

**University Partners Webinar**  
**ITS Professional Capacity Building (PCB)**  
**Program**

March 21, 2012

Mac Lister  
ITS Joint Program Office  
ITS PCB Program Manager

# Agenda

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- Welcome
- Webinar Process and Desired Outcomes
- Who is in the Audience?
- ITS PCB Program
- ITS Education Outreach
- Educational Program Models Discussion
- Question and Answers
- Next Steps

See the ITS PCB website at: [www.pcb.its.dot.gov](http://www.pcb.its.dot.gov)

See the ITS JPO website at: <http://www.its.dot.gov>

# Webinar Process and Desired Outcomes

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## Webinar Process

- Discuss ITS PCB Program activities.
- Discuss challenges for teaching ITS subjects that we learned about during our outreach, and to collect your input on this.
- Highlight program models that could be used to advance ITS knowledge.
- Participate in polls to vote on program models and subjects that interest you most.

## Desired Outcomes

- Strengthen the basis for partnership between ITS PCB Program and Universities.
- Develop a set of activities that ITS PCB Program may move forward in 2012-2013 to promote ITS education in universities.

# Who is in the Audience?

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## Poll

Who is in the audience?

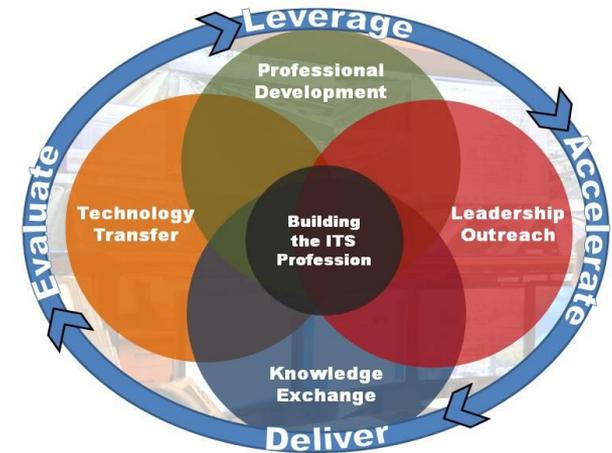
- a) Academic- Faculty
- b) Academic- Student
- c) State/Local DOT employee
- d) Federal employee
- e) Consultant
- f) Other? – *Please use the chat box!*



# ITS PCB Program

## Overview of ITS PCB Program Activities

- **Knowledge and Technology Transfer Strategies**
  - T3 Webinars
  - Online modular courses (CITE)
  - Video library (Spring-Summer 2012)
  - ePrimer (2012-2013)
  - Connected Vehicle outreach
  - Inter-modal collaborative programs
  - Knowledge Resources Database
- **ITS Standards Training**
  - 18 Modules completed (19 others under development)
  - Free web based training
- **Workshops and Presentations**
  - ITS America state chapter meetings
  - ITS World Congress
  - And more...



# ITS PCB Program

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



# ITS PCB Program



## Strategic Plan Program Goals

- **ITS Professional Development** – Equip current and emerging ITS professionals with the knowledge, skills, and abilities needed to plan, design, deploy, operate, and maintain ITS technologies.
- **Leadership Outreach** – Develop a network of champions who promote the value of ITS.
- **Knowledge Exchange** – Facilitate the exchange of knowledge and innovative ITS solutions.
- **Technology Transfer** – Accelerate technology transfer to bring ITS research and proven solutions to the user community.

# ITS PCB Program

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## Strategic Plan Goal 1: Professional Development

Equip current and emerging ITS professionals with the knowledge, skills, and abilities to plan, design, deploy, and operate ITS solutions.



### Objectives:

- 1.1 Determine core competencies for the ITS professional.
- 1.2 Create baseline ITS curriculum and/or model ITS programs.
- 1.3 Facilitate the incorporation of ITS training into academic programs.
- 1.4 Provide ITS continuous learning.

