

Increasing Diversity through Partnerships  
For a Summer Transportation Institute

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## **ABSTRACT**

In partnership with the Upward Bound Program (UB) at the University of Vermont (UVM), which is funded by a US Department of Education grant, the UVM Transportation Research Center (TRC) served as the coordinating and hosting entity for the 2008 Summer Transportation Institute (STI), funded by FHWA. 20 high school students from Greater Burlington, Vermont (population 140,000 in a state of 620,000) participated in this four week residential program.

Ten of these students were English as a Second Language (ESL) students. For some of these students English was their third or fourth language. 80% were not born in the United States and represented eight different countries. They ranged in age from 14 to 18 years and included students from 8 different countries. 90% were non-white, non-native born and 75% were female. Reaching underserved and underrepresented communities is a key goal of workforce development initiatives broadly within the US DOT.

The synergy of the relationship between UB and the UVM TRC with the addition of the Young Writers Project (YWP) and strong support from the Vermont Agency of Transportation (VTrans) are at the core of this program. The partnership with UB, the inclusion of a large percentage of ESL students and using the YWP and its on-line writing element enabled a more diverse group of students to participate in the STI.

## **INTRODUCTION**

15 years ago the first STI was held on the campus of South Carolina University with the goal of attracting youth into the transportation industry. The goal remains as important today as we look at the demographic forecast. We know that there are not enough potential transportation workers to meet the needs of tomorrow. The Summer Transportation Institute is one way to increase awareness of the transportation industry to help meet the need for the transportation workers of tomorrow.

This paper will describe the program and the evaluation conducted of the program.

## **PROGRAM DESCRIPTION**

The four weeks of the STI included core academics, math, English (provided by the Young Writers Project), ESL, ASL and SAT preparation, recreational opportunities, team building and diversity awareness training in addition to the Transportation themed speakers and field trips.

The students were divided into two math groups; Roads (geometry) and Bridges (algebra). These groupings held for the English portion as well. 50% of the kids took part in ESL while the other half took American Sign Language (ASL) as foreign language component. Rising juniors who were not ESL students took part in SAT prep. Evening Town Halls enabled the students and the Tutor/Counselors to discuss issues from the day and provided a forum for dialogue and team building.

### **Upward Bound (UB)**

All students were recruited and selected by Upward Bound. The criteria for inclusion in the program were:

1. The student's family income.
2. Being the first generation in his/her family to aspire to go to college.

The year round structure of Upward Bound adds a quantifiable depth to this program. The Summer Transportation Institute focused on 4 weeks of programming; however, there is a year round level of outreach and contact with the students through our partnership with UB. UB is a post secondary education preparatory program that focuses on academics using a holistic, well-being approach. The program provides enrichment classes, tutoring, counseling and career planning.

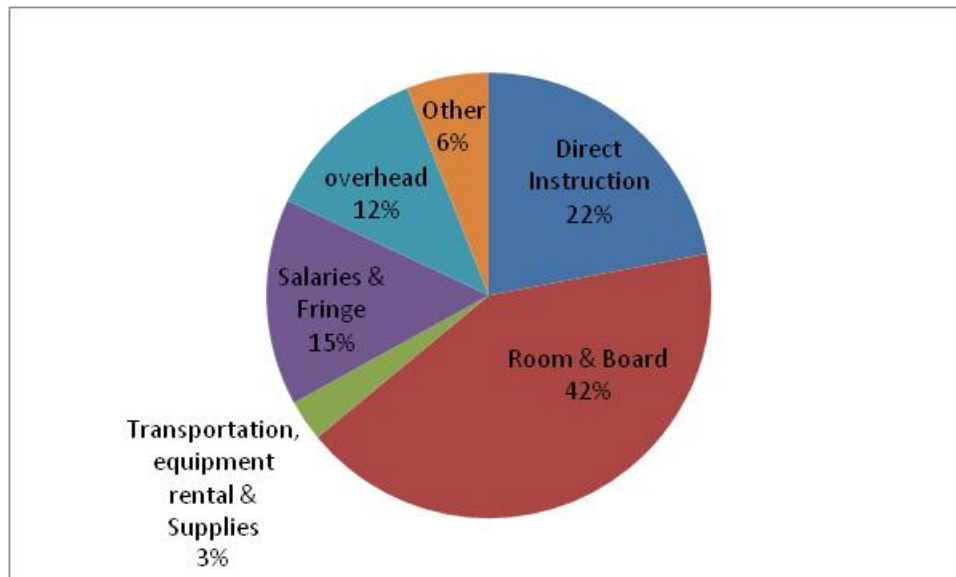
There are four main components to UB:

1. Summer College
2. School visits
3. Saturday College
4. College Tour

It is during the 6 week Summer College portion of UB that the 4 week Summer Transportation Institute is held.

## Budget

By combining funding from UB of \$46,484 from the US Department of Education with the NSTI budget of \$45,844 from FHWA through the Vermont Agency of Transportation a four week residential program with field and lab work as well as participation in the Young Writers Project was possible. As shown in figure 1, Faculty and Tutor/Counselor salary accounted for 22 % of the total budget. Food and housing accounted for 42% of the combined UB and NSTI budgets. Note – the food costs were entirely borne by the UB grant. 3% of the total budget was used for transportation, equipment rental and supplies. The total budget also includes costs for the 5<sup>th</sup> week of the UB Summer College that is not directly related to the NSTI.



**FIGURE 1 NSTI and UB Summer College Budget**

## Students

The twenty students selected for the STI presented a unique perspective. As table 1 shows only 4 of the 20 students were native born Americans. 50% of the native born Americans were Caucasian. This means that 90% of the participants were non-white, non-native born Americans. 75% of the students were female.

