ITS Community College Partners Workshop

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U.S. Department of Transportation, ITS Joint Program Office (ITS JPO)
ITS Professional Capacity Building Program (ITS PCB)

Workshop Executive Summary

Background

As Intelligent Transportation Systems (ITS) become more prevalent along the country's transportation network, it is increasingly important that higher education institutions produce technicians, engineers and planners with the knowledge to competently perform tasks in the ITS workforce. In September, the USDOT's Intelligent Transportation Systems Professional Capacity Building (ITS PCB) Program convened ITS educators from community colleges, technical, and trade schools around the country, along with practicing professionals, to strategize on how to improve ITS education to better suit the needs of ITS employers. The ITS professional community sees value to the ITS workforce by institutions offering two-year associates degree, certificate, continuing education, and transfer degree programs that teach targeted skills required for specialized ITS jobs. Looking at both entry-level and continuing education training, this inaugural ITS Community College Workshop drew from the success of the USDOT's ITS University Workshops held in the past.

The goal of the ITS PCB Community College Workshop was to incorporate ITS education into community college curriculum and learning programs. It is part of the ITS Joint Program Office (JPO) academic workshop series that has taken place over the last several years. This was the first community college workshop in the series. During these workshops, the JPO shares information about ITS PCB university and community college resources and collects feedback to develop new tools to advance ITS education. The workshop also provides opportunities to build cooperative partnerships within and outside of the ITS PCB effort.

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Goals and Desired Outcomes

Workshop Goals:

- Define and understand the current/future education needs for ITS technical position in the workforce.
- Identify and discuss existing tools from the ITS PCB Program and partners that colleges can use to help build the necessary ITS capacity in students.
- Openly discuss and document additional best practices in ITS education, as identified by educators.
- Define the unmet educational needs.
- Brainstorm potential solutions from the ITS PCB Program and partners to fill the unmet needs.

Desired Outcome:

- An updated definition for the knowledge and skills that an ITS technical professional should have.
- A formal gap analysis, comparing the ITS educational tools available to the ITS educational need.
- Potential solutions for bridging the ITS educational gap; and action items for the ITS JPO and partners.
- Continued dialogue among participants with regards to tools, resources, and best practices.

Workshop Summary

The workshop was held over one and a half days during which educators and practitioners learned what ITS training products are currently available, worked together to identify the ITS educational needs of their students, and developed strategies to meet those needs. Workshop attendees also participated in presentations, break-out sessions, and interactive exercises designed to foster the exchange of information, ideas, and best practices in community college-level ITS education and preparation of students for today's workforce needs.

Ms. Michelle Noch, Program Manager for Knowledge and Technology Transfer at ITS JPO, began the workshop by welcoming everyone, introducing the ITS JPO staff, and providing a brief overview of the ITS PCB Program. Welcoming remarks were also given by Egan Smith of the USDOT's Intelligent Transportation Systems Joint Program Office, David St. Amant of ITS America, and Valerie Lefler of Transportation Tech. Workshop participants then introduced themselves, shared their involvement with ITS, and how they introduce their students to ITS.

Following the introductions, Andy Berthaume of the ITS PCB Program facilitated an icebreaker exercise in which all participants answered questions about ITS need and status in the curriculum, and their hoped for outcomes of the workshop. Presentations were delivered about existing and emerging products and services from the National Operations Center for Excellence (NOCoE) and Transportation Workforce Centers (TWCs). Kara Chisholm of the ITS PCB Program presented on current job posting. A panel discussion followed on current needs. In the afternoon, participants heard perspectives from public agencies (transit, state, and federal), then private industry, and a panel thus composed on emerging needs. With breakout groups, the participants defined ITS educational needs and presented their findings in a full group discussion.

The second day began with a recap of the first and then delved into the array of ITS PCB Academic resources, other ITS PCB resources, ITE-related activities, and workforce tools such as CV training materials and ITSA State Chapter Workshop Training. Participants shared the approaches, methods, tools, and collaborations they've employed to address the educational needs identified in Day 1. After the open discussion and a break, Steve Johnson of HNTB presented on workforce needs in the private sector through the example of the THEA CV Pilot and the role of the Hillsboro Community College partnership. Breakout groups then identified the gaps between current educational capabilities and the workforce need. A brainstorming session served to propose solutions. Each group developed action items as they applied to the ITS Academic/ITS PCB Program, Academia, Professional Associations, and Other Federal Programs. Upon reconvening, action items were discussed by the group and synthesized. Next steps were briefly discussed before Day 2 adjourned. In the afternoon, some of the workshop participants went on a tour of the Virginia DOT Public Safety & Transportation Operations Center (PSTOC).

The ITS Educational Need

Participants defined the current and future ITS educational need. It was agreed that technical ITS professionals need the following abilities and knowledge when entering the field:

Knowledge, Skills, & Abilities:

- Wireless signal location, coordination, frequency
- Network mapping & management, network management software (Cisco, etc.)
- Network hardening, incident reporting, crisis management
- Communication—written and verbal
- Social skills & public relations
- Critical thinking
- "Outside the box" thinking
- Teamwork/interdisciplinary communication/multijurisdictional operation management
- Stress management
- Environmental management & rodent control
- Troubleshooting
- Systems engineering basics/systemic thinking
- Mechanical abilities
- Emerging technologies
- Transportation lingo/industry vocabulary

