
- Emphasize need for lively presentations and “hands-on” activities to ALL speakers; limit usage of PowerPoint presentations.
- Need some unplanned free time during the day—activities were too close together.
- Add two 10-minute breaks to 3-hour evening history classes.
- Increase the time spent in Chicago.
- Increase the program to five weeks in residence (including weekends) and spread out field trips; allow for more relationship/bonding exercises to be planned over weekends.
- Eliminate two overlaps in curriculum—do not need to hear about aggregate at MoDOT when “hands-on” activity is already carried out at UMR; tour of Lambert expansion project was great but ABNA Engineering re-covered the project in their presentation.
- Include student mentors in program staffing.
- Speak to residence hall about inadequacies in linen service.

Counselor Suggestions/Comments:

- New behavior guidelines and emphasis of them to students/parents seem to have corrected disciplinary problems experienced in the past.
- Students need more “down-time.”
- It would be good if the present lead counselor could train next year’s upcoming lead counselor.
- Need to create a document of counselor knowledge base including possible recreational activities and examples of difficult situations faced along with corresponding resolutions.
- Having all counselors live in the dorms created a closer relationship between counselors and students, maintained an equity of this relationship from counselor to counselor thus maintaining an equity in counselor authority, and helped minimize problems of students not “getting along.”

APPENDIX VIII. Sponsors

2004 STI SPONSORS

The following provides a narrative description of the types of support provided by our partners. **Total approximate cost match is \$49099.**

University of Missouri-Rolla

Provided all overhead costs - approximately \$21,150 (see final budget for exact amount)

Center for Infrastructure Engineering Studies

Provided \$19,999 and hosted the group for an entire day, including 4-hour seminar and transportation to tours of bridge engineering projects in the area.

City of Springfield

Arranged and hosted an all-day field trip to tour the City's Traffic Management Center, its sign maintenance facility and a major highway construction project in the area. The City also provided lunch for 25. Approximate cost \$500.

ABNA Engineering (St. Louis)

Hosted the group at their downtown facility and arranged a field trip. Costs to them include preparation time from three to five engineers. Lunch was provided for 25. Approximate cost \$2,400.

Missouri Department of Transportation

Provided speakers for several sessions and hosted two field trips. This involved at least 15 different engineers at various levels spending anywhere from four to eight hours on the program. Approximate cost \$3,800

Federal Highway Administration

Hosted the group at the Missouri Division Headquarters and the Construction Prep Center in St. Louis. Additionally, they sent the Missouri Division Administrator to closing luncheon—costing from 4 to 8 hours of time for him. Approximate cost \$550

Chicago Regional Transportation Authority

Arranged for and hosted several activities for the Chicago trip. Approximate cost \$200

Federal Aviation Administration

FAA arranged for and hosted a tour of Columbia Airport; the City of Columbia provided its airport manager along with staff for that same tour. Approximate cost \$500.

Others

There are myriad others who travelled to Rolla or hosted the group for tours.

APPENDIX IX. Recruitment Materials

Brochure

Application

Sample Letter to High School Counselor

Sample Letter to Past STI Participant Counselor

Sample Letter to Former STI Participant

Sample Letter to Former STI Parents

Sample Letter to Prospective Student

Sample Letter to Prospective Parent

Sample Letter to Former STI Applicant



NATIONAL SUMMER TRANSPORTATION INSTITUTE
 Careers in Transportation • A Universe of Opportunity



UNIVERSITY OF MISSOURI-ROLLA



The Summer Transportation Institute is a four-week-long intensive program sponsored by the U.S. Department of Transportation, Missouri Department of Transportation and the University of Missouri-Rolla. The Institute seeks to aid in developing a diverse and robust workforce for the transportation industry by exposing 10th, 11th and 12th grade high school students to transportation careers.



SUMMER TRANSPORTATION INSTITUTE



The STI provides a broad array of opportunities for its participants including:

CLASSROOM ACTIVITIES — work in teams; learn key principles of a highly effective life; meet with transportation professionals from across the Midwest; develop communication and interview skills; learn good study habits; discuss the art and science of mathematical modeling; and earn four college credits transferable to any university in the country.