**TABLE 1 Student Breakdown by Country of Origin**

	Somalia	Kenya	Congo	Russia	Bosnia	Vietnam	China	Dominican Republic	USA
Country of Origin	4	1	2	1	1	5	1	1	4

In one of their first writing projects they were asked to tell their story. Their stories provide a moving insight into their views of transportation and the role of civil government. From fleeing war zones, to UN refugee camps, to arriving in the US and finally to Vermont these children have experienced a life quite unfamiliar to and quite distinctive from native born Vermonters. Vermont's population is 96.7% white, 0.7% black, 1.4% Asian, 1.1 Hispanic or Latino origin and 3.8% foreign born.

One student wrote of fleeing Somalia, through Tanzania and people dying on the road and being eaten by hyenas. Another student wrote about the first time he saw blue eyes. Yet another wrote about being told his family's name was on the UN Board, meaning they were to receive passage to the United States.

The students writing not only vividly exposed the hardships of their lives but also showed the challenges of communicating with new immigrants and assessing comprehension and the effectiveness of the program. Working with these students required us to re-think our basic assumptions about rising 10<sup>th</sup> through 12<sup>th</sup> graders. For instance, students arriving from refugee camps had not learned basic keyboarding skills. To view the students stories go to <http://ywpvt.net/upwardbound/>

The students ranged in age from 14 to 18 years. The students were all rising sophomores and juniors.

### **Integrated thematic curriculum**

The local, regional and global transportation systems are vital to community, the economy, and economic development. Transportation policies impact the environment, energy, culture, equitable mobility between regions and groups, as well as overall quality of life. Critical transportation issues and problems in the 21st century will require innovative solutions. The UVM Transportation Research Center worked with Upward Bound to create a holistic, dynamic and relevant curriculum for their students. Each week of the 4 week institute was focused on a different transportation theme. The curriculum was integrated to assure maximum impact. For instance the students wrote about the transportation field trip and speakers through the Young Writers Project. Embedding transportation within the curriculum gave it added depth and texture.

**Week One: Mass Transit.** Students heard from the General Manager of the regional transit provider CCTA, the Aviation Director of the Burlington International Airport and the President of the Lake Champlain Transportation Company, the region's ferry system. The students went

on a field trip to the Vermont Air National Guard. Their writings about this field trip and the speakers revealed gender differences among the refugee population. One student wrote,

“Jets never really appealed to me because being a girl, I really never paid attention to war crafts, airplanes, and whatnot. But whenever I'm bored I would usually read my brother's books he got from school about F-16 and jets. When we went to the trip to VTANG I wasn't really excited that much. But when we got there it was really interesting.”

Another student was inspired by meeting a female engineer and wrote,

“Not much woman works in the army base. (name deleted) is Caucasian who is twenty-six years old and has a four years old. ...It was an honor to meet her because she is an engineer. It makes me very proud and gives me some great confident of being what ever I want to do because she and I have shared the same gender.”

The group wrote extensively about the machinery and equipment and recalled details about the engines, their cost, their manufacturer and the thrust power each required for takeoff.

“In the jet engine shop there were 2 power plants with 2 Pratt Whitneys. The newer Pratt Whitneys have 6000 more thrust. To rebuild an engine it would take 2-3 people working 10 hours a day on it. Installing a new engine would take 2-3 hours with 2-3 man crew. 24000-27000 pounds of thrust.”

One student was inspired about a possible career choice in aviation and wrote,

“I'm thinking about doing Avionics or mechanic. Why this was important to me is because i may possibly go in to this because i like working with my hands, I'm kind of good at math and I'm kinda good at science and that's all the qualities you need to have for those possible career choses.”

One ESL student who did not have the vocabulary to describe a speaker as a military person described him as “the shooter.” This perspective of the military speaks to the writers background and experience in a war zone.

The full schedule for this week is shown in Table 2.

#### **TABLE 2 Week One Schedule**

	16-Jun	17-Jun	18-Jun	19-Jun	20-Jun
Time	Monday	Tuesday	Wednesday	Thursday	Friday
	<b>Mass Transit Week</b>				
7:00 - 7:50a.m.	Breakfast	Breakfast	Breakfast	Breakfast	Breakfast
8:00 - 8:50 a.m.	Opening Ceremony (8:00-8:30) Full Group English (8:30-9:10) Full Group Math (9:15-9:55)	Traffic Control English/ Alternative Transport Math	Traffic Control English/ Alternative Transport Math	Traffic Control English/ Alternative Transport Math	Traffic Control and Alternative Transport English
9:00 - 9:50 a.m.		Traffic Control Math/ Alternative Transport English	Traffic Control Math/ Alternative Transport English	Traffic Control Math/ Alternative Transport English	Community Service
10:00 - 10:50 a.m.	ESL / SAT Prep	ASL / SAT Prep	ESL / SAT Prep	ASL / SAT Prep	
11:00 - 11:50 a.m.	VTrans Speaker Chris Cole - CCTA	VTrans Speaker Brian Searles - BTV Airport	Field Trip To the Airport and National Guard	VTrans Speaker Trev Pecor - LCT	
12:00 - 12:50 p.m.	Lunch	Lunch		Lunch	
1:00 - 2:45 p.m.	Speak Up! Erin Baker	Handshake Activity w/ Diane		Gender Roles Erin Baker and Keith Smith	
3:00 - 5:00 p.m.	Town Hall (3-3:30)/ Study Hall	Study Hall	Town Hall (3-3:30)/ Study Hall	Study Hall	Leave for home by 3:30 pm
5:15 p.m.	Dinner	Dinner	Dinner	Dinner	Sunday Check-In: 7 p.m.
6:00 - 6:45 p.m.	<b>FREE TIME</b>	<b>FREE TIME</b>	<b>FREE TIME</b>	<b>FREE TIME</b>	
7:00 - 9:00 p.m.	<del>TC LED ACTIVITIES</del>	Robert Nash Moral Conversation	<del>TC LED ACTIVITIES</del>	<del>TC LED ACTIVITIES</del>	
9:00 - 10:00 p.m.	Return to Floor	Return to Floor/ Floor Meeting	Return to Floor	Return to Floor	
10:00 p.m.	Residence Hall Free Time (Must Check in w/ TC)	Residence Hall Free Time (Must Check in w/ TC)	Residence Hall Free Time (Must Check in w/ TC)	Residence Hall Free Time (Must Check in w/ TC)	
11:00 p.m.	In room/Lights Out	In room/Lights Out	In room/Lights Out	In room/Lights Out	