# ITS PCB Program

## ITS Strategic Plan Objective 1.3 - Facilitate the incorporation of ITS training into academic programs.

- Developed ITS for Students website (Fall 2011).
- Conducted university educator interviews and researched potential pilot educational program models (Fall 2011).
- Organized ITS World Congress Student Day (October 2011).
- Held a workshop with university educators - University Partners Workshop (January 2012).
- Participating in US DOT National Transportation Workforce Summit (April 24-26, 2012)
  - See: <http://www.cutcworkforce.com>
- Planning a student day for ITS America Annual Meeting (May 21-23, 2012).
  - See: <http://www.itsa.org>



ITS PCB website student section



ITS America Student Day



# ITS PCB Program

## Program Content by Tier

### Tier 1: Emerging Technologies

- Connected Vehicle:
  - V2V
  - V2I
  - Safety Pilot
    - Real Time Data Capture & Mgmt.
    - DMA
    - AERIS
    - Road Weather
- Technology
- Policy

### Tier 2: Current Research

- Short-term Intermodal Research
- Research Initiatives
  - ICM
  - MSAA
  - Clarus
  - IVBSS
  - EFM
  - Smart Roadside

### Tier 3: Existing Technologies

- Arterial Management
- Freeway Management
- Crash Prevention & Safety
- Road Weather Management
- Roadway Ops & Maintenance
- 9 others

### Tier 4: Cross-Cutting

- ITS Standards
- ITS Architecture
- Systems Engineering
- Data Communications
- DSRC
- Data Collection & Mgmt.
- Security
- Data Communications
- Performance measures



# Tier 1: Emerging Technologies

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## Connected Vehicle Research Program

- Develop training around Connected Vehicle Core System Architecture (2012).
- Leverage ITS Test Bed/Safety pilots.



# Tier 2: Current Research

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## Short-term Intermodal Research

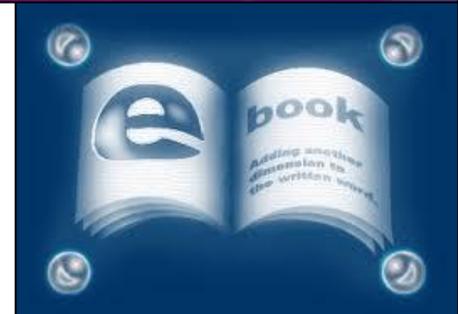
- Integrated Corridor Management (ICM)
- Active Transportation Demand Management (ATDM)
- Mobility Services for All Americans (MSAA)



# Tier 3: Existing Technologies

## Deployed Technologies

- Arterial Management
  - Freeway Management
  - Crash Prevention & Safety
  - Road Weather Management
  - Roadway Operations & Maintenance
  - Transit
  - And others...
- └─┬─┘
- CITE Courses
  - T3s – Talking Transportation Technology
  - ITS ePrimer
  - ITS Video Library



# Tier 4: Foundational Courses

## ITS Standards Training

- Recorded and archived first 18 modules by January 2012.
- Contracted with ITE to produce next 19 modules in 2012.
  - Focus on more interactive presentation materials.
- Extend standards training into transit.
- Seek additional cost effective live training locations (e.g. ITS America state chapter meetings).

A screenshot of the ITS Standards Training website. The page has a navigation bar with links like "About RITA", "Communities of Interest", "Contact Us", "Press Room", "RITA Offices", and "Site Map". Below the navigation is a search bar and a breadcrumb trail "PCB Home > Training Overview". The main heading is "ITS Standards Training Modules". A paragraph states: "The ITS PCB Program is pleased to offer FREE training on ITS standards! Learn how to evaluate, procure, and implement standards-based ITS devices and systems." Below this is a "Get Started!" section with a table of modules. The table has columns for "Module", "Description", and "Status". The first row shows "Module 1" with a description of ITS standards and a status of "Available". The second row shows "Module 2" with a description of ITS standards and a status of "Under Development".

**ITS Standards Training Modules**

The ITS PCB Program is pleased to offer **FREE** training on ITS standards! Learn how to evaluate, procure, and implement standards-based ITS devices and systems.

The ITS Professional Capacity Building Program (ITS PCB) is offering free online ITS standards training. The 18-module series is aimed at practitioners in state and local highway agencies and transit agencies who seek the skills needed to procure, implement, and operate ITS standards-based devices and equipment. Consultants, system designers and integrators, and system testers will also find the training informative and are welcome to view the modules. **Modules are free and can be viewed anytime on the ITS PCB website!**

[New to ITS Standards? Learn about ITS standards.](#)

Module	Description	Status
1	It is important that ITS employers and other ITS practitioners understand the advantages of using standards in their ITS deployments. The consistent and widespread use of standards will enable public agencies and private organizations to share information across disparate networks, resulting in the improved coordination and delivery of transportation services on a regional basis, and, collectively, to a safer and more efficient national transportation network. <a href="#">Read more</a>	Available
2		Under Development

# ITS PCB Program



## Poll

What tier are you are most interested in?

- a) Tier 1
- b) Tier 2
- c) Tier 3
- d) Tier 4



# ITS PCB Program



## Poll

In Tier 4, what is the ITS foundational area you are most interested in?

