ITS AMERICA ANNUAL CONFERENCE

PUTTING PEOPLE FIRST:
ITS IS SMART COMMUNITIES AND CITIES

December 2021

U.S. Department of Transportation

Intelligent Transportation Systems
Joint Program Office

INTRODUCTION - PANELIST

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MOVING FORWARD: PUTTING PEOPLE FIRST

PUTTING PEOPLE FIRST: SMART CITIES AND COMMUNITIES

The report covers the benefits, goals, challenges, and success factors associated with smart cities and communities and gives a glimpse of a path forward.

https://its.dot.gov/smartcities/SmartCities.pdf

What Are Smart Cities and Communities (SC&Cs)?

SC&Cs use advanced information and communications technologies to find new ways to solve age-old problems like potholes and pollution, traffic and parking, public health and safety, and equity and public engagement.

SC&C Benefits

SC&C solutions support safer and healthier communities by improving traffic safety and emergency response, improving access to health care, supporting active modes of transportation, and identifying and addressing emissions hot spots.

HEALTH AND SAFETY

SC&C solutions are leading the way to a zero-emissions future by improving traffic flows, installing electric vehicle infrastructure, and converting public fleets and buses to electric vehicles.

CLIMATE CHANGE

OPEN GOVERNMENT

SC&C solutions provide new pathways and platforms for citizen engagement by creating open-data portals; breaking down silos; and enabling more responsive, integrated, data-driven municipal services.

EQUITY

SC&C solutions increase access to opportunity by making technologies more accessible and affordable; improving access to broadband and wireless services; connecting underserved communities to employment, amenities, and services by providing affordable, reliable transportation options; and bridging the digital divide.

MOBILITY

SC&C solutions support better mobility choices, improving the quality and reliability of transit services, enhancing pedestrian and bicycle infrastructure, and making better use of the space allocated to parking.

ECONOMIC GROWTH

SC&C solutions improve access to employment and, by reducing congestion and improving truck routing, parking, and curbside management, make it possible for goods to be delivered to homes and businesses safely, reliably, and efficiently.

What Is DOT's Role in Supporting SC&Cs?

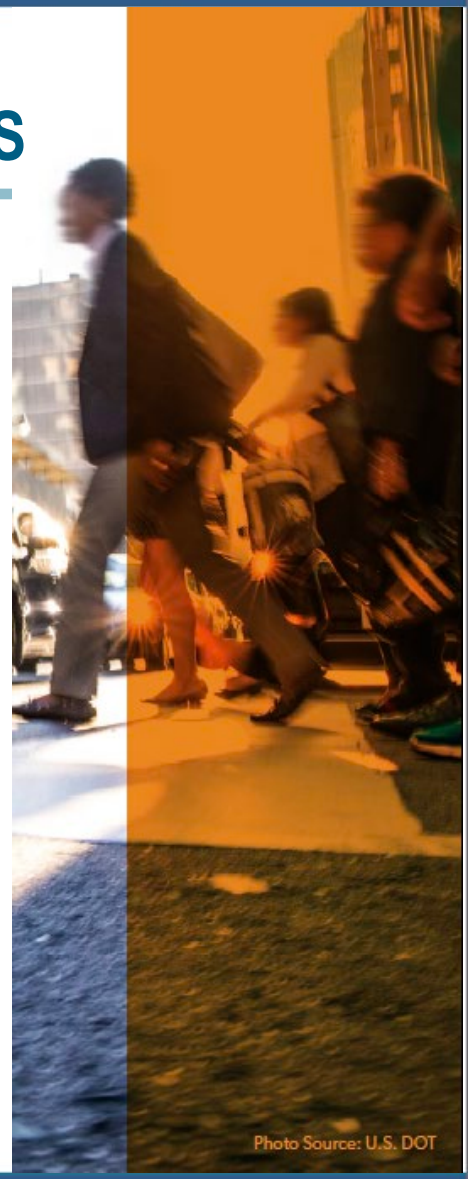
- The U.S. DOT has awarded millions of dollars in grants to support community-driven, advanced-technology transportation projects to fight congestion, increase connectivity, and improve access to opportunity.
- As SC&C solutions evolve, the U.S. DOT is working to speed the transformation of research, prototypes, and pilots into market-ready technologies and, ultimately, widespread deployment by preparing the public sector to address challenges associated with their adoption.
- The U.S. DOT provides communication and education to facilitate awareness, understanding, acceptance, adoption, and deployment of ITS technologies.

Success Factors

- Set clear goals
- Break down silos
- Use a structured engineering approach
- Speak the same language
- Foster a culture of innovation
- Engage citizens
- Explore with living labs
- Partner strategically

How SC&Cs Are Tackling Their Transportation Challenges

- Safety
- Curb management
- Mobility justice
- Congestion
- Energy efficiency and pollution
- Responsive government services