**Week Two: Energy and the Environment.** Students explored the environmental impacts of our transportation system and alternative fuels. They wrote about the environment. They heard from *Local Motion*, the region’s bicycle and pedestrian advocacy group, the President of Green Mountain Car Share, and a UVM graduate student whose work is focused on the connection between energy the environment and transportation. They conducted emissions testing with UVM graduate students, conducted a hydrogen demonstration with a UVM professor, went on a bike trip to the Hydrogen re-fueling station and got to ride in a hydrogen powered vehicle.

The students wrote about their experience on the bike ride and their visit to the hydrogen re-fueling station. They were clearly intrigued by the use of “rocket fuel” for the hydrogen car and rejoiced in the opportunity to go for a bike ride. The universality of this mode of transportation was apparent as all 20 students were able to ride a bike. The students created connections between walking and bicycling for transportation and public health.

“I learned that in 1970, seventy percent of kids (our parents)walked to school. Now, 35 years later, only 13% walked to school. I didn't know that only that much walk to school, it makes you wanna tell everyone to walk. Some of the things caused by not getting any kind of exercise are not healthy,obese and less energy. “

Another student connected walking and biking to supporting a vital community.

“I learned that in this century we have been riding a lot more cars which can be bad for the enviroment, depending on what fuel you use. We should also start finding other was of transportation instead of cars. By doing that it could make the community more cohesive.”

The full schedule for the week is shown in Table 3.

**TABLE 3 Week 2 Schedule**

	23-Jun	24-Jun	25-Jun	26-Jun	27-Jun
Time	Monday	Tuesday	Wednesday	Thursday	Friday
	<b>Energy and the Environment Week</b>				
7:00 - 7:50a.m.	Breakfast	Breakfast	Breakfast	Breakfast	Breakfast
8:00 - 8:50 a.m.	Traffic Control English/ Alternative Transport Math	Traffic Control English/ Alternative Transport Math	Traffic Control English/ Alternative Transport Math	Traffic Control English/ Alternative Transport Math	Traffic Control and Alternative Transport English
9:00 - 9:50 a.m.	Traffic Control Math/ Alternative Transport English	Traffic Control Math/ Alternative Transport English	Traffic Control Math/ Alternative Transport English	Traffic Control Math/ Alternative Transport English	Community Service
10:00 - 10:50 a.m.	ESL / SAT Prep	ASL / SAT Prep	ESL / SAT Prep	ASL / SAT Prep	
11:00 - 11:50 a.m.	VTrans Speaker Annie Borden - UVM	VTrans Speaker Todd Taylor/Chapin - Local Motion	Bike Trip with Chapin To the Hydrogen Refueling Station (Rain Back-Up McNeil Plant)	VTrans Speaker Elaine Wang - UVM	
12:00 - 12:50 p.m.	Lunch	Lunch		Lunch	
1:00 - 2:45 p.m.	Hydrogen Demo	Emissions Testing - Perkins Lab Tucker Stevens and Damon Lane	Town Hall (3-3:30)/ Study Hall	VTrans Speaker	
3:00 - 5:00 p.m.	Town Hall (3-3:30)/ Study Hall	Study Hall		Study Hall	Leave for home by 3:30 pm
5:15 p.m.	Dinner	Dinner	Dinner	Dinner	
6:00 - 6:45 p.m.	<b>FREE TIME</b>	<b>FREE TIME</b>	<b>FREE TIME</b>	<b>FREE TIME</b>	
7:00 - 9:00 p.m.	<b>TC LED ACTIVITIES</b>	<b>Seminar Night</b>	<b>TC LED ACTIVITIES</b>	<b>TC LED ACTIVITIES</b>	Sunday Check-In: 7 p.m.
9:00 - 10:00 p.m.	Return to Floor	Return to Floor/ Floor Meeting	Return to Floor	Return to Floor	
10:00 p.m.	Residence Hall Free Time (Must Check in w/ TC)	Residence Hall Free Time (Must Check in w/ TC)	Residence Hall Free Time (Must Check in w/ TC)	Residence Hall Free Time (Must Check in w/ TC)	
11:00 p.m.	In room/Lights Out	In room/Lights Out	In room/Lights Out	In room/Lights Out	

**Week Three: Safety.** Students explored transportation safety from the designer and driver perspective. They heard from the head of Highway Research at the Vermont Agency of Transportation, traffic engineers from a private consulting firm, and the chief of the Vermont Department of Motor Vehicle Safety. They conducted traffic counts and then using Synchro put together a traffic simulation. The field trip included a mock crash, the Seat Belt Convincer and using “drunk goggles” to simulate driving and walking drunk.