- a) ITS Standards/ ITS Architecture
- b) Systems Engineering
- c) Data Communications/DSRC
- d) Data Collection and Management
- e) Security
- f) Performance Measures
- g) Others? – *Please use the chat box!*

### Tier 4: Cross-Cutting

- ITS Standards
- ITS Architecture
- Systems Engineering
- Data Communications
- DSRC
- Data Collection & Mgmt.
- Security
- Performance measures



# ITS Education Outreach

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## What

- Interviews with ITS faculty conducted in Fall 2010.
- University Partners Workshop with ITS faculty conducted in January 2012.
- University Partners Webinar - today!

## Purpose

- Discuss **challenges** associated with delivering ITS education.
- Learn about and discuss **educational program models** that expose students to ITS learning.
- Understand the current state of ITS education activities within universities.
- Explore potential partnership opportunities with universities.



# ITS Education Outreach

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## Outreach Findings - Challenges

- Amending a university curriculum is very difficult.
- Current ITS education is mostly focused in the field of engineering.
- Attracting and exposing students to ITS early in their academic careers is difficult.
- Collaborating across academic departments and with the public/private sector may be challenging.
- Creating new programs requires extra funding investments.
- Current ITS textbooks are outdated, or not readily available.
- Sharing of ITS educational resources among academic institutions could be more widespread.



# ITS Education Outreach

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## Outreach Findings – Challenges



***“There are not enough undergraduate course offerings for ITS.”***

– Peter T. Martin, Utah



***“The understanding of how the technology actually works is a huge need - the front end installation and development.”***

– Jill Hough, NDSU



***“Academic institutions have a goal of making their students competitive; but this needs to be based on collaboration (among university departments, and among the public/private sector).”***

– Jeanne Girard, UMI



***“There are simply too many new and emerging ITS topics to cover in a one or two semester class.”***

– Kathy Frankle, UMD



# ITS Education Outreach

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## Outreach Findings – Challenges

### Poll

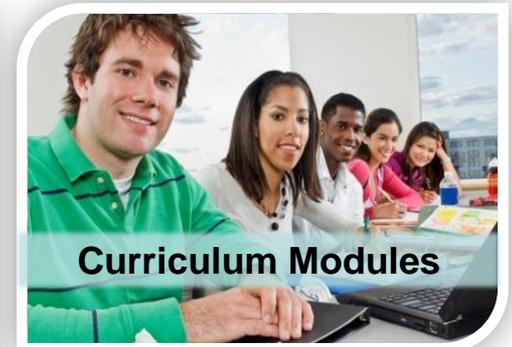
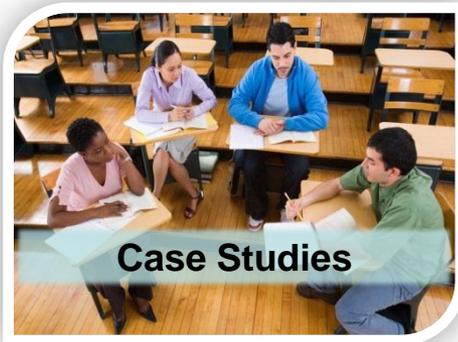
What are your top three challenges as a student or professor accessing or teaching ITS education?

- a) Amending a university curriculum is difficult.
- b) Current ITS education is focused in the field of engineering.
- c) Attracting students to ITS early in their academic careers
- d) Collaborating across academic departments and with the public/private sector.
- e) Developing new programs calls for more funding.
- f) Current ITS textbooks are outdated, or not readily available.
- g) Sharing of ITS educational resources among academic institutions is not widespread.
- h) Others? Please use chat box.



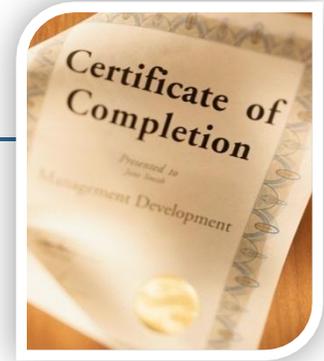
# Educational Program Models Discussion

## Outreach Findings – Educational Program Models



# Certificate Programs

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## Description

An ITS focused, academic training program designed for degree or non-degree students seeking targeted education in ITS core subject areas and other subject areas such as design, deployment, maintenance, and operations of ITS networks.

## Certificate programs can...

- ✓ Have fewer course requirements than formal degree programs.
- ✓ Prepare students to work in other areas within their profession.
- ✓ Range in length and completion time, depending on the subject.
- ✓ May exist completely on line.