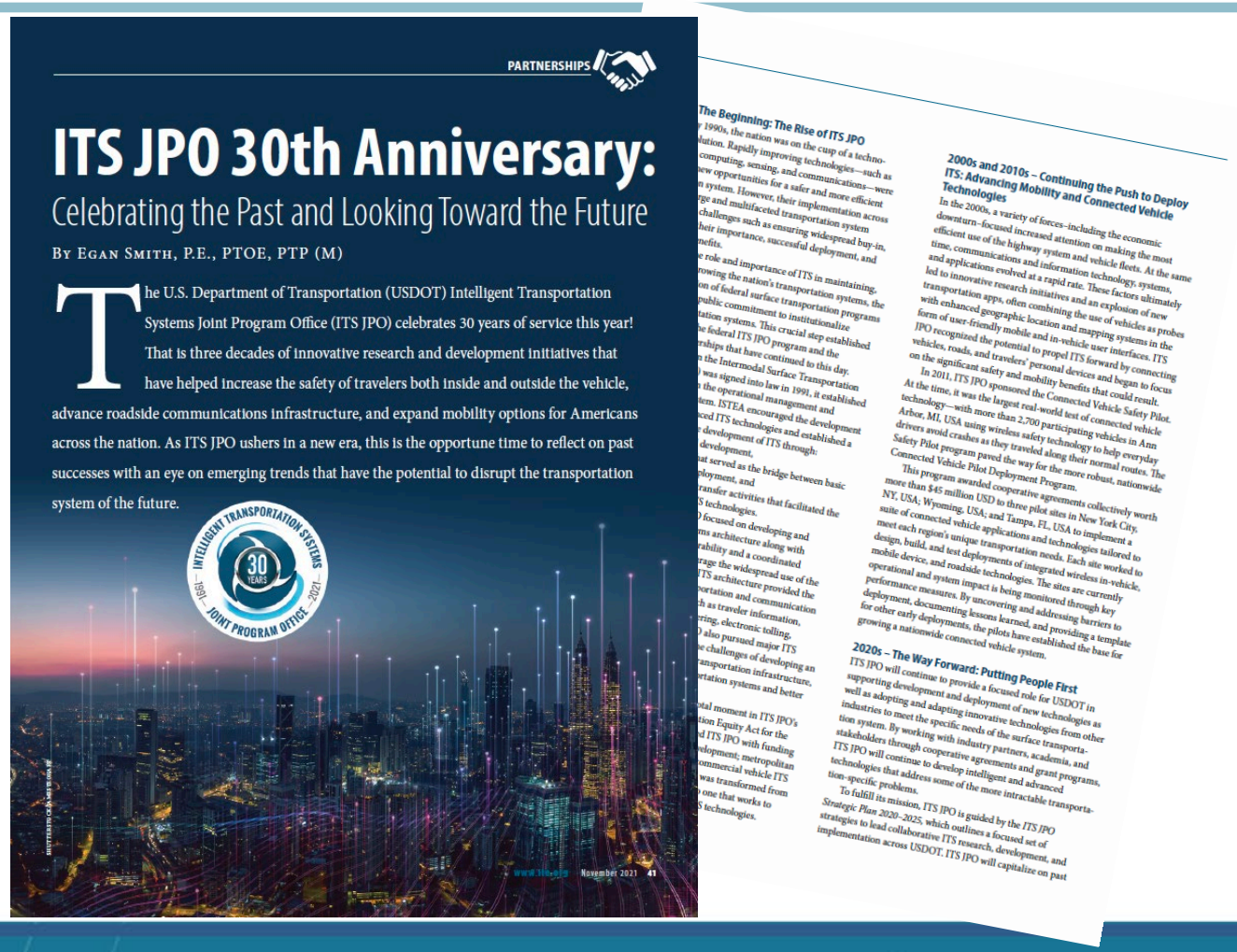


U.S. DOT's Intelligent Transportation Systems Joint Program Office

The ITS JPO's role is to coordinate the U.S. DOT's ITS research and deployment portfolio.

ITS JPO 30TH ANNIVERSARY

Celebrating the past and looking toward the future……November ITE Journal



PARTNERSHIPS

ITS JPO 30th Anniversary:

Celebrating the Past and Looking Toward the Future

By Egan Smith, P.E., PTOE, PTP (M)

The U.S. Department of Transportation (USDOT) Intelligent Transportation Systems Joint Program Office (ITS JPO) celebrates 30 years of service this year! That is three decades of innovative research and development initiatives that have helped increase the safety of travelers both inside and outside the vehicle, advance roadside communications infrastructure, and expand mobility options for Americans across the nation. As ITS JPO ushers in a new era, this is the opportune time to reflect on past successes with an eye on emerging trends that have the potential to disrupt the transportation system of the future.

The Beginning: The Rise of ITS JPO

2000s and 2010s – Continuing the Push to Deploy ITS: Advancing Mobility and Connected Vehicle Technologies

2020s – The Way Forward: Putting People First

ITS JPO Research Programs

ITS4US Deployment Program

COMPLETE TRIP

ITS4US

Program Overview

- A USDOT Multimodal Deployment effort, led by ITS JPO and supported by OST, FHWA and FTA
- Supports multiple large-scale replicable deployments to address the challenges of planning and executing all segments of a complete trip

> ***Vision***
>
> *Innovative and integrated **complete trip deployments** to support seamless travel for all users across **all modes**, regardless of **location, income, or disability***

The Complete Trip Concept

Complete Trip: An individual's ability to go from origin to destination reliably, spontaneously, confidently, independently, safely, and efficiently without gaps in the travel chain.

Source: USDOT

Complete Trip Deployment Concept: Fundamental Elements

- Complete Trip deployments will be real-world environment ***deployments***
  - *Serve as replicable models and remain in operation*
- There are ***multiple*** Complete Trip deployments
  - *Unique solutions to address critical, local challenges*
- Complete Trip deployments are expected to be both ***large-scale and multi-modal***
  - ***Large-scale*** implies deployments will have measurable impact
  - Sites will deploy ***multiple technologies and modes***

Program Goals

- Spur high-impact integrated Complete Trip deployments nationwide
- Identify needs and challenges by populations
- Develop and deploy mobility solutions that meet user needs
- Measure impact of integrated deployments
- Identify replicable solutions and disseminate lessons learned

Deployment Phases

Pre-deployment Activities

- Define Program Vision and Mission
- Organize Multimodal Federal Team
- Phase 1 Procurement Planning
- Phase 1 Contract Awards

PHASE 1: Deployment Concept

- Concept Development for Complete Trip Deployments
- Establish Roundtables
- Phase 2/3 Procurement Planning
- Phase 2/3 Cooperative Agreement Awards

PHASE 2: Design & Test

- Design, Test and Deploy Complete Trip Solutions
- Evaluation Framework and Planning

PHASE 3: Operate & Evaluate

- Demonstrate Multiple Large-Scale Deployments
- Evaluate Deployments
- Share Data & Lessons Learned

Operations & Maintenance

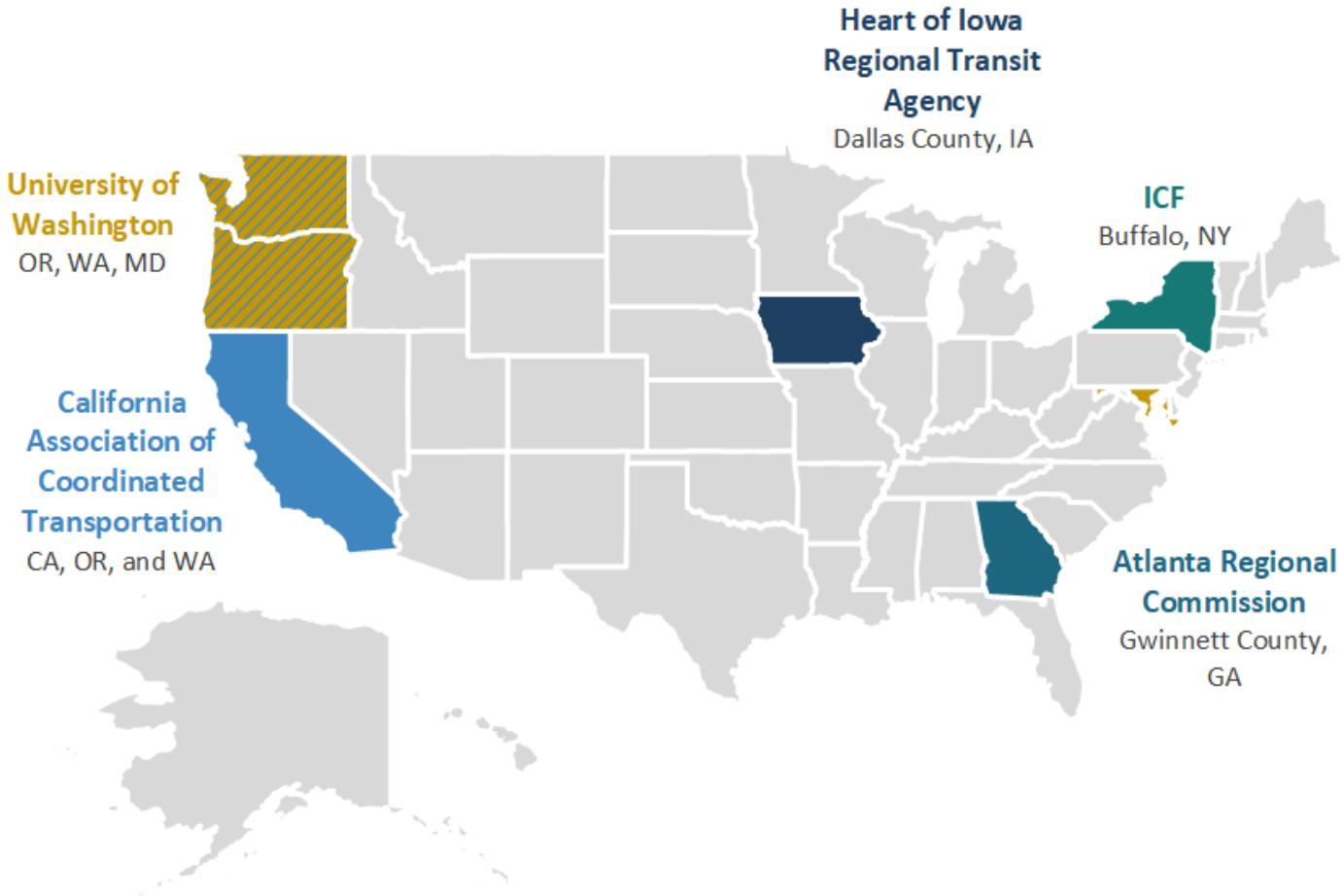
- Sustain operations for a minimum period of five years after the program is completed with no supplementary federal funds