Although several of them were of age, none of the students had their driver’s license. One student experienced her first driving experience on the field trip.


“Today was my first time driving a CAR!!!! The feeling from this experience was indescribable. I only had my permit but I didn’t know how to drive. I don’t think driving was safe because I learned that alot of people killed in fatal car accidents because their fault or others in the road.”

Knowing that many of these students would soon be driving we felt it critical to stress driving safety. It appears the message sunk in with at least one author who wrote,

“Because of the experience from DMV, now I will be more careful when I drive and got to learn how to drive.”

The full schedule for week 3 is shown in Table 3.

**TABLE 4 Week Three Schedule**

	30-Jun	1-Jul	2-Jul	3-Jul	4-Jul
Time	Monday	Tuesday	Wednesday	Thursday	Friday
	<b>Safety Week</b>				
7:00 - 7:50a.m.	Breakfast	Breakfast	Breakfast	Breakfast	
8:00 - 8:50 a.m.	Traffic Control English/ Alternative Transport Math	Traffic Control English/ Alternative Transport Math	Traffic Control English/ Alternative Transport Math	Traffic Control English/ Alternative Transport Math	
9:00 - 9:50 a.m.	Traffic Control Math/ Alternative Transport English	Traffic Control Math/ Alternative Transport English	Traffic Control Math/ Alternative Transport English	Traffic Control Math/ Alternative Transport English	
10:00 - 10:50 a.m.	ESL / SAT Prep	ASL / SAT Prep	ESL / SAT Prep	ASL / SAT Prep	
11:00 - 11:50 a.m.	VTrans Speaker Mary Spicer - VTrans	VTrans Speaker Corinne Reynolds - VTrans	Field Trip with Jake from the DMV	VTrans Speaker UVM EMT's ?	
12:00 - 12:50 p.m.	Lunch	Lunch		Lunch	
1:00 - 2:45 p.m.	Traffic Simulation - Votey 246 Bob Chamberlain and/or Erica	Traffic Simulation - Votey 246 Bob Chamberlain and/or Erica		LEAVE FOR HOME!	
3:00 - 5:00 p.m.	Town Hall (3-3:30)/ Study Hall	Study Hall			
5:15 p.m.	Dinner	Dinner	Dinner		
6:00 - 6:45 p.m.	FREE TIME	FREE TIME	FREE TIME		
7:00 - 9:00 p.m.	TC LED ACTIVITIES	Seminar Night	TC LED ACTIVITIES		
9:00 - 10:00 p.m.	Return to Floor	Return to Floor/ Floor Meeting	Return to Floor		
10:00 p.m.	Residence Hall Free Time (Must Check in w/ TC)	Residence Hall Free Time (Must Check in w/ TC)	Residence Hall Free Time (Must Check in w/ TC)		
11:00 p.m.	In room/Lights Out	In room/Lights Out	In room/Lights Out		

**Week Four: Bridge building and Pavement.** Students learned about the considerations that are used in determining how and where to build or rehabilitate a new bridge and they learned about the various aspects of pavement. They heard from a variety of speakers and conducted a field and lab study of porous pavement and an active bridge construction site. The bridge site also featured a railroad museum and bike path.

The students designed and built a bridge out of candy using knowledge they gained from the speakers and field trip. Each student was given a bag of the same food supplies. Prizes were award for most creative, structural, functional, edible and overall.

The full schedule for week four is found in table 5.

**TABLE 5 Week Four Schedule**

	7-Jul	8-Jul	9-Jul	10-Jul	11-Jul
Time	Monday	Tuesday	Wednesday	Thursday	Friday
	<b>Bridge Building and Pavement Week</b>				
7:00 - 7:50a.m.	Breakfast	Breakfast	Breakfast	Breakfast	
8:00 - 8:50 a.m.	Traffic Control English/ Alternative Transport Math	Traffic Control English/ Alternative Transport Math	Traffic Control English/ Alternative Transport Math	Traffic Control English/ Alternative Transport Math	<b>GRADUATION!</b>
9:00 - 9:50 a.m.	Traffic Control Math/ Alternative Transport English	Traffic Control Math/ Alternative Transport English	Traffic Control Math/ Alternative Transport English	Traffic Control Math/ Alternative Transport English	Community Service
10:00 - 10:50 a.m.	ESL / SAT Prep	ASL / SAT Prep	ESL / SAT Prep	ASL / SAT Prep	
11:00 - 11:50 a.m.	VTrans Speaker Jennifer Fitch - VTrans	VTrans Speaker Mike Fowler - VTrans	Field Trip to Swanton	VTrans Speaker Carolyn Carlson - AOT	
12:00 - 12:50 p.m.	Lunch	Lunch		Lunch	
1:00 - 2:45 p.m.	Lab/ Tech Work w/ Jennifer Fitch	Dr. Mandar Dewoolker Votev Lab		Bridge Building w/ Carolyn	
3:00 - 5:00 p.m.	Town Hall (3-3:30)/ Study Hall	Study Hall	Town Hall (3-3:30)/ Study Hall	Study Hall	Leave for home by 3:30 pm
5:15 p.m.	Dinner	Dinner	Dinner	Dinner	
6:00 - 6:45 p.m.	FREE TIME	FREE TIME	FREE TIME	FREE TIME	
7:00 - 9:00 p.m.	TC LED ACTIVITIES	Seminar Night	TC LED ACTIVITIES	TC LED ACTIVITIES	Sunday Check-In: 7 p.m.
9:00 - 10:00 p.m.	Return to Floor	Return to Floor/ Floor Meeting	Return to Floor	Return to Floor	
10:00 p.m.	Residence Hall Free Time (Must Check in w/ TC)	Residence Hall Free Time (Must Check in w/ TC)	Residence Hall Free Time (Must Check in w/ TC)	Residence Hall Free Time (Must Check in w/ TC)	
11:00 p.m.	In room/Lights Out	In room/Lights Out	In room/Lights Out	In room/Lights Out	



## **Instructors**

The academic component of the program included writing, math, ESL course, ASL language study and SAT prep work. Instructors included a current high school teacher, a graduate student, UB staff and the director of the Young Writers Project (YWP).