LABORATORY ACTIVITIES — build a magnetically levitated train and race it; design, build and test a highway crash cushion; design and test highway bridges; and learn about surveying methods.

FIELD TRIPS — an airline's pilot and staff Training Center, one of Missouri's Intelligent Transportation Systems Centers in Springfield, the 2nd largest intermodal facility in the United States in Chicago, Ill., one of the largest and most complex highway construction projects in the State of Missouri, the third largest trucking facility in the United States, Chicago's public transit operations center, and much more.

RECREATION — major league baseball game, science "magic show," ropes course, ice cream social by the pool, barbeques, access to UMR's full-featured fitness facility, golf course, tennis courts, and more.

web.umr.edu/~tranist/sti



ELIGIBILITY

- Rising 10th, 11th or 12th grade high school student
- 3.0 grade point average
- High school algebra

BENEFITS

- Worth approximately \$6,000
- Four college credits transferable to any university in the United States
 - Fees
 - Workshops and Handouts
 - Free room and board
 - Facility use, lab fees
 - Equipment and supplies
 - Text books
 - Travel (field trips — including a trip to Chicago and a stay at a Marriott Hotel)

explore and apply @ web.umn.edu/~tranist/sti

University of Missouri-Rolla
SUMMER TRANSPORTATION INSTITUTE (STI)
 Application for Summer 2004

Name:		
Social Security Number:	Gender:	
Address:		
Parent(s)/Guardian(s):		
Parent's Address (if different):		
Telephone (home):	Telephone (work):	
School you will attend in fall 2004:		
School Address:		
Guidance Counselor:		
Telephone:	Email:	
Grade during the 2004-2005 school year (circle one):		
10th	11th 12th	
Math and science classes for fall 2004:		
Math	Science	
Career Interest (Check one)		
<input type="checkbox"/> Accounting	<input type="checkbox"/> Environmental	<input type="checkbox"/> Engineering
<input type="checkbox"/> Architecture	<input type="checkbox"/> Law	<input type="checkbox"/> Technology
<input type="checkbox"/> Business	<input type="checkbox"/> Marketing	<input type="checkbox"/> Construction
<input type="checkbox"/> Criminal Justice	<input type="checkbox"/> Scientific Research	<input type="checkbox"/> Transportation
<input type="checkbox"/> Computer Science		
Essay:		
Describe your career objectives, your interest in transportation, and how the STI can assist you in reaching your goals. Your essay must be typed and can not be more than 1 page long.		
Checklist	Send completed application by April 15, 2004:	
<input type="checkbox"/> Completed Application	Lonnajean M. Yoest, Director	
<input type="checkbox"/> Essay	STI • UMR • 210 Butler-Carlton Hall	
<input type="checkbox"/> Letter of Recommendation from Counselor, Teacher, or Principal	Rolla, Missouri 65409	
<input type="checkbox"/> High School Transcript		



Lonnajeon M. Yoest, Director
Summer Transportation Institute

• • •
Missouri Local Transportation Resource Center
University of Missouri-Rolla
210 Butler-Carlton Hall
Rolla, Missouri 65409
• • •
umrsti@umr.edu

March 3, 2004

«Counselor»
«School»
«SchoolStreet»
«SchoolCity», «SchoolState» «SchoolZip»

Dear «Counselor»,

I am writing to ask your help in recruiting participants for the University of Missouri-Rolla Summer Transportation Institute.

This is a four-week-long intensive program sponsored by the U.S. Department of Transportation, Missouri Department of Transportation, and the University of Missouri-Rolla. The institute seeks to aid in developing a diverse and robust workforce for the transportation industry by exposing 10th, 11th and 12th graders to transportation careers and university life.

This year the program will run from June 20 to July 16. Enclosed, please find applications and brochures to distribute.

If you have any questions, please do not hesitate to call or email me.

I greatly appreciate your help in this endeavor.

