

# 21st Century Transportation Workforce Summit

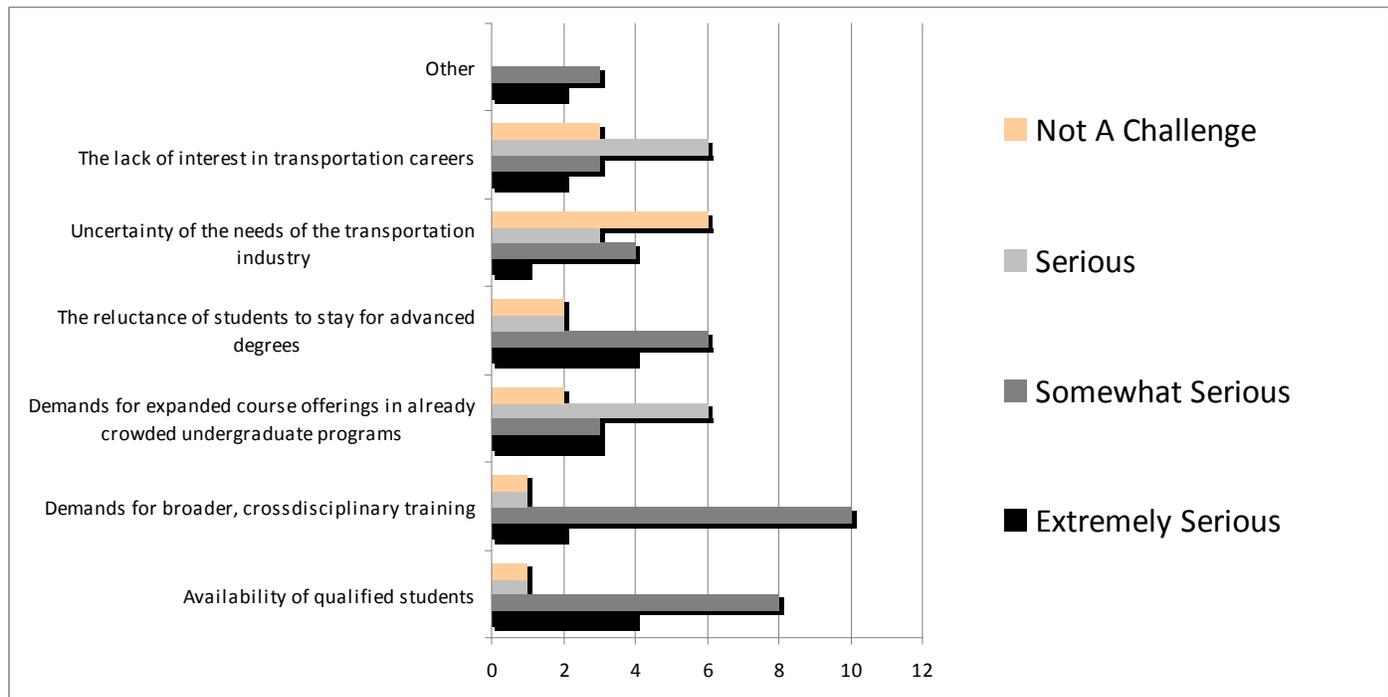
December 8-9, 2008 || Madison, Wisconsin



## Education Survey

The survey was sent to all UTCs and the major non-UTC institutions in the region. Fourteen responded.

1. What do you see as the challenges involved in preparing students for careers in the transportation industry?



2. If you selected "Other" in question 1 as anything but "Not A Challenge", please describe the challenge in detail.

- Students trained in engineering often have very little experience in thinking independently. They can do problem sets where the problem is defined for them but they don't do well at messy real world problems. Where part of their job is figuring out how to clarify the problem so they can do something with it. They also are not sufficiently trained in writing! Students trained in other disciplines often have too little math to do graduate work in TE easily.
- Post-911 Visa restrictions for international students, many of whom are extremely qualified.
- Many of the students entering from high school do not have a good foundation in math, science and communications skills.
- Salaries are depressed because of the strong influence of the public sector.
- Lack of understanding about what transportation is and how broad it is.