## **Young Writers Project (YWP)**

The vision of the YWP is to operate a safe, respectful online community where young writers share ideas, comment on each other's work, learn from mentors and professionals and connect with the world.

According to YWP they believe that:

- Students can learn to write well.
- The Web is a comfortable place for students to write.
  - The prospect of being published motivates students to try harder, learn more and write better.
- Receiving objective, positive feedback helps young writers gain confidence and grow; giving feedback improves critical thinking.
- Students at risk need special attention.
- Young people want voice.

By including the YWP students were able to express themselves through writing, using on-line blogs. They commented on each other's writing and will be able to continue writing and reading through the on-line site created for this program.

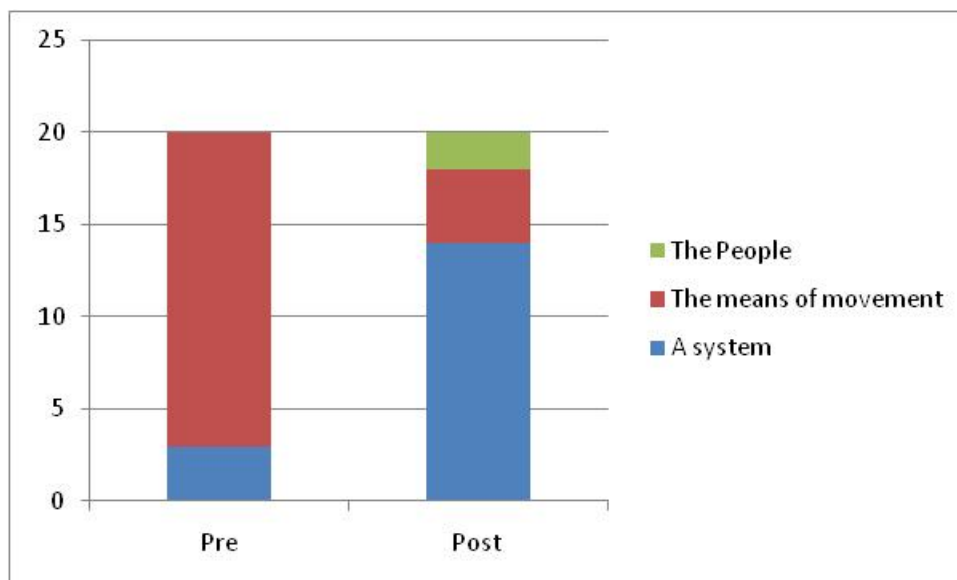
## **EVALUATION**

Both quantitative and qualitative evaluations were conducted of the program. The evaluations looked at change in the students' perception of transportation and their views on the programs. Students received pre and post evaluations to measure the effectiveness of the program and to judge their views on the transportation sector. The quantitative measures used a four-point scale from Strongly Agree; Agree; Disagree; to Strongly Disagree. There was no neutral option provided. For the qualitative evaluations the students were asked four open ended questions.

1. What is transportation?
2. What are the problems with our transportation system?
3. What are the potential solutions to our transportation problems?
4. What type of people work in the transportation industry?

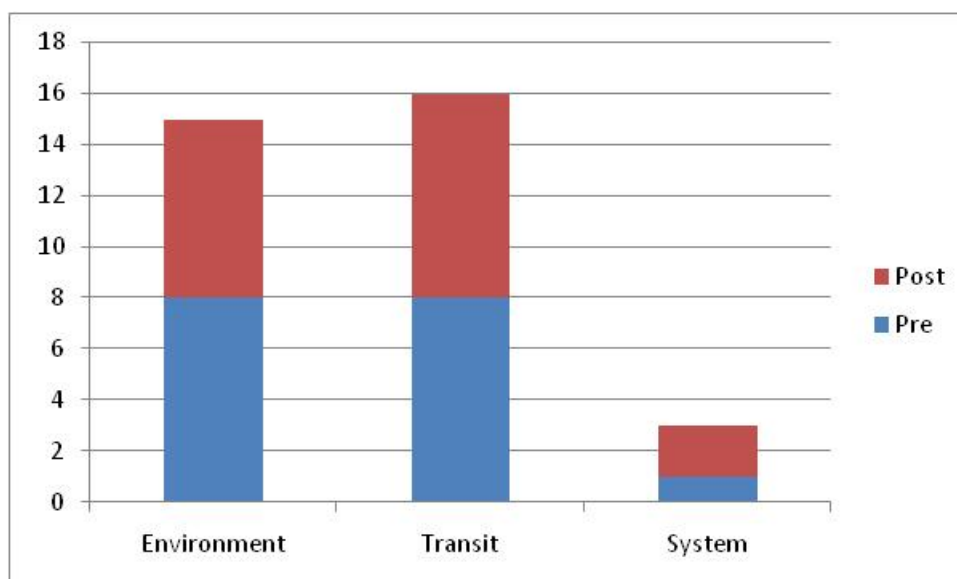
By reading the full transcripts of responses to the pre and post survey themes were distilled using keyword searches. Responses using these keywords were then coded and the totals tallied.

