

# **Institute of Transportation Engineers**

Knowledge Based Decision Making

A White Paper for the Mega Issue Discussion at the April 30 to May 1, 2004 Meeting in Annapolis, MD

## **THE PROFESSIONAL TRANSPORTATION WORKFORCE: CAUGHT IN “A PERFECT STORM”**

The Institute of Transportation Engineers (ITE) has recognized that a “perfect storm” is brewing within the transportation community. The unmet needs of the profession, academia and system users are converging. Successfully implementing our strategic objective, “assuring a competent future transportation professional workforce,” will enable the profession to survive this storm and be better prepared to meet society’s demand for a safe transportation system that helps to fulfill a plethora of societal objectives. For the Institute to be positively positioned, we must assess the evolving dynamics of the profession, our members’ needs, our capacity and strategic position to pursue our objective, and the ethical implications of our choices.

Participation in the affairs of a professional society, like ITE, on the local and national level has been deemed indispensable to earning credibility within an industry. Accordingly, our efforts will safeguard ITE as the vessel that will not only survive this storm, but will carry the longer-term relevancy of the Institute, its members and the profession.

### **CURRENT REALITIES AND EVOLVING DYNAMICS**

Transportation professionals, educational institutions, faculty and students are facing unmet needs. These challenges create a void in the ability of the profession to ensure the longer term management of the system; to address emerging trends in the industry; and to address the evolving needs of system users—resulting in the “perfect storm”. There are two key unmet needs: 1) filling the pipeline with well-prepared transportation professionals; and 2) maintaining the professional competency of transportation professionals. ITE’s role in attracting, training and retaining a diverse and competent professional transportation workforce will serve to get the pipeline flowing and to navigate our profession to safer shores.

### **PROFESSION**

The Federal Highway Administration has estimated that nearly 40 percent of the state and local transportation workforce is between the ages of 45 and 64. In the next decade, nearly 50 percent of all transportation workers will begin to retire, largely from middle and upper management positions.

Here are the realities:

- o The fastest growing sectors of the workforce are in areas requiring the highest skill levels.
- o Employers indicate that entry-level engineers not only lack significant exposure to transportation engineering methodologies, they also lack communication, negotiation and management skills.

- o The focus on safety in TEA-21 reauthorization will require professionals with more knowledge of the impact of roadway design and operations (signal timing, accessibility) on safety.
- o There is a disconnect between the needs expressed by employers for training in non-technical areas and their economic willingness to mitigate that need. (Historically, ITE's programs focusing on non-technical professional development are sparsely attended.)
- o Today's workforce is significantly more challenged than its predecessors in balancing routine daily work tasks with personal/family life commitments and has limited desired and ability to actively participate in professional organizations.
- o There is a constrained amount of time and money available for professional development and limited course offerings that are time and cost effective.
- o The salaries for graduates with B. S. and M. S. degrees are not significantly different.

### **CERTIFICATION AND CONTINUED ACCREDITATION**

The industry is moving toward more stringent requirements for the certification of transportation professionals. The Institute has supported the formation of the Transportation Professional Certification Board, Inc. which has an ongoing Professional Traffic Operations Engineer certification program and has under consideration a number of other certification programs. The American Society of Civil Engineers (ASCE) has initiated an effort to raise the qualifications for civil engineers to account for some of the skills that are lacking. Their proposal has been met with great concern and debate. The Education Council is developing an article on the issue for submission in the *ITE Journal*.

In addition, nearly 50 percent of states have moved to require accredited PDHs/CEUs for P.E. recertification. ITE is submitting an application to the International Association for Continuing Education and Training (IACET) to become a recognized provider of education and training programs to fulfill the renewal requirements for New York State P. E. license renewal. The Institute is already a recognized provider in the State of Florida.

- ▶ Should ITE also be advocating for higher qualification in the transportation workforce?
- ▶ Should ITE also be advocating for uniformity of requirement to be a recognized provider of professional development?