# Certificate Programs

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## Benefits

- Allow students to pursue education while working full time.
- Are often designed specifically to meet industry needs, as well as to reach niche markets.

## Challenges

- May not fill all employment requirements.
- May not be recognized as a true credential.
- Are not always accredited.



# Certificate Programs

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## Poll

**This type of ITS-focused program would be successful at my university.**

- a) Strongly agree
- b) Agree
- c) Not sure
- d) Disagree
- e) Strongly disagree



# Case Studies



## Description

Short, story-based problems that provide students with in-depth examination of an ITS approach taken by a specific community to explore real-life transportation issues addressed by ITS applications.

## Case studies can...

- ✓ Provide short, quick, exciting, exposure to ITS or an ITS related problem.
- ✓ Offer complicated case studies with scenarios, or problems to solve.
- ✓ Revolve around a theme, such as building an imaginary city, ITS architecture, standards, and cost benefit analysis.
- ✓ Introduce students to a problem that raises societal, political, ethical, and economic issues.
- ✓ Introduce students to data gathering, data analysis, and problem solving.



# Case Studies

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## Benefits

- Supports interactive learning.
- Lets students know what they would be doing and what they would need to know, gives them a taste/flavor what professionals do.
- Shows that transportation as a career is not one-dimensional.
- Opportunity for university-transportation agency partnership to develop.

## Challenges

- University professors would need guidance on how to grade.
- Not clear on who would develop, and how they would be compensated.
- Additional instruction time required.



# Case Studies

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## Poll

Please provide responses to the following statements about this program model:

**This type of ITS-focused program would be successful at my university.**

- a) Strongly agree
- b) Agree
- c) Not sure
- d) Disagree
- e) Strongly disagree



# Internships

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## Description

Internships are short-term employment opportunities intended to provide undergraduate and graduate students with professional work experience to help them explore future career options.

## Internships can...

- ✓ Offer a way to test the waters of a career field.
- ✓ Benefit the intern when it provides hands-on project work.
- ✓ Provide on-the-job training.
- ✓ Be paid or unpaid.



# Internships

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## Benefits

- Develops partnerships between universities and transportation agencies.
- Offers students insight into future employment.
- Provides students with possible income and/or course credit.
- Gives employers a preview of student capabilities before employing them.

## Challenges

- Difficult to set up in remote areas.
- Unpaid internships predominate.



# Internships

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## Poll

Please provide responses to the following statements about this program model:

**This type of ITS-focused program would be successful at my university.**

- a) Strongly agree
- b) Agree
- c) Not sure
- d) Disagree
- e) Strongly disagree



# Capstone Projects

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## Description

Capstone Projects are intended to be intensive, active learning projects, requiring significant effort in the planning and preparation of a substantial final work product. Projects provide practical real world experiences to students. Students typically work in multidisciplinary teams to carry out tasks involved in solving an ITS related engineering project.

## Capstone projects can...

- ✓ Be incorporated into existing courses like a senior design course
- ✓ Offer the opportunity to work on a project from start to finish
- ✓ Engage industry partners
- ✓ Provide students with real world experience and further develop student communication skills



# Capstone Projects

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## Benefits

- Provides real-world experience and experience with teamwork
- Meets accreditation objectives
- Offers active participative learning
- Valuable for university and industry partner
- Attracts career oriented students

## Challenges

- Takes effort for faculty to organize and structure
- May be labor intensive, requiring a heavy student workload
- Coordination between faculty and industry may be challenging



# Capstone Projects

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## Poll

Please provide responses to the following statements about this program model:

**This type of ITS-focused program would be successful at my university.**

- a) Strongly agree
- b) Agree
- c) Not sure
- d) Disagree
- e) Strongly disagree



# Competitions/Challenges

## Description

A multi-disciplinary based design competition for teams to develop solutions to specific transportation related issues or problems using emerging ITS technology.



## Competitions/challenges can...

- ✓ Respond creatively and quickly to pressing challenges.
- ✓ Offer students a competitive real-world environment.
- ✓ Provide students and universities with acknowledgement and a source of pride.
- ✓ Offer unique partnership opportunities among universities and the private sector.



# Competitions/Challenges

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## Benefits

- Engages students that want to solve real-world problems.
- Helps to draw in multidisciplinary teams of students other than civil engineers.

## Challenges

- Incentives for students participate needs to be substantial.
- May compete with other student/faculty coursework or responsibilities unless the program provides course or teaching credit.