All the students writing were available through their on-line blogs. The students' initial responses to the question "what is transportation?" were focused on the means of transport. 14 respondents mentioned cars, planes, or busses, 3 mentioned walking and 3 mentioned the general concept of moving from point A to point B. The post survey responses showed 14 respondents mentioning the larger concept that transportation is about the system of moving people and goods. 4 respondents mentioned the vehicles and 2 mentioned the people who run the system. As shown in figure 2 the change in perspective from the means of movement to a system of movement is dramatic.



**FIGURE 2 What is Transportation?**

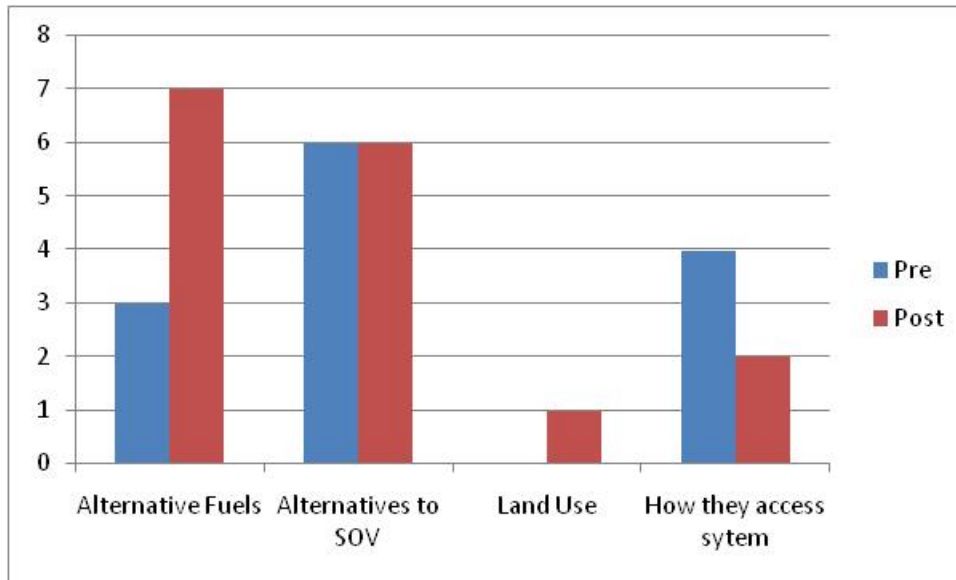
In response to the second question, What are the problems with our transportation system, 8 of the respondents in the pre-survey responded with comments about busses, 8 responded with concerns about the environment, 1 felt the problem was lack of access to a car and 1 responded with concerns about the overall system and its impact on land use and health. The post survey showed 7 concerned with the environment, 8 concerned with the lack of transit and 2 concerned with the overall system, land use and the budget to maintain the system. While the categories of their concerns did not shift much during the four weeks the quality and depth of their comments did. As shown in figure 3, the pre-survey responses reflected more of their personal interactions with the transit system while the post-survey responses were more about the transit system.



**FIGURE 3 What are the problems with our transportation system?**

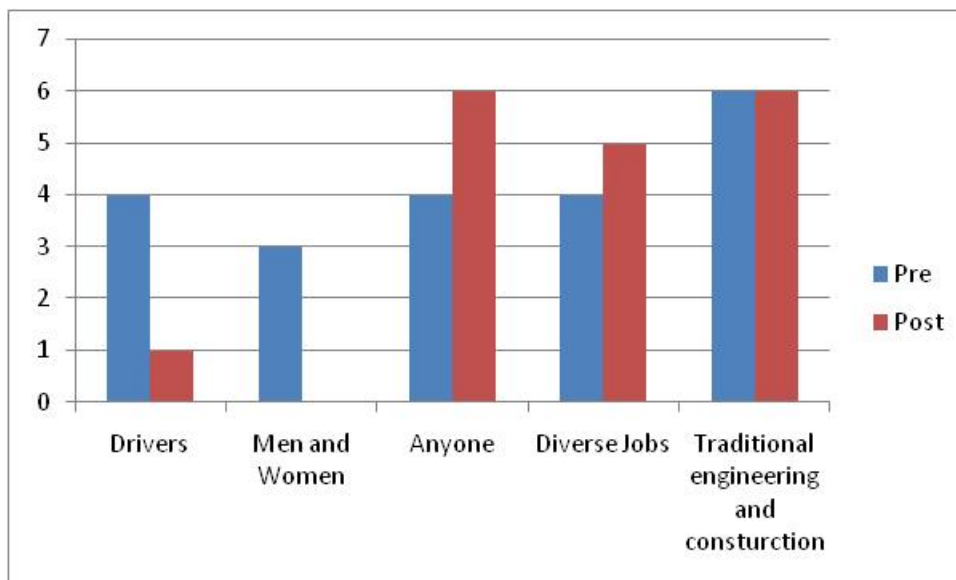
As show in figure 4 of the pre-survey responses to the third question “What are the potential solution to our transportation problems?” focused on alternatives to the single occupant vehicle (SOV), 3 focused on alternative fuel sources and 4 focused on how they personally accessed the

system. In the post-survey 7 responses focused on alternative fuels and 6 on alternatives to the SOV, 2 wrote about how they personally access the system and 1 on land use.