### **ACADEMIA**

A number of universities in the United States and Canada have dropped transportation graduate degree programs and/or undergraduate transportation courses. At other universities vacant positions are slow to be filled or are allocated to other engineering disciplines. As such, there is more reliance on garnering transportation related course work and fundamentals in the workplace and through the remaining graduate degree programs. The Accreditation Board of Engineering and Technology has compounded this problem by no longer requiring transportation courses for the accreditation of undergraduate Civil Engineering degree programs. Unfortunately, undergraduate civil engineering degrees often take up to five years to complete. The time spent meeting these requirements includes limited, if any, training in transportation and the non-technical areas identified by employers.

- ▶ Should ITE be an advocate for the reinstatement of the transportation course requirement?

- ▶ Should ITE be an advocate for the reinstatement of the transportation graduate programs?
- ▶ What services should ITE be implementing to serve the transportation faculty?

## **STUDENTS**

Civil engineering and transportation engineering programs suffer from an image problem, due to lack of exposure to career information and opportunities. Undergraduate civil engineering programs may provide a “Transportation 101” course, which only provides superficial coverage of several topics rather than addressing “real world challenges” that would lead to an interest in the discipline. As such, there is a declining pool of talented transportation engineers emerging from colleges and a small pool of civil engineering graduates actually interested in transportation.

Several ITE Districts and Sections have reduced their emphasis on scholarship programs and have focused on providing travel assistance for students to attend ITE meetings. The assistance provides exposure to the transportation discipline, networking opportunities and other avenues to explore specialized topics.

- ▶ What are the activities/programs ITE can implement to increase awareness of opportunities in transportation careers prior to undergraduate matriculation?
- What activities/programs can ITE implement to support students?

## **EMERGING ISSUES AND INDUSTRY TRENDS**

System users have growing expectations for transportation system decisions and investments that contribute toward successful communities. As societal emphasis on personal mobility continues to both steadily and rapidly increase, the role of the traffic/transportation engineer in facilitating overall quality of life has become evident. Consequently transportation professionals are placed in the center of controversy between communities and developers in balancing the demand for increased transportation access and capacity, while preserving community integrity, assuring pedestrian safety and enhancing overall livability.

Further, funding limitations and the continued deterioration of our system have led to a growing gap between needs and resources. Transportation professionals need to be more creative in approaching funding opportunities (public/private partnerships) and will need additional knowledge in business principles.

- ▶ Should ITE be offering programs in this area?

## ***Management and Operations (M&O)***

While ITE has been at the cutting edge in bringing M&O issues to the fore, a paradigm shift is still required to get the industry on board. If we are successful, that increased recognition would require professionals with broader skill sets—software engineering, system engineering and telecommunications expertise. M&O also requires the ability to work across jurisdictional and modal boundaries. These kinds of partnering skills are not in the current transportation professional skill set.

► Should ITE broaden its membership base to attract such individuals or offer programs/seminars to our existing members, which would increase familiarity with these skills?

### ***Accessible Transportation Facilities***

Acknowledgement of the varied needs of transportation system users has been slow and even non-existent within the profession. The profession is under increasing pressure to adapt to the needs of older drivers, pedestrians, and the mobility, sight and hearing impaired. Designing for accessibility requires a change in the paradigm of who the profession is serving. The following issues are at the forefront of what is facing the community.

- o Transportation professionals must have knowledge of changing ADAAG requirements and other information that provides awareness of the requirements of planning, designing and operating transportation facilities for all users.
- o There is a need to increase the knowledge of pedestrian human factors. There is very limited training at the federal level, limited staffing at the federal level and limited professional expertise in the transportation community.
- o Pedestrian accessibility lawsuits are on the rise and are overwhelmingly won by plaintiffs.
- o The emphasis within communities on context sensitive design/solution requires abilities to work with a wide variety of people, who are not technically inclined.

► Which of the above, if not all, should ITE be addressing?

### **WHAT ARE THE NEEDS AND WANTS OF OUR MEMBERS?**

The changing needs of the profession, the academy and transportation users is what has created this perfect storm and requires immediate proactive leadership by ITE. However, if we are to successfully navigate these waters to accomplish our objective, we need to identify whom we are taking on this journey and what they want and need. Likely targets include:

- o General transportation professionals (varying degrees of expertise)
- o ITE members
- o University Deans and Department Heads
- o Faculty
- o Students
- o Public Sector
- o Private Sector
- o General Public

► Should all of the above or the specific categories be included in our action plan for success?

The following skill-sets have been recognized as areas that are lacking in the profession yet are desperately needed to meet the challenges of our changing industry.