# Competitions/Challenges

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## Poll

Please provide responses to the following statements about this program model:

**This type of ITS-focused program would be successful at my university.**

- a) Strongly agree
- b) Agree
- c) Not sure
- d) Disagree
- e) Strongly disagree



# Mentorships



## Description

A mentor program designed to develop a professional relationship between a person with ITS experience (the mentor) and a student (the mentee) to develop a specific skill set and knowledge base that will enhance the student's professional and personal growth.

## Mentorships can...

- ✓ Develop relationships among universities, industries, and alumni
- ✓ Offer soft skills development for students
- ✓ Build professional relationships and networks for students
- ✓ Be offered at various levels throughout a student's academic career



# Mentorships

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## Benefits

- Connects profession/employers with students.
- Provides the potential for students to receive jobs from industry.
- Offers students insight into profession/ good recruiting tool to profession.
- Allows students to get a taste of what real world transportation engineers do and the challenges they face.

## Challenges

- May be too few mentors in rural areas.
- May work better if mentors are local.
- May be time consuming for faculty.



# Mentorships

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## Poll

Please provide responses to the following statements about this program model:

**This type of ITS-focused program would be successful at my university.**

- a) Strongly agree
- b) Agree
- c) Not sure
- d) Disagree
- e) Strongly disagree



# Boot Camps

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## Description

An intensive 1-2 week educational program designed to provide ITS specific coursework combined with field applications exercises and lab work.



## Boot camps can...

- ✓ Be held outside of the academic calendar during summer or holiday breaks.
- ✓ Use existing ITS test bed locations across the country to provide hands-on in the field experience.
- ✓ Require pre-requisite course-work or a declaration of an academic major for admittance.
- ✓ Include partnerships with federal, state, and private agency sponsors.



# Boot Camps

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## Benefits

- Provides targeted, condensed instruction.
- Increases awareness of technologies.
- Offers inter-disciplinary experience.
- Can utilize experts from industry.

## Challenges

- May compete with community colleges and vocational schools.
- May be better for professionals needing targeted experience.
- May not provide enough time for in-depth instruction for certain subjects.



# Boot Camps

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## Poll

Please provide responses to the following statements about this program model:

**This type of ITS-focused program would be successful at my university.**

- a) Strongly agree
- b) Agree
- c) Not sure
- d) Disagree
- e) Strongly disagree



# Curriculum Modules

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## Description

A series of ITS course modules for use by a wide range of university departments; offered online for free and applicable for course credit by participating universities.

## Curriculum modules can...

- ✓ Be provided in an e-learning format.
- ✓ Be made available on website for free download in a searchable database.
- ✓ Be used to augment existing university curricula.
- ✓ Provide a data bank of test problems for different course categories and different audiences.



# Curriculum Modules

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## Benefits

- Provides modules in areas that may not be the strength of the instructor
- Encourages integration of ITS into program
- Reduces preparation burden on faculty allowing more likely integration into courses
- Allow standardized materials to be taught - consistent information
- Allow university faculty to pick appropriate topics to fit into curriculum

## Challenges

- May be considered too traditional, and may not excite students
- May become outdated quickly, and difficult to update



# Curriculum Modules

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## Poll

Please provide responses to the following statements about this program model:

**This type of ITS-focused program would be successful at my university.**

- a) Strongly agree
- b) Agree
- c) Not sure
- d) Disagree
- e) Strongly disagree



# All program models

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## Poll

### Faculty only!

Select the top three models you prefer most for delivering ITS education.

- a) Certificate Programs
- b) Case Studies
- c) Internships
- d) Capstone Projects
- e) Competitions/Challenges
- f) Mentorships
- g) Boot Camps
- h) Curriculum Modules
- i) Others? *Please use chat box.*



# All program models

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## Poll

### Students only!

Select the top three models you prefer most for delivering ITS education.

- a) Certificate Programs
- b) Case Studies
- c) Internships
- d) Capstone Projects
- e) Competitions/Challenges
- f) Mentorships
- g) Boot Camps
- h) Curriculum Modules
- i) Others? Please use chat box.



# Next Steps

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## Next Steps

### For us:

- Compile the results from today's webinar to develop partnership opportunities with the university community.
- Develop a set of activities that ITS PCB Program may move forward in 2012-2013.

### For you:

- Email questions to the ITS PCB Program at: [T3@dot.gov](mailto:T3@dot.gov)
- Check with the ITS PCB website for a summary of this meeting and to explore other educational resources.
  - See: <http://www.pcb.its.gov.com>



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# THANK YOU!!

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