
Final Report

Prepared by:

David B. Glick

David B. Glick and Associates, LLC

CTS 08-19
The Intelligent Transportation Systems (ITS) Institute at the University of Minnesota is developing materials for high school students in an effort to increase their awareness of transportation-related issues and careers. Five lesson plans were developed in early July 2008 and piloted during three of the four weeks of Exploring Careers in Engineering & Physical Science (ECEPS), a summer camp experience for high school students that is a program of the Institute of Technology Center for Educational Programs (ITCEP) at the University of Minnesota. Lesson plans were continuously modified during the summer camps based on feedback from surveys that were administered to students. The modifications were needed to help improve the lesson plans for future high school classroom use.

In addition, the lesson plans were piloted at Patrick Henry High School in Minneapolis, MN in October 2008. The lesson plans will be piloted at two additional high schools in the next several months; Anoka-Hennepin Secondary School in Anoka, MN and Maplewood High School in Maplewood, MN. The lesson plans were also presented at the Minnesota Science and Math Teachers Association in October 2008 to gain interest from teachers. Feedback from survey results and discussions with teachers, will allow for the implementation of new curriculum enhancements and designs for future transportation lessons.
Lessons for High School Students:
2008 Implementation and Evaluation Report

Final Report

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Table of Contents

Introduction..................................................................................................................................... 1
Methodology ................................................................................................................................... 2
Survey Results ................................................................................................................................ 3
Observations ................................................................................................................................... 9
Conclusion .................................................................................................................................... 13

Appendix A: Project Lead the Way Schools in Minnesota
Appendix B: Survey Comment Compilation

List of Tables

Table 1.1 Number of students enrolled in summer camps per week ................................................. 3

List of Figures

Figure 1.1. Student perspectives on the usefulness of the transportation studies activities .......... 4
Figure 1.2. How would you rate the difficulty of these activities? ...................................................... 4
Figure 1.3. How much would you say these activities were fun and interesting to you?.................... 5
Figure 1.4. Would you enjoy activities like these in your high school science classes? .................... 6
Figure 1.5. How would you rate the quality of the teacher of these activities? ................................ 6
Figure 1.6. Awareness of traffic engineering issues before and after activities ............................. 7
Figure 1.7. How did your participation in these activities affect the likelihood that you will pursue courses in traffic engineering? ................................................................. 8
Introduction

The Intelligent Transportation Systems (ITS) Institute at the University of Minnesota is a national University Transportation Center (UTC) funded through the Save, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) federal transportation bill passed in 2005. At the University, the program falls under the Center for Transportation Studies.

ITS is developing materials for high school students in an effort to increase high school students’ awareness of transportation-related issues and careers. Ultimately, ITS desires to increase the number of applicants to its programs and enrollments in its courses.

In the spring of 2008, ITS contracted with David B. Glick & Associates, LLC (DBGA) to develop classroom lessons for high school students based on the Traffic Control Game, an animated simulation developed by Chen-Fu Liao of ITS. DBGA developed five lessons and some additional activities that a teacher might wish to use to build upon the basic lessons. All lessons were developed with significant input from ITS staff, including Chen-Fu Liao, Shawn Haag and Stephanie Malinoff.

We piloted the lessons July 2008, during three of the four weeks of Exploring Careers in Engineering & Physical Science (ECEPS), a summer camp experience for high school students that is a program of the Institute of Technology Center for Educational Programs (ITCEP) at the University of Minnesota.

For the pilot, Shawn Haag and Stephanie Malinoff from the Institute taught the lessons. Prior to the camps, DBGA met with Shawn and Stephanie to walk through the lessons and ensure a reasonable level of comfort with their content and structure. We also decided on a tentative pairing of the lessons so that we could pilot as many lessons as possible while still allowing each group of students to experience Lesson 1, which provides an introductory experience.
Methodology

Lessons were piloted on Monday afternoons of each of the first three weeks of the ECEPS Summer Camp, July 7, 14 and 21, 2008. The sessions were from 1:00-3:30 and were the students’ last formal activities of the day. We used the Lind Hall 24 computer lab, which had more than enough computers for each student to have their own.

Before the camps began, we worked with the University’s technology department and with the ECEPS staff to ensure all computers had the software, connectivity, plug-ins, documents and permissions necessary. All components were installed and tested before students arrived on the first day of the camps. This preparation resulted in a minimum of technical glitches.