**FIGURE 4 What are the potential solutions to our transportation problems?**

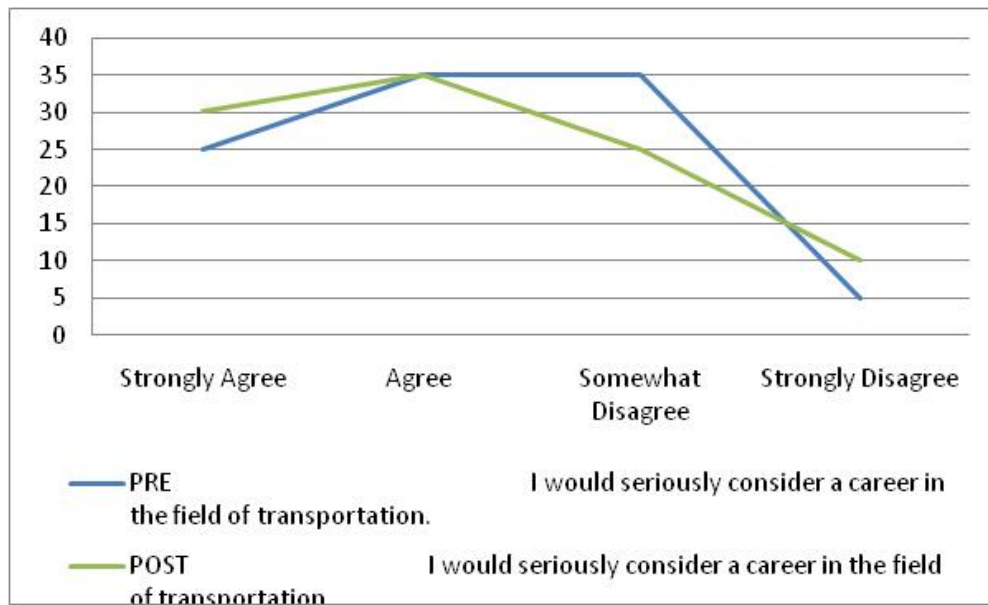
The answers to the final question asked in both the pre and post survey, “What type of people work in the transportation industry?” exposed a much broader view of transportation, as shown in figure 5. The pre-survey had 3 responses indicating that both men and women could work in transportation an indication of the cultural perspective some students brought to the program. As shown in figure 5 the post survey showed a shift from the view of transportation as people who drive vehicles to diverse job opportunities.



**FIGURE 5 What type of people work in the transportation industry?**

As shown in figure 6 there was a 5% increase in students responding that they either strongly agreed or agreed that they would seriously consider a career in the field of transportation from before the program started to the last week. Increasing awareness of career opportunities in transportation is a stated goal of the STI. Increasing awareness of career opportunities in general

is a goal of the Upward Bound program. These results shows that this component needs to be strengthened.



**FIGURE 6 Pre- and Post-survey of students attitudes about careers in the transportation field**

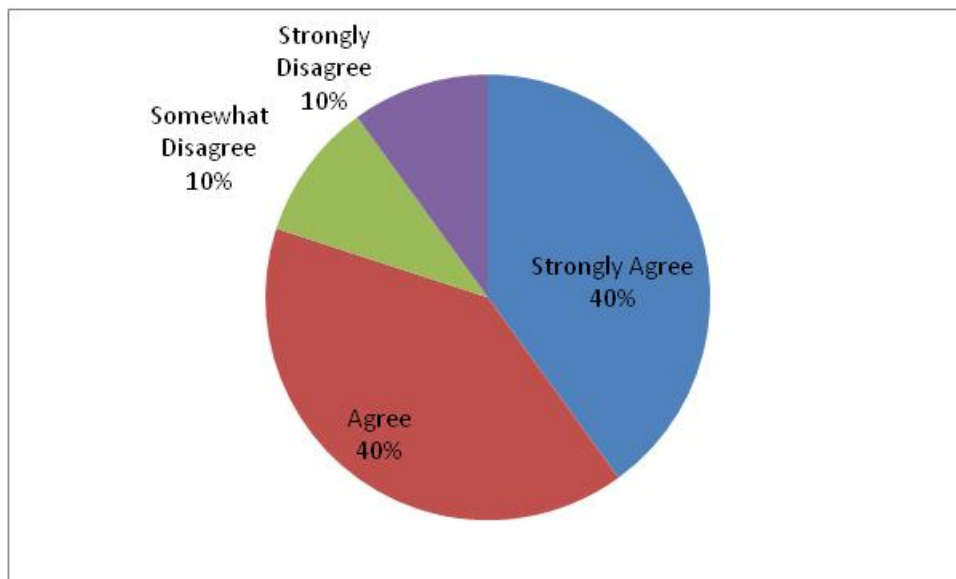
While students may not have flocked to the transportation industry as a career choice their writing indicates an increased awareness of the role of transportation.

“In upward bound i have learned how transportation is working in the united states.”

“...summer college have been given me education about transportations and environment, college experiences, and opportunities to see other career fields...The most useful thing I have learned so far in Upward Bound is learning about different career fields that I didn't know before or new to me because it helps me to explore other careers and also I don't know what I want to be in the future.”

“I learned a lot about different career fields and what you need to do to accomplish them. I also learned a lot about transportation. It kind of got me thinking about what I want to do in the future.”

A clear measure of the program’s value is whether students would recommend participation by their peers. On this measure, as shown in figure 7, 80% of students either agreed or strongly agreed that they would recommend the program to their friends and classmates.

