UNITED STATES
DEPARTMENT OF TRANSPORTATION

Intelligent Transportation System (ITS) Joint Program Office

T3 Webinar

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Educating Students for ITS Careers: Are Universities Meeting the Challenge?

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ITS Joint Program Office

U.S. Department of Transportation

UNITED STATES
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Educating Students for ITS Careers: Are Universities Meeting the Challenge?

- Host – **Mac Lister**, FHWA, ITS PCB Program Manager
  - Overview of the ITS PCB Program

- Presenters - **Nicolaas Swart**, P.E., Division Manager for Traffic Management, Maricopa County Department of Transportation and **Reza Karimvand**, P.E., Assistant State Engineer, Arizona Department of Transportation
  - Regional and State transportation agency perspective on educational background and needs for ITS Engineers

- Presenters - **Peter Martin**, P.E., PhD, Civil Engineering Department Head, New Mexico State University and **Mohammed Hadi**, P.E., PhD, Associate Professor, Florida International University
  - University ITS Education Programs and Education Need for the Delivery of ITS Learning

- Questions and Answers

Overview of the ITS PCB Program

- Challenges
- Role of the ITS PCB Program
- University Partners Workshops
  - State of University ITS Education
  - Model ITS Education Programs
  - Positive Outlook for ITS Job Market
- What is the ITS JPO Doing to Help?
  - Developing New Learning Resources
  - ITS PCB Future Plans
  - Research Needs

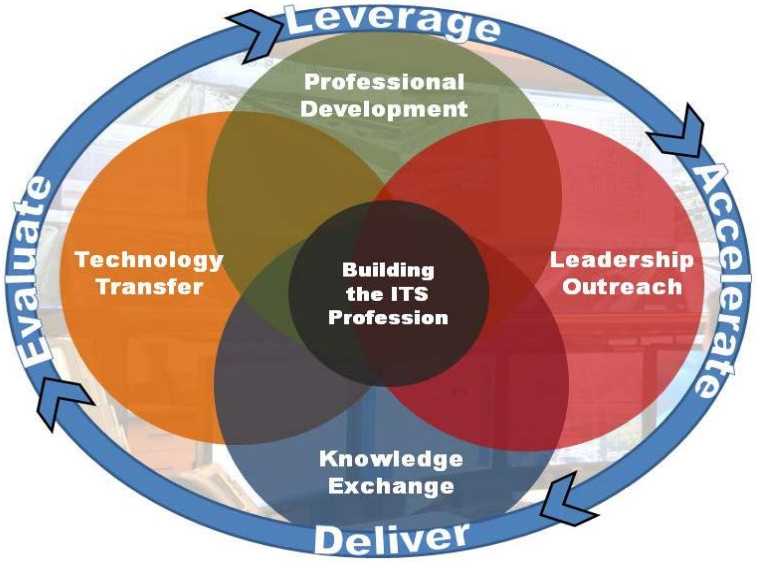
Challenges

- Fifty percent of the current workforce is or will become eligible for retirement over the next 10 years.
- Increased competition from other fields for a smaller pool of skilled workers.
- Need for substantially different skill sets and abilities to respond to rapidly changing demands and a transforming industry.
- Responding to different learning styles of younger workers.

Image Source: Angela Maiers, “STEM in Words: Let's Make What We Say Count”

Role of the ITS PCB Program

- Part of U.S. DOT ITS Joint Program Office (ITS JPO)
- Authorized by Congress in 1996 to develop the workforce competencies to transform the transportation infrastructure through ITS
- Reauthorized by Moving Ahead for Progress in the 21st Century (MAP-21)
- In 2010 embarked on new strategic direction:
  - Develop new ITS content and fill gaps in existing content.
  - Build partnerships to direct learning to the right audiences.
  - Move to cost-effective, engaging delivery methods.



University Partners Workshops

- JPO hosted two university workshops (January 11, 2012 and September 26-27, 2013)
- Brought university professors together with the JPO to discuss:
  - Model university ITS educational programs;
  - Education needs for the delivery of ITS learning; and
  - Ideas to move ITS university learning forward.