ECEPS structured the camp so that Weeks One and Three were for high school girls only. Each had 23 participants. Week Two consisted of a mixed group of boys and girls, with boys comprising a 71% majority of the 24 participants.

During Week One, Shawn taught Lessons 1 and Stephanie taught Lesson 2. During Week Two, Shawn taught Lesson 1 and Stephanie taught Lesson 3. During Week Three, Stephanie taught Lesson 1 and Shawn taught Lesson 4. I attended all lessons to observe and assist.

During the pilot phase, the lessons were continuously modified. Two particularly significant changes were made. After Week One, we modified Lesson 1 to be more student-centered and more flexible. We eliminated much of the scripting to improve the flow of the lesson and created an instructional worksheet so that students could work at their own pace without waiting for the teacher or their classmates. Shawn, the teacher for Lesson 1 in both Weeks One and Two, shifted his approach to allow more student control and pacing of the lesson. As a result, Week Two was much more successful as described more thoroughly below. Also based on what we learned from Lesson 1, Lesson 4 was revised significantly before it was taught on Week 3.

Following the lessons, students were asked to complete a 17-question online survey administered electronically. Questions useful for this evaluation were integrated in the general daily evaluation conducted by the camp. Only questions deemed relevant to this evaluation are included in this report.
Survey Results

In total, 70 students participated in the transportation lessons. Enrollment data is summarized in the table below. Week Two was unique for two primary reasons: the group was the only mixed-gender group by design of ECEPS and approximately one third of the group members were all from the same school. These students all took a bus together to the camp and clearly knew each other prior to attending the camp.

<table>
<thead>
<tr>
<th>Total Participants</th>
<th>Sophomores</th>
<th>Juniors</th>
<th>Seniors</th>
<th>Female</th>
<th>Male</th>
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<tr>
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<td>23</td>
<td>5</td>
<td>10</td>
<td>8</td>
<td>23</td>
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<td>24</td>
<td>5</td>
<td>9</td>
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<td>Week 3</td>
<td>23</td>
<td>8</td>
<td>10</td>
<td>5</td>
<td>23</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>70</strong></td>
<td><strong>18</strong></td>
<td><strong>29</strong></td>
<td><strong>23</strong></td>
<td><strong>53</strong></td>
</tr>
</tbody>
</table>

Students were asked to rate the usefulness of different components of the entire day as not useful, of limited use, moderately useful, useful and extremely useful. 33 of the 70 students (47%) rated the lessons useful or extremely useful. Only 10 of the 70 students (14%) rated the transportation studies lessons as not useful or of limited use. The group in Week Two, the mixed-gender group, rated the lessons less useful than the other groups. For that group, only 7 of the 24 students (29%) rated the lessons as useful or extremely useful, while 5 out of 24 (21%) rated the lessons as having limited use or not useful. Data from all three weeks and an overall average are provided in Figure 1.1 on the next page.

![Figure 1.1. Student perspectives on the usefulness of the transportation studies activities.](image)
Students rated the difficulty of the lessons as much too easy, too easy, about right, too hard or much too hard. Results for the three weeks are in Figure 1.2 below. Only one student over the three weeks rated the activities as too hard, and none rated them as much too hard. Although it appears that the changes made to the lessons over the three weeks resulted in a higher percentage of students rating the lessons as “about right,” it must be recognized that variations among the student groups may have caused or contributed to that trend. For all three of these groups of students, it is clear that increasing the difficulty of the activities would probably be well-tolerated.

![Figure 1.2. How would you rate the difficulty of these activities?](image)

Students were somewhat unenthusiastic about the engagement level of the activities. Only in Week Three did a majority of students indicate the activities were at least a little fun and interesting (Figure 1.3). This is the same group that rated the lessons’ difficulty as most appropriate. Written comments from the survey such as those below (edited slightly for clarity) provide additional insights.

The simulation was sort of shallow; I wish it was a bit more complicated and in-depth.
The game was extremely interesting. I'd like to find a more complex traffic control simulator after playing it.
Have activities more tailored to our level of education. The traffic signal game was somewhat insulting to our intelligence.
Make the activities more challenging.

This feedback suggests that we can increase the challenge level of the lessons and vary the lessons more substantially to increase the interest level. This guidance will be considered as the lessons are revised.
Seemingly paradoxically, students were more enthusiastic about wanting activities like these in their own high school classrooms (Figure 1.4). Overall, 67% of students say they would definitely or sometimes enjoy activities like these in their high school science classes. Only 4.3%, three students out of the 69 who answered this question, responded “no, definitely not.”