Pre-Deployment — *18 months*

Deployment — *Up to 12 months* | *Up to 24 months* | *Minimum of 18 months*

Post-Deployment — *5 years*

Phase 1 Awardees



Project Overviews

ARC - Safe Trips in Connected Transportation Network

Improve personalized trip planning, indoor/outdoor navigation, and the connection between trip segments by integrating CV data with an open-source web-based and mobile application.

CALACT - Plan, Book, & Pay for Demand-Responsive Transit Agencies

Adopt a common framework for data publication, encourage use of accessibility-focused data specifications, and develop open-source software tools to improve accessible trip planning.

HIRTA - Health Connector for the Most Vulnerable

Deploy emerging technologies to enable coordination of medical appointment scheduling with transportation services and support enhanced end-to-end traveler experience including wayfinding.

Projects Overview, continued

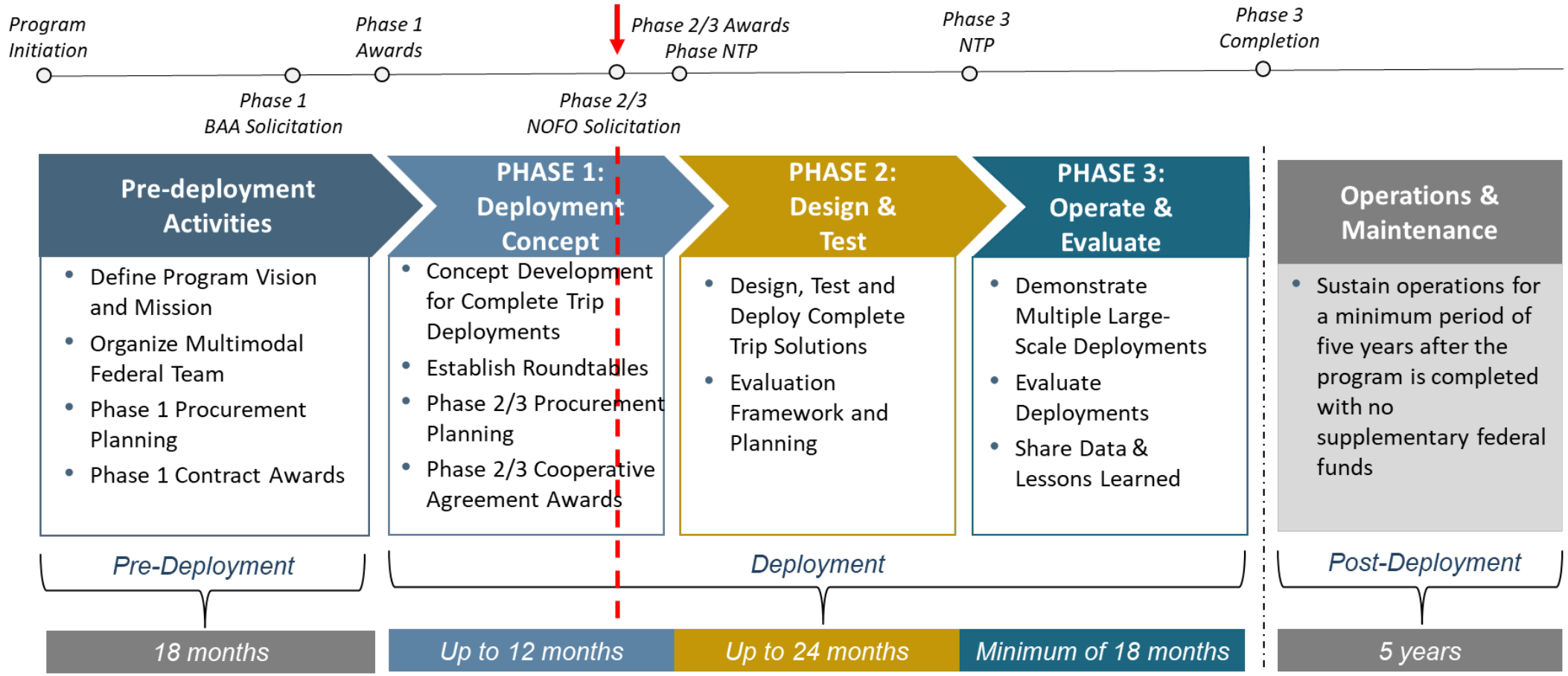
ICF-Buffalo - Complete Trip Deployment in Buffalo, NY

Deploy integrated travel support services and systems to improve mobility and accessibility including a complete trips platform app; an integrated automated shuttle service; and smart infrastructure technologies to assist travelers with disabilities.

UW - Accessible Mapping Standards and Data Collaboration Drive Accessible Multimodal Active Transportation and Mobility

Coordinate and support standardization of open-source data standards that enable a wide variety of mobility applications; power customized trip planning and visualization data; and create the data infrastructure necessary to scale collection and maintenance.

Current Status of the ITS4US Deployment Program



Concept Development Phase 1 Activities

- ✓ **Refine proposed approach**
  - ➢ Planning for Phase 2 and 3

- ✓ **Create a set of documents that:**
  - ✓ Define user needs, deployment scope and requirements;
  - ✓ Describe data and safety;
  - ✓ Identify performance measurement approach;
  - ✓ Outline outreach activities;
  - ➢ Address participant training and partnering arrangements
  - ➢ Describe preliminary complete trip deployment site plan.