- o Communications skills (Writing, Speaking, Social)
- o Emerging technologies and other issue areas (ITS, M&O, safety, human factors,)
- o Software engineering/system engineering
- o Public relations (general public, decision makers, elected officials)
- o “Training the trainer”—techniques for meeting needs of the adult learner
- o The Code of Ethics

- o Business methodologies for dealing with public-private partnerships
- ▶ Do we have enough information about our target customers and the desired knowledge base?
- ▶ How can ITE assist our members in becoming more proficient in these areas mentioned above?
- ▶ What other associations or organizations are working in these areas?
- ▶ Are there specific areas where we are best suited to lead?
- ▶ Do we know the best avenues (see below) through which ITE can have the most impact on meeting the preferred needs of our membership and the industry?
  - o Professional Development CDs
  - o Online Learning
  - o Publications
  - o Webinars
  - o Social Engineering/Public Relations
  - o University core curricula
  - o University staffing
  - o Local ITE initiatives/programs
  - o International ITE Technical Conference and Annual Meeting
  - o Seminars
  - o In-house Employer Training
- ▶ Are there other avenues we have yet to explore?

## **ASSESSING OUR STRATEGIC POSITION AND CAPACITY**

### **ITE IS STRATEGICALLY POSITIONED TO MEET THE CHALLENGE**

ITE is an organization of transportation professionals inclusive of the depth and breadth of the industry. We have a solid reputation within both the public and private sectors for developing products and programs that meet the needs of our membership and the industry. ITE has been on the cutting-edge of educating the membership on emerging issues—ITS, management and operations (M&O), workforce development and designing for all users.

- ▶ Do we know if employers are looking to ITE for technical training and to other organizations to meet their other non-technical professional training needs?
- ▶ Do we have knowledge as to what the training needs are, what other related organizations are providing and what the gaps are?
- ▶ Do we have enough information about our target customers and the desired knowledge base?
- ▶ Do we have enough information about the challenges and issues facing engineering colleges and universities?
- ▶ Is additional information needed to assess the issues and their magnitude in order to choose a wise course of action?

### **CAPACITY ASSESSMENT**

ITE's current activities in the areas of professional development, education and career awareness include:

- o ITE Student Chapters (126)

- o Student Paper/Student Chapter Awards
- o Fellowship Programs
- o Career Video/Brochure/Poster
- o National Transportation Week Poster Contest
- o Technical Conference and Annual Meeting Technical Program
- o Collaborative Work with Robert Wood Johnson, Easter Seals, AAA Foundations
- o ITE Education Foundation (Professional Development Program)
- o Online Training
- o ITE Website-Toolboxes
- o Publications-Informational Reports, Recommended Practices
- o Education Council
- o ITS Standards Outreach Education & Training program
- o Eno Foundation-Board of Regents
- o PTOE
- o Seminars

- ▶ How do we characterize these efforts?
- ▶ Where have we had our greatest successes and failures?

If we are going to “step up” our efforts to achieve our strategic objective, additional information is required to determine our future capacity, specifically:

- o Skills needed vs. skills available
- o Staffing (current and future)
- o Content of current vs. needed programs
- o Funding (existing budget, public or private dollars)
- o Partnerships (sister organizations, various modes, consulting/industry)
- o Education Council relevancy

## **WHAT ARE THE ETHICAL IMPLICATIONS OF OUR CHOICES?**

What is ITE’s responsibility to the membership, the profession, and the public to assure that there be a competent workforce in the future?

More than a decade ago, an ITE committee focused on ethics wrote, “Engineers must display a level of competence based on training and experience equal to their responsibilities.” As this document has demonstrated, today the responsibilities of the transportation professional have taken on greater depth, breadth and influence. However, the training has not equaled those responsibilities.

- ▶ If ITE does not address the evolving challenges of our profession as described throughout this document, are we abdicating our responsibility to our members and/or profession?
- ▶ Will our choices put the credibility of ITE, its members and ultimately the profession at stake?
- ▶ What are the safety and quality of life impacts if transportation engineers lack the tools and expertise to design, operate and manage transportation facilities for all users?

## **CONCLUSION**

What is ITE's role in assuring a competent future transportation professional workforce?