The strong trend exhibited in responses to this question over the three weeks is noteworthy. While the percentage of students answering in the positive (“yes, definitely” or “sometimes”) remained roughly constant, the portion of those that answered “yes, definitely” increased dramatically from Week One where it was 8.7% to Week Three where it was 31.8%.
Figure 1.4. Would you enjoy activities like these in your high school science classes?

Students were consistently very positive about the teaching of these activities, with an average of 90% rating the teaching as “good” or “excellent.” Only one student of the 70 total over three weeks rated the teaching as “poor” (Figure 1.5).

Figure 1.5. How would you rate the quality of the teacher of these activities?

The activities clearly had the desired effect of increasing awareness of transportation issues. The percentage of students rating their awareness of traffic issues as “high” or “very high” jumped from 21.44% before the activities to 91.48% after the activities (Figure 1.6). This jump was
roughly consistent among the three weeks, and only the three-week totals are included in the chart.

![Figure 1.6. Awareness of traffic engineering issues before and after activities.](image)

The impact of these activities on students’ plans to pursue courses in traffic engineering was far less dramatic. A minimum of 50% and an average of 58% of students indicated that these activities did not affect their level of interest in pursuing traffic engineering courses (Figure 1.7). Overall, the activities had only a slight positive effect, with 24.28% indicating they are more likely or much more likely to take such courses, while 17.13% indicated they are less likely or much less likely to do so. This data and some of the comments made in open-ended questions suggests upper-level high school students have already made many of their career-oriented decisions. As one student put it, “If I wasn't so set on my medical future, I would be more likely to investigate transportation engineering than [I was] before this class.” ITS might consider targeting a younger audience, perhaps fifth-ninth grade, to interest the students sooner.
Figure 1.7. How did your participation in these activities affect the likelihood that you will pursue courses in traffic engineering?
Observations

I observed the entire class session for all three days of the pilot in order to watch both how the lessons functioned as well as the teaching itself. As is normal and expected, both the lessons and the teaching improved over the course of the three weeks. The observations below are adapted from my notes and are intended to paint the picture of that improvement.

Week 1

1:10 pm. Students arrive. They each find a spot quickly and Stephanie starts promptly with good, relaxing chatter.


1:21. A little Internet browsing has begun while Stephanie talks.

1:23. Some good questions from the students about the technology examples (texting to parents) and the future of transportation studies. Most students engaged in discussion. Questions seem to relax Stephanie. Girls seem to appreciate the female engineer. Great role modeling.


1:35. Shawn directs students to game, which comes up immediately (tech-related preparations worked!). However, need a simpler link. Change long link to street.umn.edu for next week. Shawn gives students a few minutes to play. Game totally grabs them. Shawn still talking, but they’re focused on the game. Glitches discovered at game end & “exit game.”

1:40. Shawn tries to get them back with a pause. Not much luck. Acoustics in room are bad & it’s hard to hear in back when Shawn is at the front. Coach to teach from doorway/mid-room area.

1:42 Shawn demonstrates graphing feature.

1:45 Shawn trying to get small groups going while some kids still creating graphs. Difficulty getting their attention & orchestrating. Stephanie and I help out a little. Need better differentiation, individualization. For next time, write out activity instructions, set goals, and just let the kids go at it. Seems to have lost the structure of the activity and provided little closure. PI seems extraneous & confusing. Perhaps need to spend more time explaining it – or ignore it.

1:50 Stephanie starts Activity 2. Sooner than expected. Kids seem to be settling down a bit. Stephanie has good rapport with the girls. Shift from manual to fixed timing in the game is well done. Scientific method introduction a bit rushed. Needs better overview and more specific instructions for using the worksheet.

2:02 Worksheet for Activity 2 really helps get them doing. Need similar worksheet for Activity 1.
2:10 Students writing conclusions in worksheet. Students need instructional handout to understand the goals first.

2:14 Students finish writing conclusions. A little discussion to get to the “right” conclusion. Thought: often there isn’t a “right” conclusion. How do we structure the activity to get to that critical engineering concept?

2:25 Break

2:45 Students called back. Stephanie does introductions. Kids give names, school, year, interests. Nice move. Let’s do that at the beginning next time.


3:05. Walk outside for activity. Identify volunteers and explain activity. Some eye-rolling. As expected, seems a little juvenile, but it works. Did it produce the data we need? Seems like lots of downtime for a higher-than-desired number of kids.