- ✓ **Participate in cross-collaboration activities:**
  - ✓ Phase 1 Cohort Activities
  - ➢ Independent Evaluation

ITS4US Program: Doing it Right!

https://its.dot.gov/its4us/

Coordinated and Collaborative Multimodal Team

(OST, ITS JPO, FHWA, FTA: Planning, Research, Operations, Infrastructure, Safety, Civil Rights, Policy, Contracts, Modal and Regional Offices)

Required Planning Phase

(Rigorous SE Approach and Documentation)

Strong Technical Support

(SMEs, Supporting Materials, Trainings, Cross-site collaboration opportunities, Standards Support)

Extensive Stakeholder Outreach

(Site Plans, Trainings, Webinars, Industry Engagement)

Independent Evaluation

(Overseeing program and site-led evaluation)

ITS4US Phase 1 Outputs for Replicability

14 Deliverable training sessions

65 Published Plans

15 Documents for PMPs, Stakeholder Registries, and Needs Summaries

15 Public Webinars:

- ConOps
- Performance Measurement
- Deployment Plans

Knowledge Technology & Transfer

7 Pre-Award Webinars reached over **800** unique attendees and **360** different organizations

5 Site ConOps Webinars reached more than **500** unique registrants and **330** attendees.

5 Performance Measurement and **5** Deployment Plans Webinars

5 site-specific Outreach Plans

1 ITS4US Program Outreach Plan

- Program presentations and panel sessions at targeted national and regional conferences and meetings
- Program website: https://its.dot.gov/its4us/
- Program and site-specific videos
- Active social media presence
- Extensive coordination with other efforts including the Professional Capacity Building (PCB) Program

ITS4US Contact Information

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Visit the Complete Trip - ITS4US Deployment Program Website:

https://its.dot.gov/its4us/

ACCELERATING ITS DEPLOYMENT PROGRAM AREA: SUMMARY

ITS Deployment Evaluation

- ITS Benefits, Cost & Lessons Learned
- ITS Deployment Tracking
- Evaluation Resources & Performance Measures

ITS Professional Capacity Building

- T3 Webinars
- ITS Training
- ITS Technical Assistance
- Academic Initiatives

ITS Architecture & Standards

- ITS Architecture
- ITS Standards
- International Cooperation
- Emerging Technologies Monitoring

ITS Communications

- Targeted Resources
- News & Events
- Videos & Images
- Publication Guidelines

1196_041

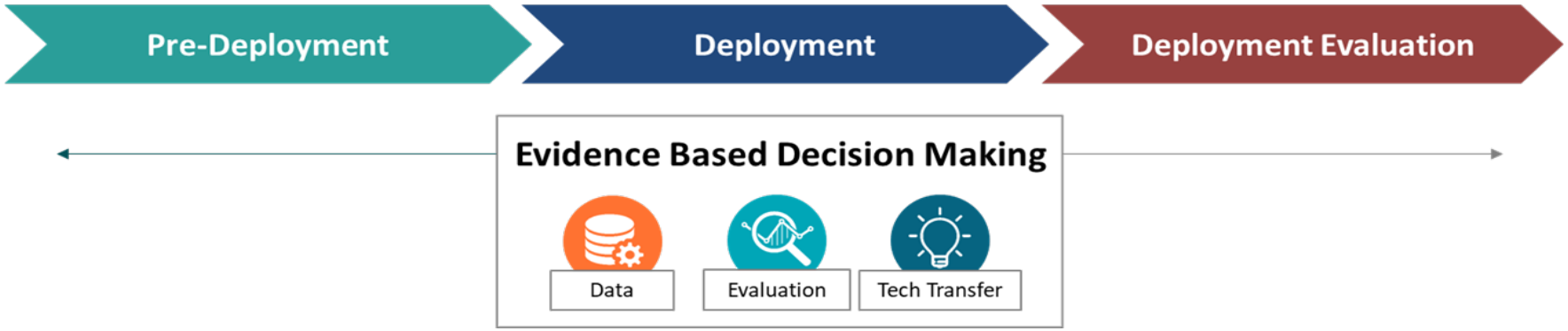
ACCELERATING ITS DEPLOYMENT PROGRAM AREA: SUMMARY

- The Accelerating Deployment Program Area is designed to **put people and communities first** by addressing a **full spectrum of stakeholder needs** related to the foundational elements of successful ITS deployment
- Provide the **research, analytics, training, and tools and services** to enable successful, efficient, and interoperable ITS deployments
- Maximize deployment **benefits** and enable positive **return on ITS investments**

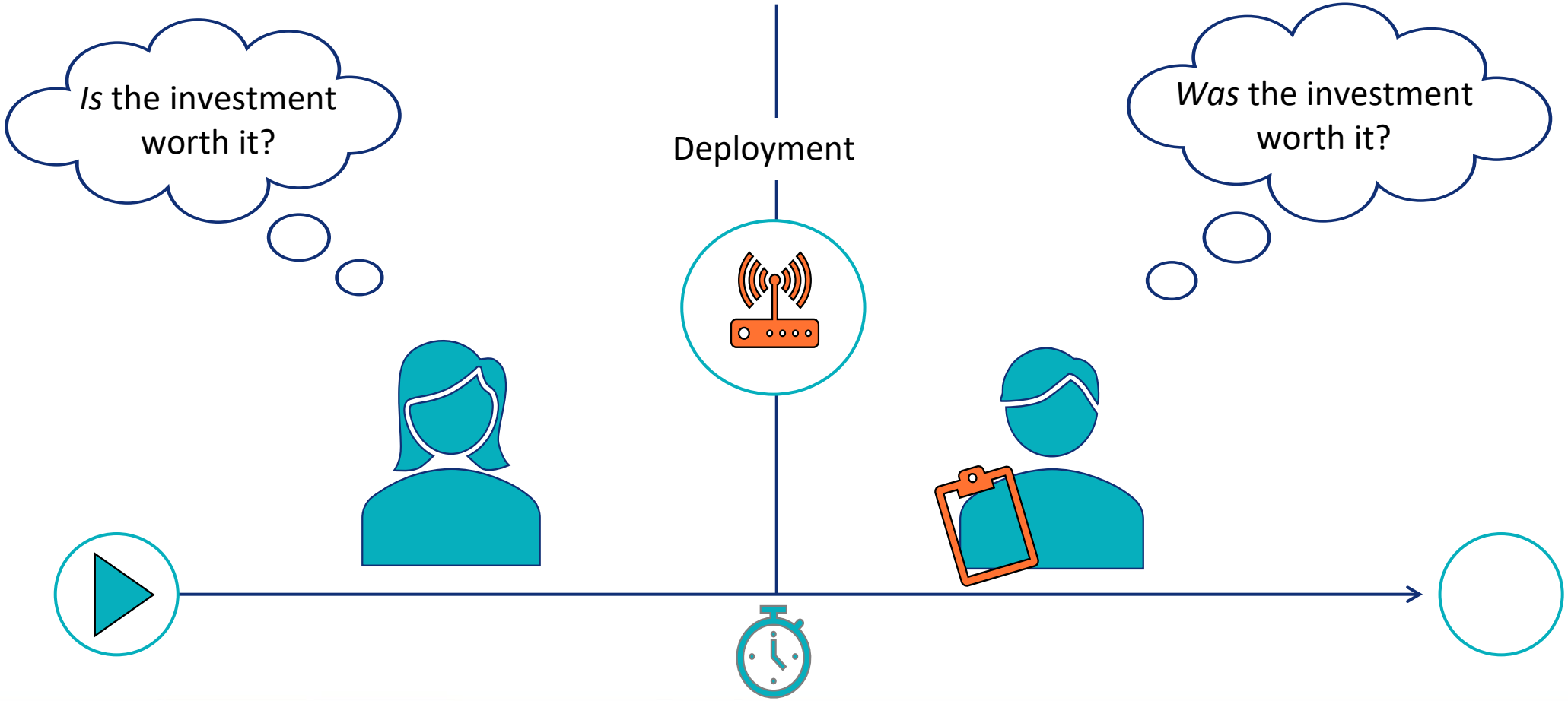
WHAT IS FULL ITS DEPLOYMENT LIFECYCLE SUPPORT?