Sincerely,

Lonnajeon Yoest, Director

Enclosures



Lonnajeon M. Yoest, Director
Summer Transportation Institute

• • •
Missouri Local Transportation Resource Center
University of Missouri-Rolla
210 Butler-Carlton Hall
Rolla, Missouri 65409
• • •
umrsti@umr.edu

March 3, 2004

«Counselor»
«School_Name»
«School_Address»
«School_City_State» «School_Zip»

Dear «Counselor»,

I am writing to ask your help in recruiting participants for the University of Missouri-Rolla Summer Transportation Institute.

This is a four-week-long intensive program sponsored by the U.S. Department of Transportation, Missouri Department of Transportation, and the University of Missouri-Rolla. The institute seeks to aid in developing a diverse and robust workforce for the transportation industry by exposing 10th, 11th and 12th graders to transportation careers and university life.

Last year, «Fname» «Lname» from your high school attended the STI program. We would appreciate your help in promoting the STI program to other students at «School_Name» this year.

This year the program will run from June 20 to July 16. Enclosed, please find applications and brochures to distribute.

If you have any questions, please do not hesitate to call or email me.

I greatly appreciate your help in this endeavor.

Sincerely,

Lonnajeon Yoest, Director

Enclosures



Lonnajeon M. Yoest, Director
Summer Transportation Institute

• • •
Missouri Local Transportation Resource Center
University of Missouri-Rolla
210 Butler-Carlton Hall
Rolla, Missouri 65409
• • •
umrsti@umr.edu

February 19, 2004

«Fname» «Lname»
«HomeStreet»
«HomeCity», «HomeState» «HomeZip»

Dear «Fname»,

I am writing to ask your help in recruiting participants for the 2004 University of Missouri-Rolla Summer Transportation Institute. Because you have attended a UMR STI in the past, you are in a great position to help identify students who would enjoy and succeed in the program.

This year STI will run from June 20th to July 16th. I have enclosed applications and brochures for you to distribute to any students you know that might be interested in attending.

Please help us spread the word!

Sincerely,

Lonnajeon Yoest, Director

Enclosures



Lonnajeon M. Yoest, Director
Summer Transportation Institute

• • •
Missouri Local Transportation Resource Center
University of Missouri-Rolla
210 Butler-Carlton Hall
Rolla, Missouri 65409
• • •
umrsti@umr.edu

March 15, 2004

«Parents» «Lname»
«Street_Address»
«City_State» «Zip»

Dear «Parents»,

I am writing to ask your help in recruiting participants for the University of Missouri-Rolla Summer Transportation Institute.

Your child, «Fname», attended the STI program in the past. We would appreciate your help in promoting the STI program to any qualified students you or your child might know. This year the program will run from June 20 to July 16. Enclosed, please find applications and brochures to distribute.

If you have any questions, please do not hesitate to call or email me.

I greatly appreciate your help in this endeavor.

Sincerely,

Lonnajeon Yoest, Director

Enclosures



Lonnajeon M. Yoest, Director
Summer Transportation Institute

• • •
Missouri Local Transportation Resource Center
University of Missouri-Rolla
210 Butler-Carlton Hall
Rolla, Missouri 65409
• • •
umrsti@umr.edu

February 19, 2004

<FirstName> <Last Name>
<Address>
<City>, <State> <Zip>

Dear <Mr./Miss> <LastName>:

We were pleased to learn of your interest in the UMR Summer Transportation Institute.

UMR STI is a four-week-long intensive program sponsored by the U.S. Department of Transportation, Missouri Department of Transportation, and the University of Missouri-Rolla. The institute seeks to aid in developing a diverse and robust workforce for the transportation industry by exposing high school students to transportation careers and university life.

This year the program will run from June 20 to July 16.

Enclosed please find a brochure and an application. Please do not hesitate to call or email us if you have any questions.

Sincerely,

Lonnajeon Yoest, Director

Enclosures



Lonnajeon M. Yoest, Director
Summer Transportation Institute

• • •
Missouri Local Transportation Resource Center
University of Missouri-Rolla
210 Butler-Carlton Hall
Rolla, Missouri 65409
• • •
umrsti@umr.edu

February 19, 2004

<FName> <LName>
<Address>
<City>, <State> <Zip>

Dear <Mr./Ms.> <LName>:

It was delightful to speak with you earlier today! I have enclosed a brochure and an application for our STI program, which will be held from June 20 through July 16 this year. If you know of others in your community who might be interested in attending, I would be happy to provide additional copies. Just let me know.