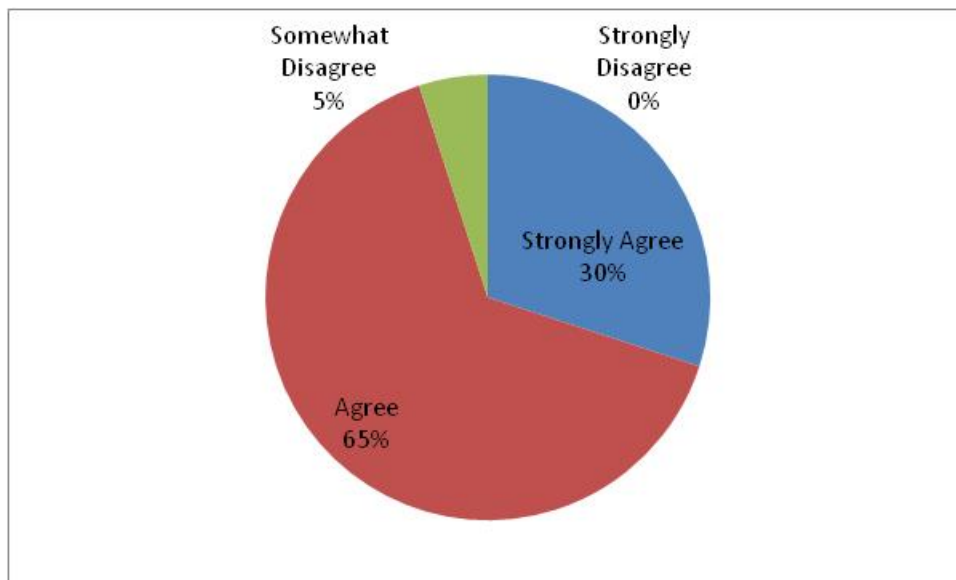


**FIGURE 7** Percent of students who would recommend the Summer College Institute to classmates and friends

Student wrote about the program adding a qualitative measure to the data.

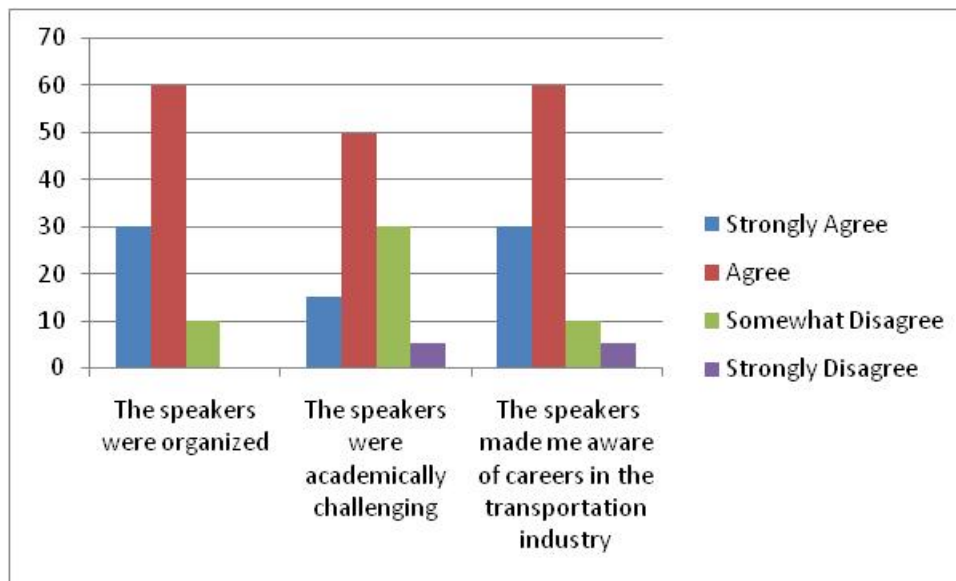
“I saw one of my friend over the weekend at home.  
 He asked me something about Upward bound program.  
 I told him that we are doing Summer College.  
 But he told me my other friends are all working and  
 I told him that coming to Summer College is very important too.  
 Because we are leaning how to be in College.”

Another measure of effectiveness is whether the students felt they gained practical experience through the program. As shown in figure 8, 95% of students either agreed or strongly agreed. This was the strongest area for this program.



**FIGURE 8** Percent of students who felt they gained practical experience from the program

The quality of the program is strongly influenced by the quality of the speakers. As shown in figure 9 below, 90% of students responded that speakers made them aware of careers in the transportation industry.



**FIGURE 9 Evaluation of Speakers**

Student evaluation also occurred in the classroom to measure comprehension through teacher assessments via tests, projects, and/or other written work. Math and ASL teachers provided grades at the end of the program.

## CONCLUSION

The perspective provided by a group of students where only 10% were native-born and white Americans was enriching and inspiring. Bringing together a non-traditional group of students to explore transportation enabled teacher and student alike to see transportation through new eyes. The students' views on transportation began with very personal perspectives and developed into a system perspective during their four week residency. The evaluations show a change in perspective and thinking about transportation from their personal experiences to a higher level awareness of a larger system with impacts beyond their immediate world. The post survey showed some thinking about land use, public health, the environment and financing of the system.

The on-line writing component enabled students to reflect daily on what they heard, saw and experienced. These writings also revealed the challenges of working with a large number of ESL students. The writing process enabled students to reflect on the experience and their "take away" from the speakers and field trips and provides a rich resource of materials to analyze.

The strong partnership with a US Department of Education funded program provides opportunity to leverage additional resources and to attract a diverse group of students Summer Transportation Institutes.



**FIGURE 10 UVM Summer Transportation Institute graduates, 2008**