Full ITS deployment lifecycle support includes:

- An integrated, leveraged **project-lifecycle** approach to accelerating and improving stakeholder investment in ITS technologies, applications, and services.
- Improving the **capability and capacity of stakeholders** to provide and receive deep technical assistance **to support and accelerate successful ITS deployment** at all stages of the effort.
- Supporting **evidence-based and data-driven decision making**.



WHAT IS FULL ITS DEPLOYMENT LIFECYCLE SUPPORT?

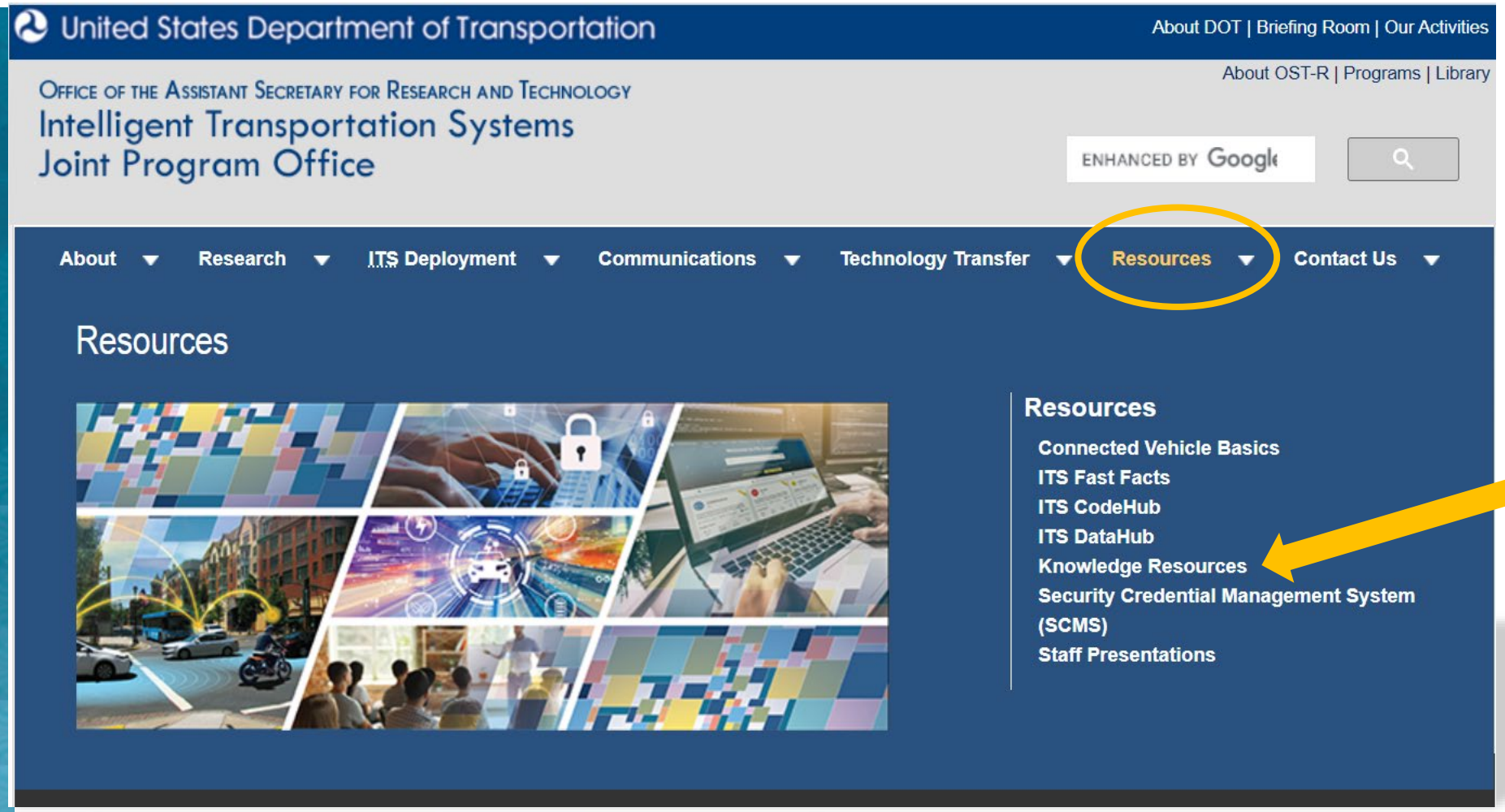


ITS DEPLOYMENT EVALUATION PROGRAM

- Evaluation is critical to understanding if ITS projects are serving a community's needs.
- The Program has been collecting, analyzing, and disseminating data from verified and reliable sources in the public sector for 25+ years.
- Support accelerating ITS deployment by providing ITS resources for a variety of users in the community:
  - Benefits, Costs, and Lessons Learned Databases
  - ITS Deployment Tracking Survey Data Repository
  - Decision Support Resources (e.g., Case Studies, Data Visualizations, Cost Plots, Executive Briefings)