3:12 Go back inside.

3:15 Low engagement, hard to get them to focus. Taste of beautiful summer outside did it. Stephanie collects and graphs data from activity. Very nice set of data. Point is made well. So yes, activity produced the necessary data. Is there a way to do that and make a more sophisticated activity? A few kids are very engaged. Many have clearly had enough. Stephanie asking some very good, deeper questions. We should get a list of those questions (with answers) for teachers.

3:20 More good questions from those few engaged students.

3:26 Wrap up; survey

Week 2

1:05 Shawn starts with introductions. About a third of students all from Austin, MN. Group is about two-thirds boys. Immediately obvious that the group dynamics are different.

1:10 Starts transportation overview. A little hard to hear.

1:18 Brief introduction to the lesson.

1:20 Shawn sets them loose with newly designed Lesson 1 and handout.

1:32 Students are already making graphs of their simulation runs. Clearly totally engaged, moving faster. Helping each other and talking productively. Good learning going on!

1:45 Shawn pulls them back together well. Talking from doorway/mid-room now. MUCH better sound. Brief discussion, then sets them back to it. Good. Effective.
2:05 Call for break. Many kids not wanting to stop. Eventually, the snack draws them out of the room. Several come back early to get back to activity.

2:18 All are back to work. Introduces offset and sets them to it with 10-minute warning.

2:31 Stop for brief discussion to wrap up. This went SO much better than last week. Shawn looks excited!

2:34 Stephanie takes over for Lesson 3. Introduces queue and other vocabulary & concepts. Nice wrap-up & move to richer content.

2:44 Kids largely disengaged. Too much teacher talking. Need less vocabulary, more student-centeredness. Make changes similar to Lesson 1 changes. Stephanie demonstrates spreadsheet and its function.

2:50 Students have time to experiment with spreadsheet. Stephanie trying to give more instruction after setting them loose. Students not listening. Students throwing in values, but without much (any?) thoughtfulness.

2:55 Stephanie directs them back to the game and describes using the game in tandem with the spreadsheet. Some confusion with the spreadsheet. Need to explain that only yellow cells should be changed; all else is calculated. Note: In final version, protect cells. Observed one student who cleverly copied the number/calculation column on the spreadsheet to multiple columns so that she could easily compare different scenarios. Smart! Build in a few columns to final version of spreadsheet with related activity.

3:07 Good classroom control. Good next-step question: “What isn’t taken into account in this simulation?” That wraps up Lesson 3. Went very quickly, but modeling Lesson 3 after new version of Lesson 1 will help slow it down and make it more meaningful. We’re on the right track.

3:10 Discussion on ITS career handbook and current ITS projects. Most students tuning out – a few still interested.

3:18 Wrap-up; survey.

Week 3

1:08 Stephanie does introductions – nice to have this at the beginning.

1:15 ITS overview

1:26 Stephanie introduces the game, then sets them to it.

1:32 They start with the game. Stephanie demonstrates the four pull-down menus.

1:34 All are engaged. Group is clearly more hesitant that Week 2’s group. More dependent on instructions. Seem to expect a teacher-led approach.
1:39 Stephanie gets them back to the handout & demonstrates how to pause, create graphs and make a screenshot. Students get right back to it. Clearly a quieter group. Little interaction between students. More handholding required.

1:48 One minute warning. Group much slower to experiment; interact. Structured discussion (pairs, small groups) would be beneficial here. Teacher questions need to be open-ended; not yes/no. Stephanie uses 1 x 1 fixed time graph to identify graph features. Effective. Need more pulling, less pushing of information. Good lead in to Activity 2. Not an easy group to do that with.

1:52 Sets them to Activity 2. Discover that the hypotheses and other answers were still in the document. Reminder: do “save as” with new name so each week students start with clean handout. Not a problem in a regular classroom. Easily solved problem, but a distraction.

2:12 Break

2:25 Stephanie describes offset and by 2:28, sets them to work on it. Very quiet group.

2:40 Good discussion of offset hypotheses & observations. Clearly engaged by the specificity here.

2:42 Shawn takes over for Lesson 4. Directs them to pull up handout; look at variables.

2:45 Sets clear goal: get the queue & delay as short as possible. Instructs them to change only one variable. Gives them good direction, but we need some examples of hypotheses for clarity.

2:50 Sets them to it.