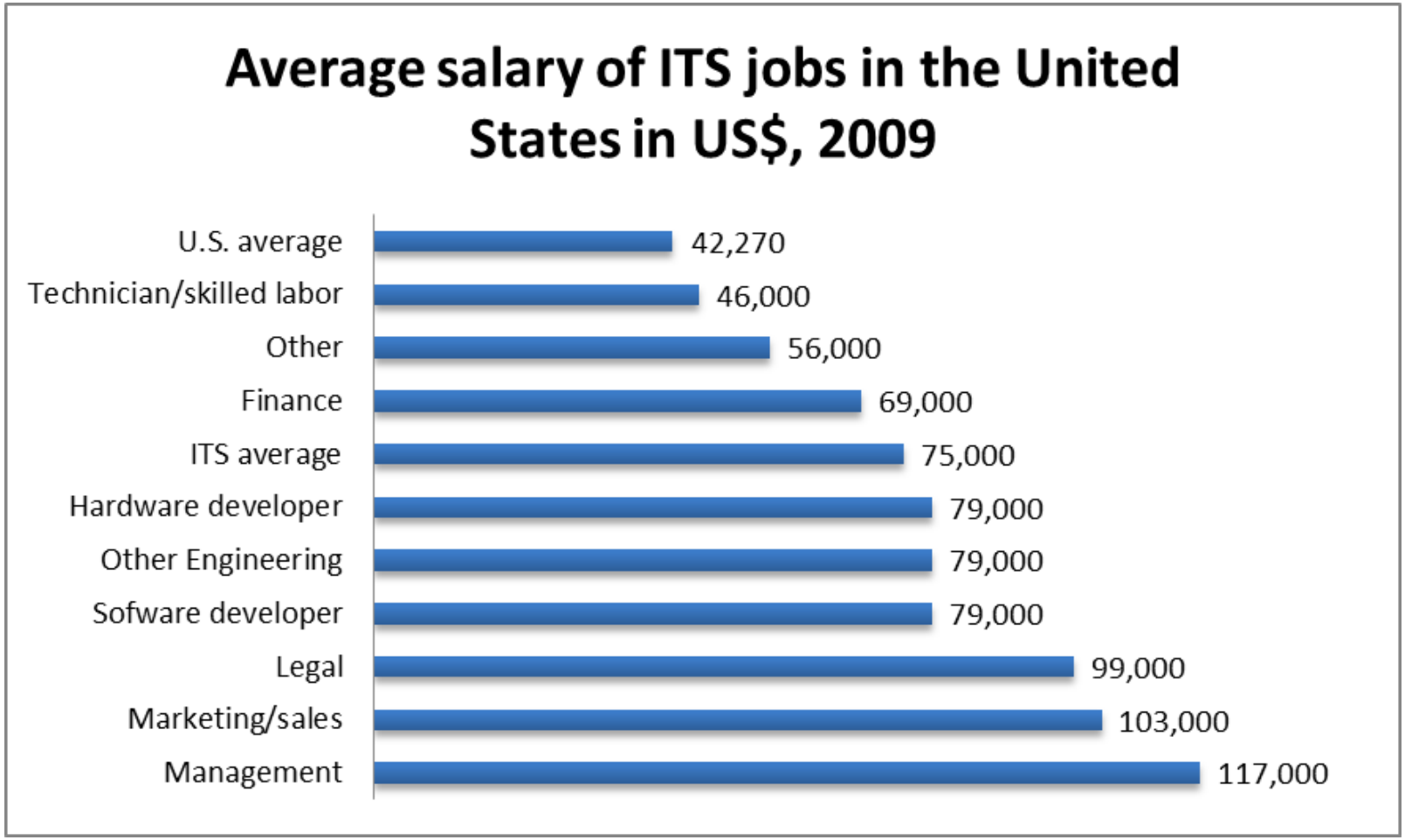
Participants in ITS PCB University Workshop, September 27, 2013, Source: U.S. DOT

University Partners Workshops

- **University ITS Education**
  - Current ITS presentations and materials tend to be theory based.
  - Significant challenges exist in attracting and exposing students to ITS early in their academic careers.
  - Good technical classroom material is needed to excite students about ITS and draw them into the field.
  - The development of Certificate Programs versus a degreed ITS Programs within a university is another decision that warrants a review at the institutional level.
- **Defining a Model ITS Education Program**
  - Develop a certificate program.
  - Define the industry needs for the delivery of ITS learning.
  - How to attract students to the ITS field?