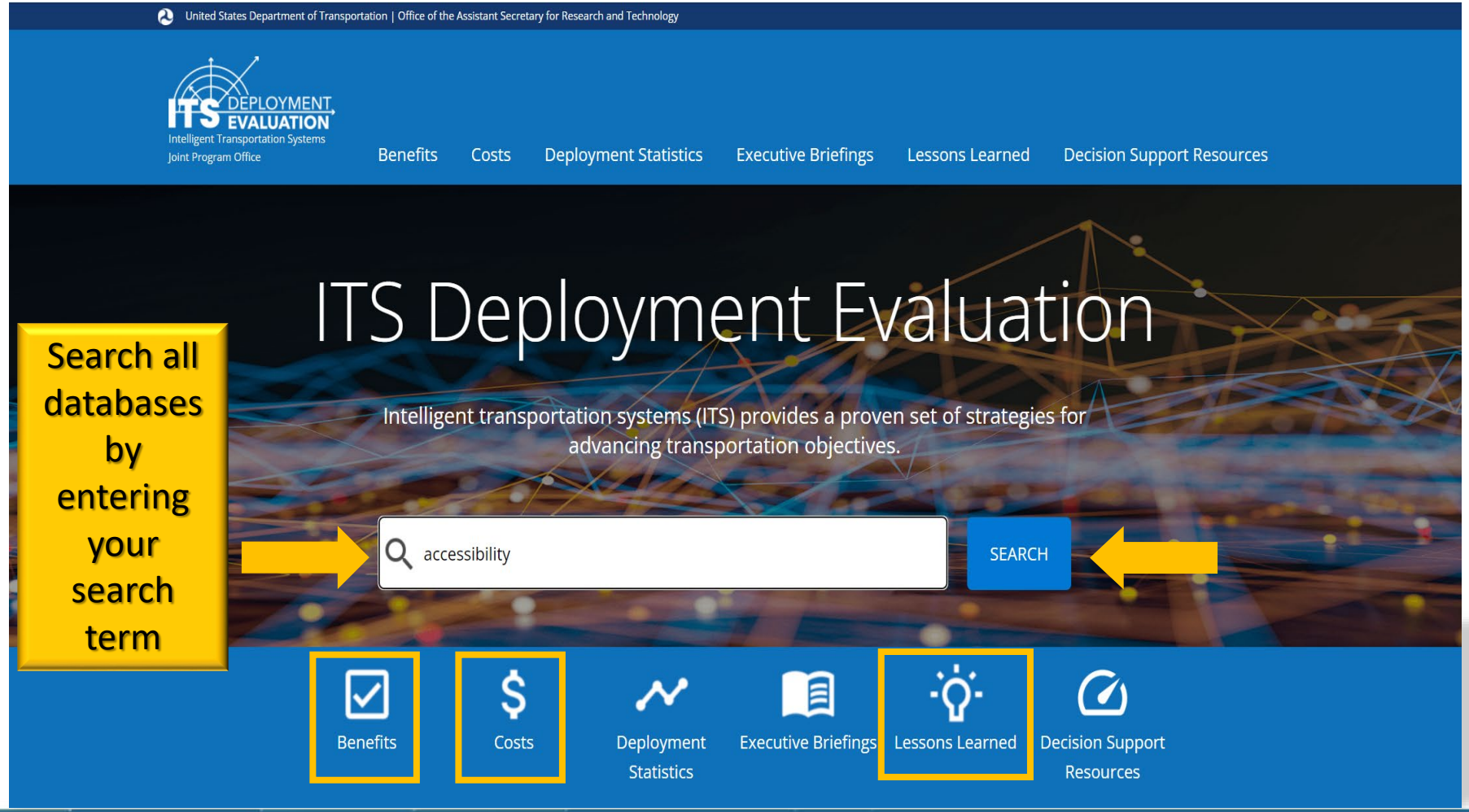
Source: iStock

ACCESSING EVALUATION DATA FROM THE ITS JPO HOME PAGE



www.its.dot.gov

USING THE EVALUATION DATABASES: OVERVIEW

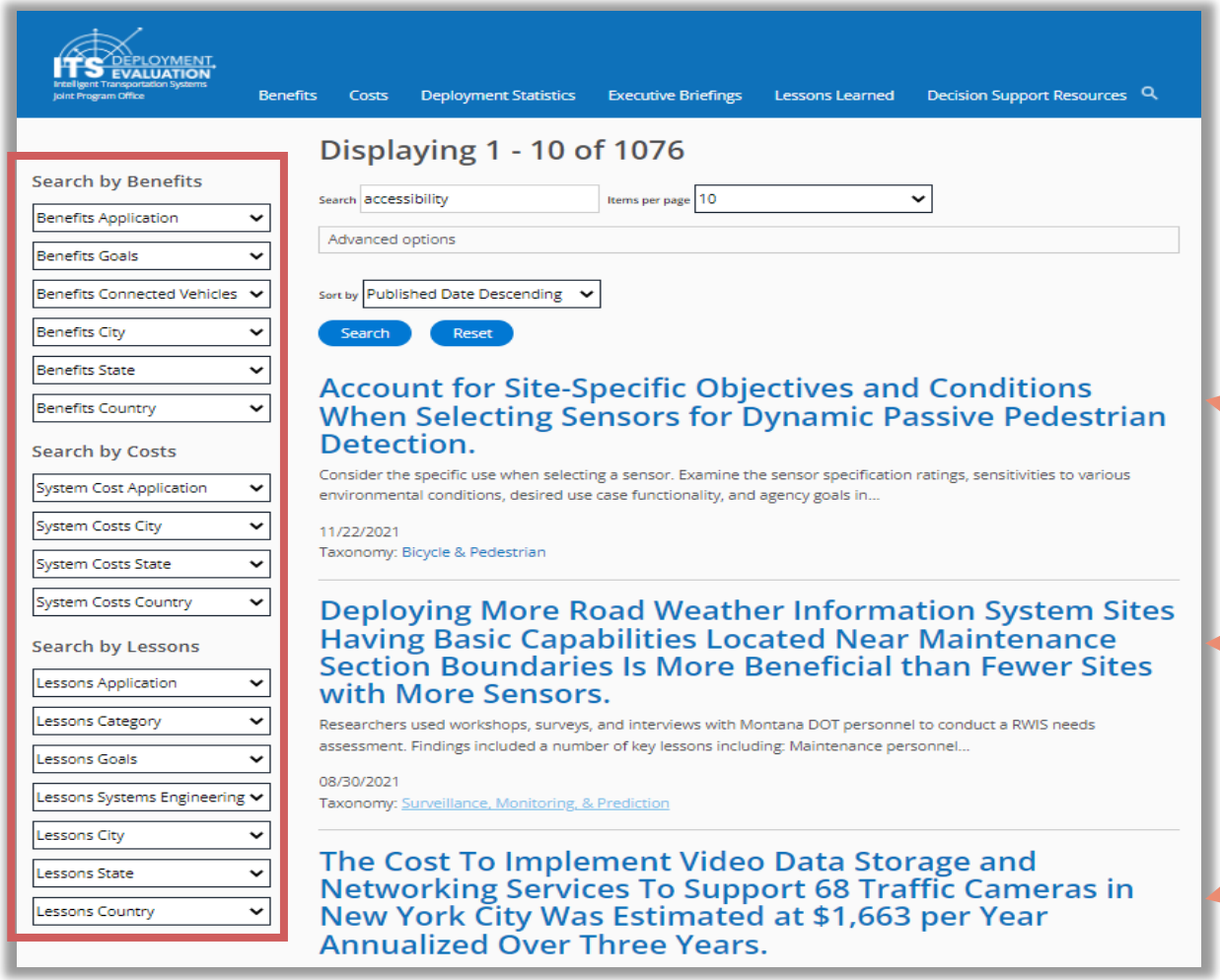


Search all databases by entering your search term

www.itskrs.its.dot.gov

SEARCH RESULTS FOR "ACCESSIBILITY"