3. What changes have you made to your planning program to meet those challenges?

- Not enough! The joint TE-CRP program has been reasonably successful at improving the skill sets of each subgroup of students.
- Graduate Certificate in Transportation, Dual Degree between MS CE and M Urban and Regional Planning
- Established undergraduate enrollment controls re: demands for expanded course offerings in already crowded undergraduate programs.
- We are considering entrance exams to identify deficiencies and provide the student with a corrective action plan. We are also encouraging professors to raise the level of these skills in the classroom. We are also considering the addition of a class focused solely on engineering analysis techniques in the sophomore year.
- Attempted to make planning courses more quantitative and more computer intensive.
- We are trying to engage the faculty in a more forward look into the future. It is challenge to motivate faculty as many see "as is" situation as being fine. What is the problem?
- Interdisciplinary fellowships
- We have a new interdisciplinary program in bioregional and sustainable planning that includes an important transportation component.
- Addition of transportation planning course and expansion of another course. Active recruitment of students into Masters program. Currently revising curriculum to focus on planning and business applications.
- A broader overview of material to meet a wider array of student interest.
- More recruitment and financial aid
- Increased number of faculty, developing additional courses related to land use, transit, non-motorized transportation. Offered interdisciplinary graduate certificate program and interdisciplinary transportation student organization.

4. What changes have you made to your civil engineering program to meet those challenges?

- Graduate Certificate in Transportation, Dual Degree between MS CE and M Urban and Regional Planning
- Dual degree MS/MUP program with urban planning; deeper and more rigorous senior design capstone experience; raised freshmen admission standards; ABET "outcomes" have a broadening effect on all civil engineering programs.
- Offer top potential graduate students higher pay to entice them into our graduate program, use creative methods to get students Visas
- We have and are continuing to review every engineering course to ensure that prerequisite courses prepare students for the follow on courses.
- Have more courses taught by Civil Engineering rather than farm them out disciplines where they may learn the technique but not the application. We have also tried to make our classes more consistent with industry, for example, we switch to the CADD software more common used by road designers in our highway design class. We also plan more importance on business processes and economics.
- We are starting to integrate more industry-based adjuncts to help fill the gap in the university and practice.
- Not many.
- We are conducting several research projects to learn more about outcomes and understandings required for students. We are also co-hosting a national conference in 2009 on the introductory undergraduate transportation engineering course.
- Different courses, more breath and less depth in entry-level courses.

- Not aware of any.
- Offered continuing education courses for topics such as construction management that may not be covered in undergraduate. Offered interdisciplinary graduate certificate program. Offered weekend masters program in infrastructure systems for practitioners and interdisciplinary transportation student organization.

5. What are the enrollment trends for transportation students compared to ten years ago?



6. What do you see enrollment to be in the next five years?



7. Have you done any post-graduation surveys of your civil or planning students?



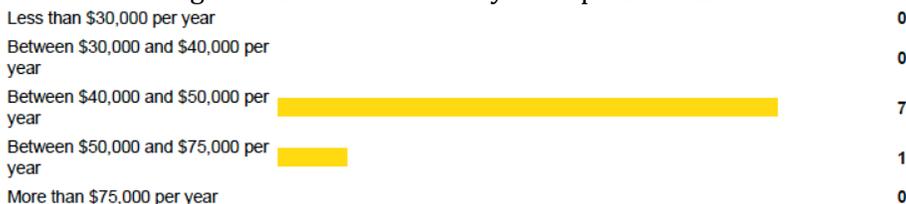
8. What proportion of your civil and planning graduates at the bachelors level are employed in the transportation industry?



9. What proportion of your civil and planning graduates at the bachelors level are employed in the transportation agencies?



10. What is the range of salaries for an entry-level professional with a bachelor's degree?



11. Are you a formal partner with the transportation industry - public agencies and private interests - in meeting the continuing educational needs of the transportation workforce?

Yes - Public agencies		2
Yes - Private activities		0
Yes - Both		9
No - Skip to question 13		3

12. What (if any) programs do you have in place to help meet those needs?

Interdisciplinary degree programs		1
Interdisciplinary certificate programs related to degree programs		3
Extended hour degree programs		2
Distance learning degree programs		2
Short courses tailored to transportation		1
Other, please specify <a href="#">view</a>		2

13. Has your institution established programs at the K-12 levels to encourage students to consider classes that will prepare them for careers in science and/or transportation?