3:10 Lots of students very engaged. Although quiet, higher level of expectation, greater specificity, more quantitative hypotheses all very helpful. Can we save Lesson 4 creations for student-generated data?

3:17 Some still working. Shawn gets a few volunteers to share hypotheses & results.

3:20 Wrap-up & survey
Conclusion

The ECEPS pilot served its purpose well in that it provided valuable information for improving the lessons and the teaching of those lessons. Both the observations and the surveys provided valuable feedback that we will consider as we revise the lessons. It is clear that increasing the level of difficulty, the variety and the pace of the activities will better target the audience of the camps.

However, significant differences exist between the camp and the typical high school classrooms for which the lessons are ultimately being created. The camp is made up of self-selected, college-bound students who have expressed a specific interest in science. As such, they are not average high school students. The Week Two group, which was mixed gender and partly from the same school, best approximates the typical high school science classroom.

For the camp, the lessons were taught by two people (Shawn and Stephanie) who are working with transportation concepts on a daily basis, and one of whom is an engineer. Teaching is a secondary activity to their daily work. The teachers who will ultimately bring these lessons to students are professional teachers, but will be largely unfamiliar with transportation concepts. These teachers will have prior experience with their particular students and will no doubt modify the lessons according to the student’s skill and interest levels. The more advanced enrichment activities provided in the lesson addendum may be more suitable for some classes, while the more basic activities piloted in the camps will no doubt be perfectly suitable for others. All these differences will be considered as the lessons are revised.

As the 2009-09 school year began, we intended to find several teachers who would use the lessons in their classrooms. That process has begun. A survey was distributed to 153 Project Lead the Way (PLTW) schools to find out their interest in implementing the lessons into their classrooms. PLTW, a nationwide pre-engineering program, has a substantial presence in Minnesota. A complete list of PLTW schools is included in Appendix I. The survey resulted in five responses. The lessons were tested at Patrick Henry High School in Minneapolis, MN on October 30 to a group of 21 students. The positive feedback from the teacher and students has resulted in the traffic curriculum being implemented into the teacher’s Project Lead the Way course. In addition, a proposal was submitted to present the simulation and lessons at the Minnesota Science Teachers Association (MNSTA) fall conference on October 17 and at the TIES 2008 Education Technology conference on December 9, one of the largest education technology gatherings in the Midwest. Both proposals were accepted. At the fall MNSTA conference, three teachers showed great enthusiasm with the lessons and simulation, and plan to implement the curriculum in some capacity in their schools. The A survey of school administrators designed to gauge interest in this curriculum will also help identify interested teachers and programs.

The lessons will continue to be tested and implemented in classrooms in November and December 2008. Feedback from the survey results and discussions with teachers, will allow for the implementation of new curriculum enhancements and designs for future transportation lessons.
Appendix A:
Project Lead the Way Schools in Minnesota
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<tr>
<th>School Name</th>
<th>City</th>
<th>Implemented</th>
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</thead>
<tbody>
<tr>
<td>Afrocentric</td>
<td>Minneapolis</td>
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<tr>
<td>Agricultural &amp; Food Sciences Academy</td>
<td>Vadnais Heights</td>
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<tr>
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<td>Albert Lea</td>
<td>2008</td>
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<td>Anoka</td>
<td>2004</td>
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<tr>
<td>Anthony Middle School</td>
<td>Minneapolis</td>
<td>2008</td>
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<tr>
<td>*<em>Apollo High School</em></td>
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<tr>
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<td>Plymouth</td>
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<tr>
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Survey Questions

The following questions comprised the survey distributed to and completed by all students at the end of the day. Questions include those designed by the ITCEP staff as well as those added for the purpose of this project. The surveys were distributed electronically. Although the version of the questions below does not duplicate the format in which the questions were presented, the content of the questions is accurately replicated.

1) The grade you will be in school next fall (check one)
   □ 10
   □ 11
   □ 12

2) Gender
   □ Male
   □ Female

3) How many years of the following topics had you taken prior to beginning ECEPS? (check all that apply)
   - High School Mathematics
   - High School Chemistry
   - High School Physics
   - High School Biology

4) Rate how useful you have found the following components of this program:

   - Introduction with TAs and Susan
   - U of MN Tour
   - Strong Interest Inventory
   - Transportation Studies

5) What worked well for you today?