- Computer and software literacy
- Electronics/electrical skills
- Math and statistics
- Data analytics & big data utilization
- Wiring, splicing, soldering
- Data security, cybersecurity, privacy
- End user perspectives/scenarios
- Automotive tech (CV, V2V, V2I, V2X)
- Traffic operations
- Traffic zone management
- Traffic signal timing & programming
- Certifications
- Bucket truck operations & CDL (Class B)
- Tower climbing
- Heavy equipment & power tool usage
- Weatherproofing
- Basic safety awareness (PPE & OSHA)
- GIS/GPS
- Legal regulations & policy
- Technical regulations & best practices
- Practical experience/hands-on skills
- Awareness & exposure to opportunities
- Passion & interest

Next Steps

ITS PCB Program

- **Summarize the results** of the polls and the discussions from the workshop and send them out to the group along with a summary.
- **Compile a list of resources available.**
- **Share all the presentations** (confirming acceptability with presenters).
- **Leverage existing communication methods** to advertise a new training, educational resource, etc.
- **Compile a list of all attendees** of this workshop and share with the group
- **Create ITS job descriptions and "common language."** Describe the knowledge, skills, competencies, proficiency level, and certifications required for each "level" of that job.
  Define each "career pathway." Show a career path for each ITS Job, describing capabilities and requirements at each level. ITS PCB Team to work closely with the workforce centers, NOCoE, ITS America, and ITE to develop this. Some workforce centers have done work defining what these skills are (see Peggy's presentation from Day 1)
- **Schedule a follow-up meeting/webinar with this group**. To assist all parties in following through on action items, and to ensure our efforts produce products that address the need in a useful and usable way, USDOT will schedule follow-up meetings with this group. Valerie Lefler suggested holding a conference in 30 days that we can invite the local ITS technicians to.
- **Nationally, do a follow-up** to this workshop one year later to assess progress.
- **Have an ongoing forum** with this group and others who could contribute to the conversation.
- **Align learning materials with ITS competencies**. If learning materials were developed for specific competencies, they could be integrated into a variety of existing courses or programs.
- **Create small "buckets" of slides (3-4 slides) on topics that can be incorporated into existing courses and presentations,** "Tech Brief" or "ITS Vignettes."
- **Create ITS Job Descriptions.** Describe the skills, competency/proficiency level, and certifications required for each "level" of that job. Not all ITS jobs require the same skillset. To help educators teach to what students need.
- **Work closely with the workforce centers, NOCoE, ITS America, and ITE to develop this.** Some workforce centers – such as Peggy – have done work defining what these skills are.
- **Schedule follow-up meeting/webinar with this group.** To assist all parties in following through on action items, and to ensure our efforts produce products that address the need in a useful and usable way, USDOT will schedule follow-up meetings with this group.
- **Introduce ITSA to colleges.** Send an email to the colleges attending this workshop and state/local ITS chapter president to introduce the ITS development program for colleges. Describe sample job postings for the profession which involve positions not requiring a Bachelors or Masters.
- Colleges involved in this effort would then be encouraged to reach out to state DOT's, localities and firms to assess potential interest, demand and needs
- **Invite college representatives and students to ITS state chapter meetings.**
- **Develop state or local level workshops** to address potential opportunities for development of CC ITS programs and follow up with development activities.

Transportation Workforce Centers

- **Regional Transportation Workforce Centers** to update and maintain job descriptions for each region and adjust for regional requirements.

Educators

- **Work with local companies, DOTS, and workforce centers to align curricula** with needs, certifications, etc. required for local jobs. Especially for companies with proprietary standards and certifications, such as CISCO, universal job descriptions may not fit here – and more specialized descriptions and curricula are required (program development through P3s). Create "regional" curricula needs.
- **Hold a peer exchange** or local forum between colleges and employers.
- **Look into integrating existing resources into curricula.** ITS PCB Standards training modules teach core concepts such as SE. ITS PCB Case Studies give students an opportunity to practice communication and practically apply concepts. IMSA materials help prepare students for certifications. These tools may be useful in supplementing curricula and addressing the existing need.
- **Incorporate Case Studies.** Problem-based learning helps address critical thinking, trouble-shooting, and promotes teamwork.
- **Identify best programs to integrate ITS.** Should ITS be integrated into engineering? IT? Should an ITS degree program be created?
- **Sign up for T3 (and T3e) webinar series.**
- **Submit materials for the ITS Curriculum Website.** There are networking opportunities, and opportunities to highlight/feature programs here.
- **Look into ITS PCB Standards Modules and Case Studies, and integrate them (as needed) into curricula.** Standards training modules can help students understand core concepts such as SE. Case Studies give students an opportunity to practice communication and practically apply.
- **Perform a job and task analyses when new curricula are developed** to identify specific competencies. [This is especially helpful when dealing with jobs that involve interdisciplinary learning]. Aligning ITS materials with competencies could help streamline the process of finding helpful existing material.

Professional Societies

- **Raise awareness** of trainings, forums, certificates, job awareness, etc**.**
- **Coordinate** with ITS PCB, NOCoE, ITS America, etc. to leverage outreach (via newsletter and other) resources.

State DOTs and Employers

- **Peer exchange or local forum between** colleges and employers.
- **Work with community colleges** to ensure curriculum is teaching to the needs required for local jobs.

All Workshop Participants

- **Road Map and Flow Chart to identify next steps.**
- **Create a process for updating curricula that also meets accreditation and other requirements. This could include industry** certification requirements, state requirements, etc.
- **Consider Department of Labor (DOL) competency levels.** Use DOL template to create ITS competency levels.
- **Figure out what the categories are, then compile a list of vendors**
- **Hold official DACUM exercise.**
- **Peer exchange or local forum between** colleges and employers.

Participants

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