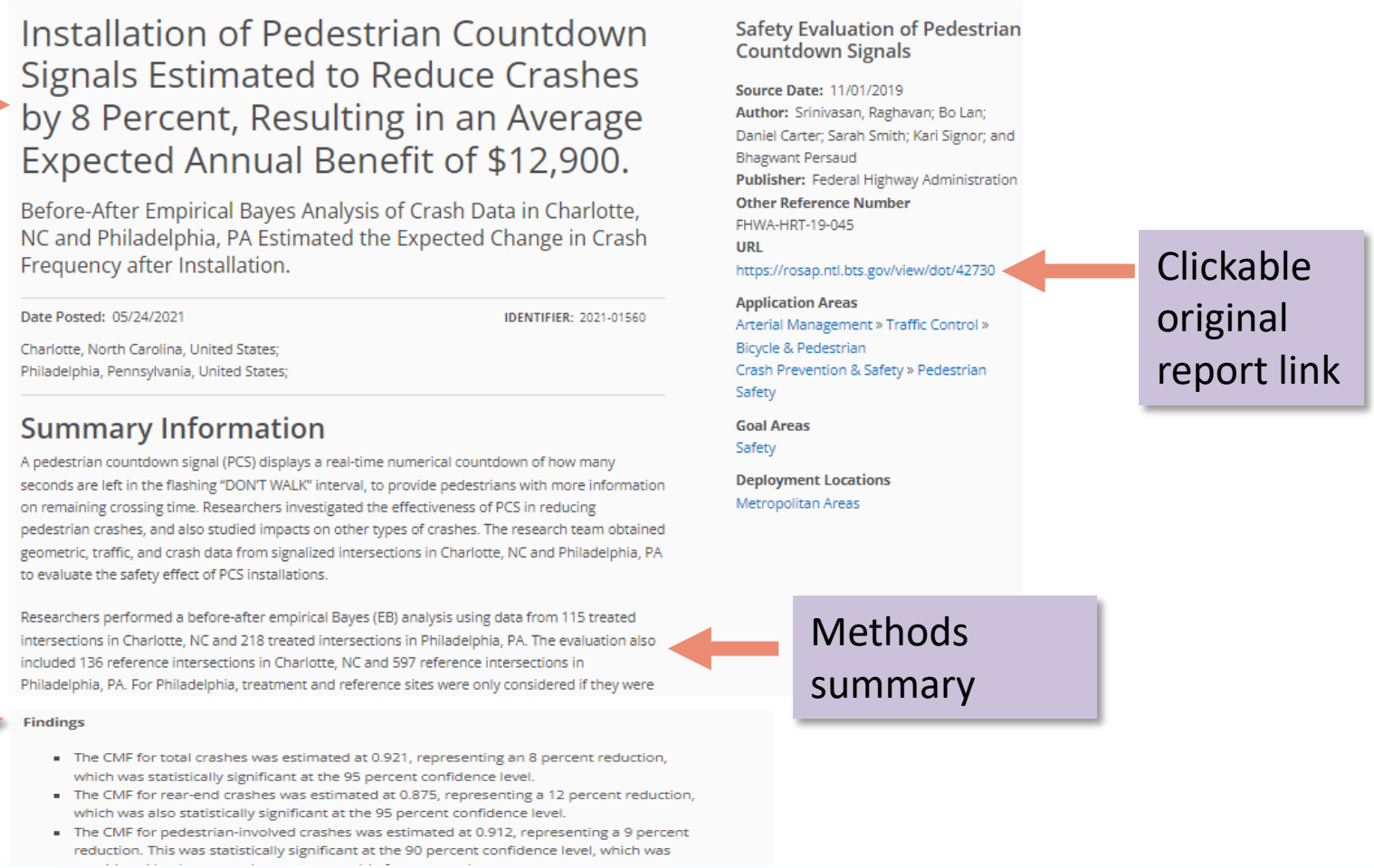
Filters enable more robust search



Most recent benefits, costs, and lessons learned shown first

BENEFIT EXAMPLE

Headline with location and date information



Installation of Pedestrian Countdown Signals Estimated to Reduce Crashes by 8 Percent, Resulting in an Average Expected Annual Benefit of $12,900.

Before-After Empirical Bayes Analysis of Crash Data in Charlotte, NC and Philadelphia, PA Estimated the Expected Change in Crash Frequency after Installation.

Date Posted: 05/24/2021 **IDENTIFIER:** 2021-01560

Charlotte, North Carolina, United States;
Philadelphia, Pennsylvania, United States;

Summary Information

A pedestrian countdown signal (PCS) displays a real-time numerical countdown of how many seconds are left in the flashing "DON'T WALK" interval, to provide pedestrians with more information on remaining crossing time. Researchers investigated the effectiveness of PCS in reducing pedestrian crashes, and also studied impacts on other types of crashes. The research team obtained geometric, traffic, and crash data from signalized intersections in Charlotte, NC and Philadelphia, PA to evaluate the safety effect of PCS installations.

Researchers performed a before-after empirical Bayes (EB) analysis using data from 115 treated intersections in Charlotte, NC and 218 treated intersections in Philadelphia, PA. The evaluation also included 136 reference intersections in Charlotte, NC and 597 reference intersections in Philadelphia, PA. For Philadelphia, treatment and reference sites were only considered if they were

Findings

- The CMF for total crashes was estimated at 0.921, representing an 8 percent reduction, which was statistically significant at the 95 percent confidence level.
- The CMF for rear-end crashes was estimated at 0.875, representing a 12 percent reduction, which was also statistically significant at the 95 percent confidence level.
- The CMF for pedestrian-involved crashes was estimated at 0.912, representing a 9 percent reduction. This was statistically significant at the 90 percent confidence level, which was

Safety Evaluation of Pedestrian Countdown Signals

Source Date: 11/01/2019
Author: Srinivasan, Raghavan; Bo Lan; Daniel Carter; Sarah Smith; Kari Signor; and Bhagwant Persaud
Publisher: Federal Highway Administration
Other Reference Number
FHWA-HRT-19-045
URL
https://rosap.ntl.bts.gov/view/dot/42730

Application Areas
Arterial Management » Traffic Control »
Bicycle & Pedestrian
Crash Prevention & Safety » Pedestrian Safety