6) What did not work well for you today?
7) The content today was:
☐ Very exciting and motivational
☐ Exciting and motivational
☐ Interesting and motivational
☐ Somewhat interesting and motivational
☐ Uninteresting

8) The content today was
☐ Appropriately balanced between theoretical/abstract material and applied content
☐ Too heavy on the abstract side
☐ Too heavy on the applied side

9) Before participating in these activities, how would you have described your awareness of traffic engineering issues?
☐ Very high
☐ High
☐ Low
☐ Very low

10) Before participating in these activities, how would you have described your awareness of traffic engineering careers?
☐ Very high
☐ High
☐ Low
☐ Very low

11) How would you rate the difficulty of these activities?
Much too easy
☐ Too easy
☐ About right
☐ Too hard
☐ Much too hard

12) How much would you say these activities were fun and interesting to you?
☐ Not much
☐ A little
☐ Some
☐ A great deal
13) How would you rate the quality of the teacher of these activities?
   - Excellent
   - Good
   - Fair
   - Poor

14) Would you enjoy activities like these in your high school science classes?
   - Yes, definitely
   - Sometimes
   - Not really
   - No, definitely not

15) After participating in these activities, how would you describe your awareness of traffic engineering issues?
   - Very high
   - High
   - Low
   - Very low

16) How did your participation in these activities affect the likelihood that you will pursue courses in traffic engineering?
   - I am now much more likely to pursue courses in traffic engineering
   - I am now more likely to pursue courses in traffic engineering
   - These activities did not affect my level of interest in pursuing courses in traffic engineering.
   - I am now less likely to pursue courses in traffic engineering.
   - I am now much less likely to pursue courses in traffic engineering.

17) Do you have any suggestions for improving these activities or any other comments you’d like to add about these activities or traffic engineering?
Appendix B:
Survey Comment Compilation
How many years of the following topics had you taken prior to beginning ECEPS?
Other (please specify)

physical science 1 year (3)
one year of physics/chemistry (2)
My Honors science course was 9th grade chemistry and physics combined. It was a one semester course.
Earth Science

Computer Science
1 year physical science (4) 
chem and physics only 1 semester
UMTYMP through Calculus 3, Honors Science 9
Umtymp up to calc II
science 9 and UMTYMP through calc 1

Earth Science
1 yr Physical Science (3)
UMTYMP, Earth Science
1 Semester of Physics and 1 Semester of Chemistry (2)

Rate how useful you have found the following components of this program:

i think the tour should be made optional for those who hope to attend the U of M and others can just meet the group afterward.
Emily Oaks was a great tour guide.
I wish that on the tour that we could have seen a dorm room and would have liked to seen a classroom and more of the interiors of some of the buildings
Emily Oaks, the tour guide, was very interesting and gave a good tour. She also was very good at walking backward! Put in a good word for her, please.
I thought the Transportation studies were interesting but I am not interested in them as a career so I didnt think learning about them was as valuable as a career I have interest in.
I'm not interested in transportation studies but learned many interesting facts.

have already done college tour
I would have liked a more general start that most people in the group could be interested in.
Tour was fun but long
not interested in transportation studies
I like playing ultimate frisbee

Helped eliminate a possible career
A little bit too much time was spend on the transportation studies simulation
Tour felt like a waste of time.
I really like the strong intrest inventory. It was interesting to be shown what careers fit my intrests
I didn't think that the Transportation speech was that interesting or important.
The instructors at the 2nd Transportation Studies event covered lots of the same general job
information (which took 1/2 hr to give...) and it got boring. Maybe some coordination would
help?
Transportation was really different from what I was expecting. I really enjoyed learning about
the complexities of designing traffic routes.
I really enjoyed the tour of the campus. It was probably the activity I enjoyed most all day! The
strong interest inventory I found not only interesting but very helpful, especially for vocational
and academic decisions.

What worked well for you today?