- **ITS Engineers in the Workforce**
  - Transportation industry is focused on maintaining, operating, and managing the system more efficiently and effectively.
  - Research shows a growing ITS market and future ITS related jobs.
  - Supports training and education programs for the ITS workforce.

Positive Outlook for ITS Job Market



Source: Sizing the U.S. and North American Intelligent Transportation Systems Market: Market Data Analysis of ITS Revenues and Employment. The Intelligent Transportation Society of America. August 2011.

What is the ITS JPO PCB Doing to Help?

- Developing New Learning Resources
- ITS PCB Future Plans
- Research Needs

Vision: To develop an ITS profession that leads the world in innovative use of ITS technologies

Developing New Learning Resources

- ITS Resources for problem-based learning:
  - ePrimer – online December 2013
  - ITS Case Studies
    - Adaptive Signal Control
    - National Architecture
- Online learning:
  - ITS Standards – 36 modules
  - ITS Transit Standards – coming soon
  - New eLearning Courses from CITE:
    - Telecommunications and Networking Fundamentals
    - Network Design and Deployment Considerations for ITS Managers
  - Professional Certificate programs:
    - ITS Project Management
    - Traffic Engineering and Operations
    - ITS Systems
    - Road Weather Management

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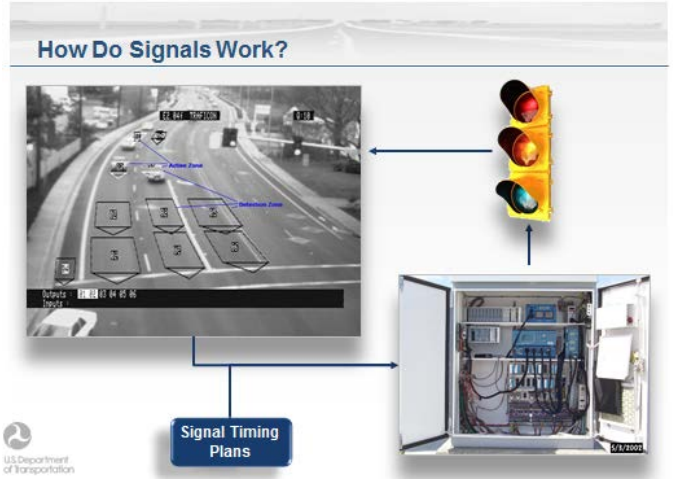

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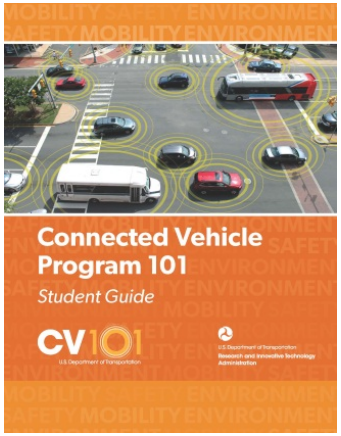
Developing New Learning Resources

- Expanded T3 program, with improved T3 archive
- Expanded workshops at ITS America state chapter meetings
  - Connected Vehicle 101
  - ICM, Procurement, Improving Safety
  - Student participation welcome
- University Workshop, Sept. 2013 and Fall 2014



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ITS PCB Future Plans

- Develop three credit introductory ITS course
  - Online or instructor-led
  - Course designs for undergraduate and graduate civil engineering students
- Develop an ITS curriculum using the skills and competency structure
  - Supplemented by ITS learning resources
- Develop additional ITS resources for problem based-learning
  - Additional ITS PCB case studies
  - Guest lecture videos
- Develop pilot with a university to offer credit for an online ITS course
- Continue dialogue with Operations Center of Excellence
- Continue dialogue with university partners – **Fall 2014 workshop**

Research Needs

- Gather data on:
  - ITS skills and competencies needed by public and private sector employers
  - Current and future hiring needs
- Update and expand ITS Competencies and Skills table categories:
  - Include next generation ITS technologies (connected / autonomous vehicles)
  - Add ITS-related professional competency areas (standards, communication and collaboration)
- Provide guidance on updated ITS Competencies and Skills tables:
  - For academic institutions, learning providers, and instructional designers
  - To inform development, and delivery of education and training courses and programs.

Contact Information

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