- Not in any big way
- Yes, don't know details, check with CTS at U of Mn.
- No, but we are discussing such a program with the state DOT
- No.
- We have started a pilot program in a local high school to allow students to take an introduction to engineering.
- The college and the transportation center both run a high school career fair.
- Not anything formal.
- Yes Summer Transportation Institute
- In progress.
- No.
- Nothing formal; participate in Project Lead the Way and other student activities.
- Yes, participate in FHWA's NSTI program. Assisting Garrett A. Morgan grant recipient with Baltimore City Schools.
- We have developed course material and web tools for high school teachers to use in teaching about transportation

14. What other insights would you offer on the subject of preparing students for careers in transportation?

- The idea that civil engineering is a prerequisite for a career in transportation needs to be reconsidered. Increasingly the skills needed are planning, oral and written presentation, public outreach, management, economics and finance AS WELL AS engineering. Within engineering, computer sciences, electrical and mechanical engineering, operations research, and broader systems engineering are all relevant. Not everyone needs to do everything, but students need a broader education than most CE programs are providing. The CE curriculum is too chocked full of CE skills courses to give our students the broader education they need and deserve.
- The industry needs to pay more if it wants more and better students. The industry should reward graduate degrees more or it will not get skilled workers. The Midwest is especially cheap compared to salaries on the East and West Coast.

- Salaries need to be higher, especially at the state DOT, to compete with other areas of engineering. High school preparation is math is well below adequate for many students.
- Transportation is not a "sexy" career path for high schoolers. In fact, most don't even have a clue what transportation professionals do. Exposing high schoolers to the basic tasks of a career in transportation is necessary to boost our enrollment.
- Don't just concentrate on college and university ed; consider post secondary tech training too
- First we need to recognize that transportation needs include a wide variety of disciplines including engineering, geology, biological sciences, social science, business, etc. Unfortunately, we never teach students to work with other disciplines. They get their first taste when they enter the work force. Discussion with industry reveals that students are accelerated into leadership positions far faster than the past. Consequently they are asking for students be provided leadership training in the undergraduate program. This does not necessarily require additional courses, but perhaps requiring leadership in the classroom.
- We have far too many transportation graduate programs competing for a smaller number of students. We need fewer transportation graduate transportation opportunities. Four (or more) in Wisconsin and three in Iowa is nuts.
- We need a better marketing message to connect with young people. We have to get off the engineering data case for the need and more beyond this.
- Understanding it is more than highways and building.
- Link study of transportation to issues of economic development, energy, and environment, as well as to computer science and other technologies, areas in which students may already have more of an intrinsic interest. Encourage development of skills in a variety of areas.
- Need to reconsider the traditional undergraduate curriculum for transportation students.
- Partner with transportation agencies to offer paid internships
- Students are influenced by job demand. Low salaries by public agencies hinder the recruitment of students to the field of transportation.

15. How can we improve the workshop?

- Not sure. I am sure you will do a great job.
- Recognize the obvious.
- Don't know what you intend. Obviously, you should not ignore the role of secondary education as a critical link in the chain.
- Invite CEO's who use transportation students to discuss their needs both in numbers and skill sets.
- Allowing more schools to specialize rather than each state university having to do every thing for that state.
- Have a blend of leaders from K-12, university, and practice side. These are three different cultures.
- Discuss ways to establish stronger links between educational institutions and public agencies/private firms involved in transportation.
- Consider educational and career paths of those considering, entering, or already in transportation professions.
- Identify specific discussion topics and kept it focused.
- Not familiar with your workshop, but put emphasis on internship opportunities
- Disseminate results widely

16. What advice would you provide a student to prepare them for the career path?

- Take a broader set of courses than you are required to take. Make sure you have economics, statistics, history, maybe some political science or sociology as well as engineering courses. Learn to write. Do an internship or several with public and private agencies.
- Transportation is a mature sector that will give you a nice stable upper middle class income. The industry is so slow and static do not expect major changes on the infrastructure side compared to other engineering disciplines.
- Basics: writing and math.
- Focus on getting a well-rounded transportation education with some amount of co-op/internship experience mixed-in. The job market for transportation professionals is slow right now and may continue to be as gas tax revenues decline. Therefore, competition for entry level jobs will likely increase. Thus, it is important to be known and visible with your professors who often are asked by employers for potential candidates for jobs and for reference calls.
- Which specific career path?
- Develop not only the technical skills but also the people skills including communication and leadership skills.
- Go into a field of engineering other than Civil if you want a good chance at a good salary and respect in your job.
- Teach them what it means to be a professional. Expose them to enrichment experiences as part of undergraduate education...travel abroad, research, student organization and leadership, and practical experience via internships.
- Read policy documents - interdisciplinary advisory committees
- Develop knowledge in a variety of areas related to transportation in order to be conversant in policy, planning, economics, engineering, finance, analytical methods, etc., and also develop expertise in at least two specific areas.
- Develop core skills -- quantitative, technological, and written and oral communication.
- Be broad and capture several interests.
- Find out about all of the aid and internship opportunities to support your education
- Pursue an internship or summer job in transportation to test interests--they are available.