The presentation about Transportation Studies was helpful because we got to talk to more than
one individual, we talked to four.
i think the strong interest inventory test worked well and was very interesting
getting to know the group and the capus
Everything! All the TAs and Susan were kind and willing to help me any time I was in need.
Getting to know every body in class and seeing the different job possibilities available.
having many different people presenting their histories so that I may ask questions.
the computer traffic game and the outdoor simulation were helpful because we didn't lose
interest because it wasn't just talking.
The campus tour was very informative.
I thought that the tour was very useful and i also enjoyed learning about the strong interest
inventory.
I liked the tour and the guides. It was fun and helpful and the guides were friendly and nice.
I thought that the strong interest inventory was very beneficial to exploring careers.
I liked learning about the traffic engineering because I like to see what other careers are under
the engineering field.
More than just telling what job is- explanation of duties and such.
I enjoyed the tour - it gave me a better understanding of what it's like to live on campus. The
strong interest inventory was very helpful and really lays out my options for me.
The tour and the lessons were very interesting.
I Really liked the strong intrest inventory, it really gave a lot of information and told me
somethings that I should think about for careers.
the way the tour showed me a view of the campus
I really enjoyed the transportation study. I thought it was very interesting to know the science
behind traffic and all the different components that have to be considered in order to reduce
build-up. I also enjoyed the tour. It really made me feel at home here at the U.
I liked how all the TA's welcomed any questions we had. Also I liked getting to know them as
people.
Everything went really well today. My favorite was the career survey results and the tour of the
campus to learn more about the buildings.

The transportation simulation tour and inventory (and ultimate frisbee)
The game was extremely interesting, I'd like to find a more complex traffic control simulator
after playing it.
Everything today seemed to flow smoothly, and everyone was nice and willing to help.

the tour
Most everything.
The simulation
The tour
the tour and interest survey
the transportation simulation
The tour went well and so did the Strong Interest Inventory evaluation sheets.
the transportation simulation was interesting, the lunch was good
The tour worked well.
The simulation that we did was pretty easy to use and made the topic easier to understand.
Every TA, tour guide, and presenter was very friendly.
I liked the traffic simulation
Simulations of traffic control and the tour of the campus
I enjoyed the interest survey. It included a lot of very interesting data I will enjoy looking over. I also enjoyed the tour the University of Minnesota campus. Lunch was also very good.
going around the campus
the tour of U of MN
i really enjoyed the tour
Strong Interest Inventory
Strong interest inventory

I liked seeing my strong interest inventory survey results.
I really liked the tour and the career speakers
The tour was helpful
The U of MN tour was very informative about college life.
The tour worked very well for me today.
The interest inventory was interesting, and I liked lunch. ^_^
I liked walking around the U of M for a tour! It made me excited to be on campus!
Lunch was good and the transportation studies was very interesting.
The campus tour was enjoyable and the lunch was delicious!
I enjoyed being able to use the scientific method to come up with my own experiments, because it gave me free reign to use problem-solving skills etc.
I like the Strong Interest Inventory.
I THINK EVERY THINK WORKED.
I thought the traffic computer work was really interesting.
Understanding the game in transportation and how it is incorporated in a real life scale.
I liked hearing about the jobs our civil engineering speakers talked about. I found it interesting to learn about how engineering is applied to our lives and environment.
that i understood the game about transportation
Learning about transportation studies was very interesting and gave me a new respect for people who work in that field and the different challenging aspects of their jobs.
The campus tour, introductions, and SII explanations worked well.
I thought the tour was awesome- our tour guide was really good
The activity and the tour and being outside on a nice day.
Everything, I thought, worked well. Nothing on my computer shut off or failed to log on/link to
anything, and, on a personal level, I really enjoyed today. The tour, the career exploration, and the traffic control activities all went well.

What did not work well for you today?

lunch didn't work very well, I think there should be more options besides sandwiches if you are not interested in the topic of the day...you get super bored. The number of venue changes during the day. the name game at the beginning was not helpful because it was so rushed. All in all, it was a good day and I liked all of it. I think you should provide water at the beginning of the day, instead of in the middle at lunch. Everything worked well!
I found the traffic stuff kind of boring, but that's a personal opinion. I thought that the lesson about transportation studies was slightly frustrating because of the different levels of comprehension throughout the group of girls. The campus tour was not great for me because I had already been on one at the U of M and it was exactly the same. But it was a nice tour. How does science come into these things? They told us about transportation and the careers available but did not provide an adequate explanation of the science and math used in that field. I don't really have a keen interest in transportation studies. It was a good experience to learn more about what these people do, but I don't really think it's for me. It was so hot in one room. The transportation studies was okay, it just doesn't interest me that much. the people did a very good job of presenting and the information was enough to give me a taste of that particular career.
nothing big
Everything went smoothly.
Everything worked smooth.
The hot weather and the long ramps, nothing much that I would complain.