Please do not hesitate to call or email if you have any questions.

Sincerely,

Lonnajeon Yoest, Director

Enclosures



Lonnajeon M. Yoest, Director
Summer Transportation Institute

• • •
Missouri Local Transportation Resource Center
University of Missouri-Rolla
210 Butler-Carlton Hall
Rolla, Missouri 65409
• • •
umrsti@umr.edu

February 19, 2004

«Fname» «Lname»
«Street_Address»
«City_State» «Zip»

Dear «Fname»,

We are now accepting applications for the 2004 UMR Summer Transportation Institute. Because of your strong application and interest in the program last year, we encourage you to apply for this year's program.

This year the program will run from June 20 to July 16. Enclosed please find a brochure and an application.

Please do not hesitate to call or email us if you have any questions.

Sincerely,

Lonnajeon Yoest, Director

Enclosures

APPENDIX X. Preliminary Financial Report

2004 STI Preliminary Financial Report as of 10/14/04

	So Carolina Budget \$42,301	Actual Expenses 06/30/04	Actual Expenses 09/30/04	Pending 10/14/04	Transfers	Total	CIES Budget \$19,999	UMR Budget
Personnel								
Lonnajeon Yoest, Director	7,210	2,403.34	3,626.04	1,243.74		7,273.12		
Diana Ahmad, Course Instructor	2,729		4,630.60			4,630.60		
Erick Webster, Student Counselor	2,000		1,999.50	1,000.00		2,999.50		
Clarence Chaney, Student Counselor	2,000		1,999.50			1,999.50		
Claire Lehman, Student Counselor	2,000		1,999.50			1,999.50		
Chris Campbell, Student Counselor			662.25			662.25		
Fringe Benefits 27.63%	4,404	651.51	2,431.96	651.51		3,734.98		
Supplies								
Postage & Fed Ex	35	25.94	7.83			33.77		
Phone/Fax Charges	25		1.43			1.43	39	
Opening Picnic (required)	150	233.11				233.11	150	
Closing Banquet/Awards (required)	1,750		582.75			582.75		
Misc Printing/Copy work				30.29		30.29	200	
Award Plaques/prizes			79.36			79.36	200	
Certificates and frames			94.60			94.60	50	
T-shirts			134.90			134.90	250	
Other Misc, name tents, paper, etc	74	61.90	11.31			73.21		
Contractual								
Continuing Education Coordination	5,500			5,500.00		5,500.00		
Lincoln University Presentation	400					0.00	250	
Civitas Associates	250		250.00			250.00		
Universal Challenge Center \$35 x 20	675		450.00			450.00		
Travel								
4 Field Trips: 3 vans/trip x \$100/ea x 8 days	1,600	540.21	1,051.38	175.23		1,766.82	800	
Gas for vans: 8 days, 250 miles/day	800		222.24			222.24		
Misc. lunches on field trips			280.00			280.00	700	
Chicago Field Trip: 4 vans x \$100/ea x 4 days	1,600		1,165.84			1,165.84		
Chicago Field Trip: Housing, 10 rms, 2 nts	1,250		3,050.08		(1,250.00)	1,800.08	1,250	
Chicago Field Trip: Transportation System	200					0.00		
Other Misc. Dir/Staff Travel Expenses	1,750		658.85	1,025.19		1,684.04		
Tuition & Fees								
Student Material & insurance	2,210	949.44	128.55			1,077.99		
Supervisor Room & Board			920.90	222.22	(1,143.12)	0.00	2,468	
Student Room & Board	3,689		7,161.10	1,777.78	(5,397.76)	3,541.12	6,800	
Direct Cost	42,301	4,865.45	33,600.47	11,625.96	(7,790.88)	42,301.00	13,157	0
Indirect Costs - on-campus instruction 50%								21,150
Indirect Costs - 52%							6,842	
Grand total	42,301	4,865.45	33,600.47	11,625.96	(7,790.88)	42,301.00	19,999	21,150