The long orientation
game thing on computer
The session with the traffic game was a little long.
Learning about transportation was not of great importance.
Nothing.
The lectures and walking.
Nothing
Some of the transportation game that we did.
Eating lunch on lecture hall desks was uncomfortable.

having to sit at a computer all day
waiting times and traffic lectures post-lunch
the simulation was sort of shallow, wish it was a bit more complicated and indepth. the tour was very repetitive for me, already seen all the stuff.
The transportation studies didn't interest me very much. I have no desire to be an engineer who
specializes in transportation.
the transportation computer experiments
sitting on the computer for a couple of hours kind of wore me out
Lunch
transportation studies was long

The transportation studies got a little boring after awhile
Transportation studies simulation and learning how to use the scientific method
The transportation studies with the directions were a little hard to follow at times.
The tour.
Having a snack so close to lunch time.
I don't know anybody.
I was tried so my attention was easily lost- even if i was wide awake i think my attention could have been better kept.
I think today generally worked well
I had trouble following the directions that were given for the transportation simulation, but i thought it was fun to experiment with it.
NOTHING
I arrived at the Northup Turnaround, but I couldn't find anyone. They were all sitting hidden from the street.
the career panel
I thought the traffic simulations got a little bit boring after awhile.
the lecture about transporation because i get things better if it is hands on
Some parts of the tour didn't really seem to apply, mostly all of the buildings and names of places, that dont really have anything to do with this camp...but it did give me alot of information about college life for the future. Also the traffic simulation activities were a bit monotonous at times
The transportation simulations did not work so well. I have an appreciation for the people that program traffic lights, because it is not that easy!
I did not like the length of the 2nd transportation lecture. Even though we were able to use the simulation and it was interactive, I still thought it was a little boring, particularly the intro.
I would have liked the transportation activity to be a little more structured, It was a little confusing at first.
Everything went fine for me.
Nothing troubled me too much.

Do you have any suggestions for improving these activities or any other comments you'd like to add about these activities or traffic engineering?

A better overview of many different careers in Traffic Engineering would have been nice and more educational.
No (6)
make the lessons more interesting by increasing student involvement

The online game was a good way to show how the system works and what they are looking to improve.
Have activities more tailored to our level of education. The traffic signal game was somewhat insulting to our intelligence.
Make the activities more challenging.
I thought it was an interesting topic we don't normally get to discuss in school.
Focus the activities on more challenging material
I think it was a good topic to discuss because it helped better my understanding of engineering fields and what goals engineers work towards.
Incorporate an explanation of how science is used in traffic engineering instead of just telling what it is.
I think you should talk about a few more types of engineering instead of just one of them.
I think more hands-on learning experiences would help maintain interest in traffic engineering.
I liked learning about these things but they aren't that interesting to me. I learned a lot that I didn't know before.
I thought that this was an interesting topic to explore, as it isn't really something we discuss on a daily basis.
I would like to participate in more simulations to better understand traffic engineering.
I think it just had to with interests
I really like learning about traffic lights because i did not know much about them before.
They are one of the things that you ask how does that work?

A more in-depth look at the simulation's calculations
No (12)
I'm just not interested in traffic engineering
These activities were interesting and from these, I learned more about traffic engineering.
make it more complicated
don't start with traffic engineering.
It was very fun!!
I'm not too interested in traffic engineering but I wish we would have talked more about bridges. That would've been a little more interesting.
Have us watch real intersections and see the traffic engineering at work.
Need to advance to a slightly more complex situation
I would say go into more detail about different aspects of the career. The simulation was fun, but eventually became boring. More information would make the information on the specific career more interesting.
Could have been more exciting

No (7)
A little more explanation before begining
Have the directions for the activities be a little more explained.
Please change the activities for traffic engineering, playing the simulation game for 3
hours was very boring and much too easy for high school students interested in transportation engineering.
You repeated a question. (4 and 9)
There should be a lot more information and difficulty on the traffic simulation and some more free time on the game.
Using a site that was more complex and gave more options and variables.
We maybe could have only done 2 of the traffic simulations. Three got a little long.

Explain more the transportation and help broaden what they actually do instead of simulating
I believe they should move the traffic engineering day to maybe not the first day. It's kind of a random start to the camp.
Explain more about what else a traffic engineer does.
The computer simulations got a little repetative.
I think it good and I had fun.
maybe some other transportation activities besides the traffic simulation
The game was really helpful. It made traffic interesting.
The game was fun, but step by step verbal instruction got tiring (we already know what a hypothesis and conclusion are...)
I don't have any suggestions, but I will say that I believe, if I wasn't so set on my medical future, I would be more likely to investigate transportation egineering than before this class

B-7