Goal Areas
Safety

Deployment Locations
Metropolitan Areas

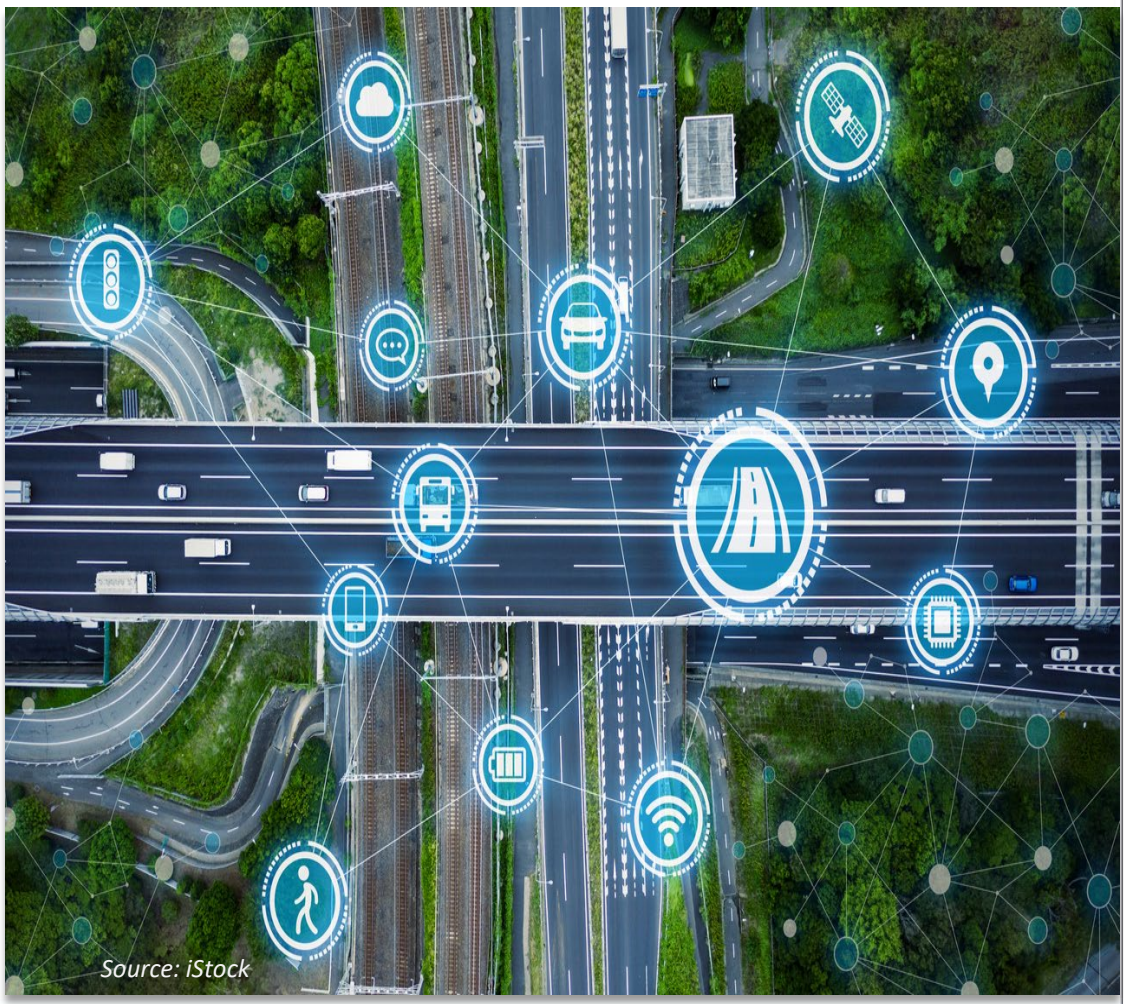
Clickable original report link

Methods summary

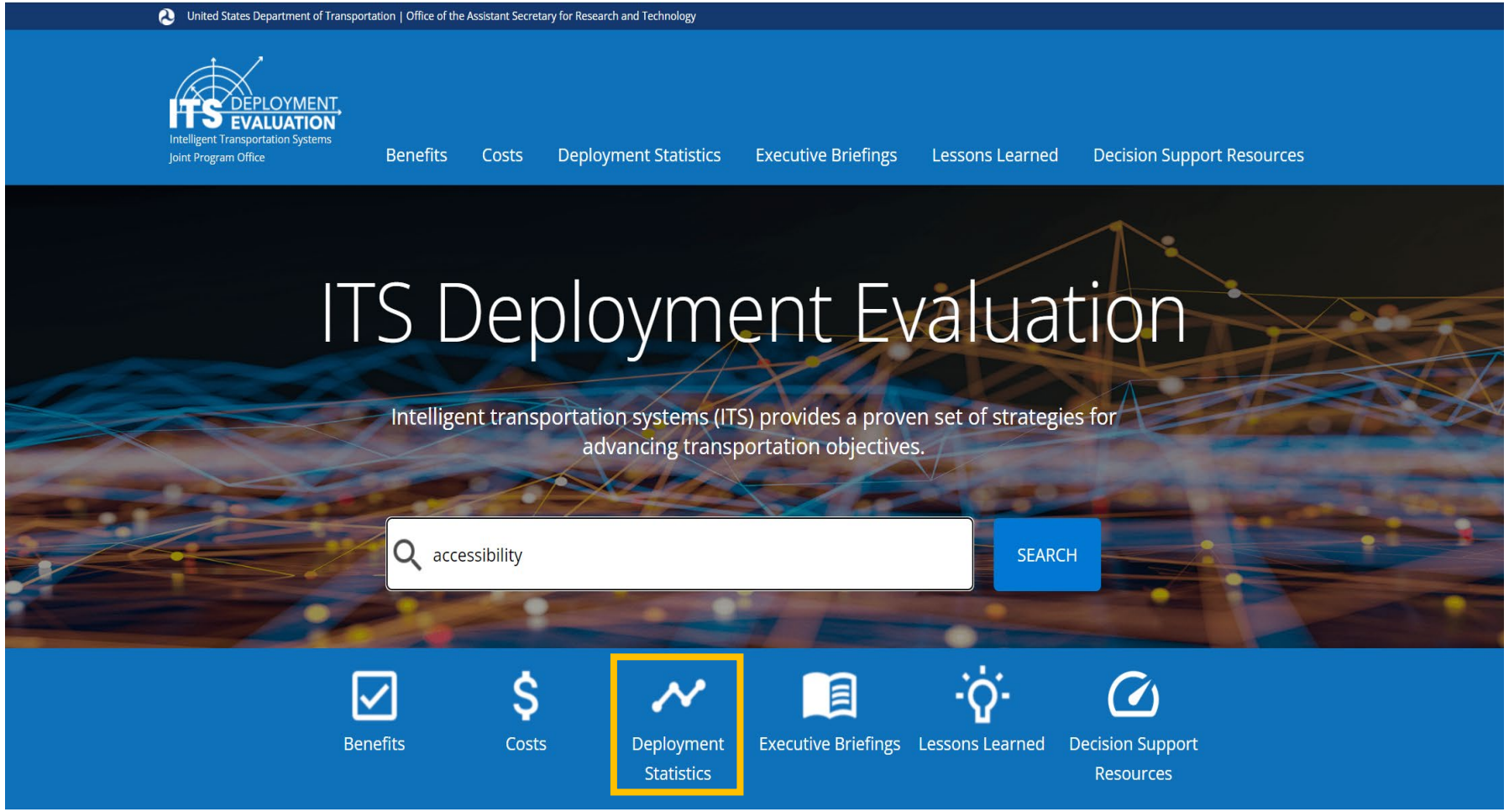
Findings with benefits summary

ITS DEPLOYMENT TRACKING SURVEY (DTS) DATA

- Survey tracks public sector ITS deployment, agencies' plans for future ITS, and needs for knowledge transfer
- Survey has been administered since 1997
  - Survey administered to freeway, arterial, and transit agencies within 108 large and medium sized metropolitan areas
- 20+ years of ITS deployment data



ACCESSING ITS DEPLOYMENT TRACKING SURVEY DATA



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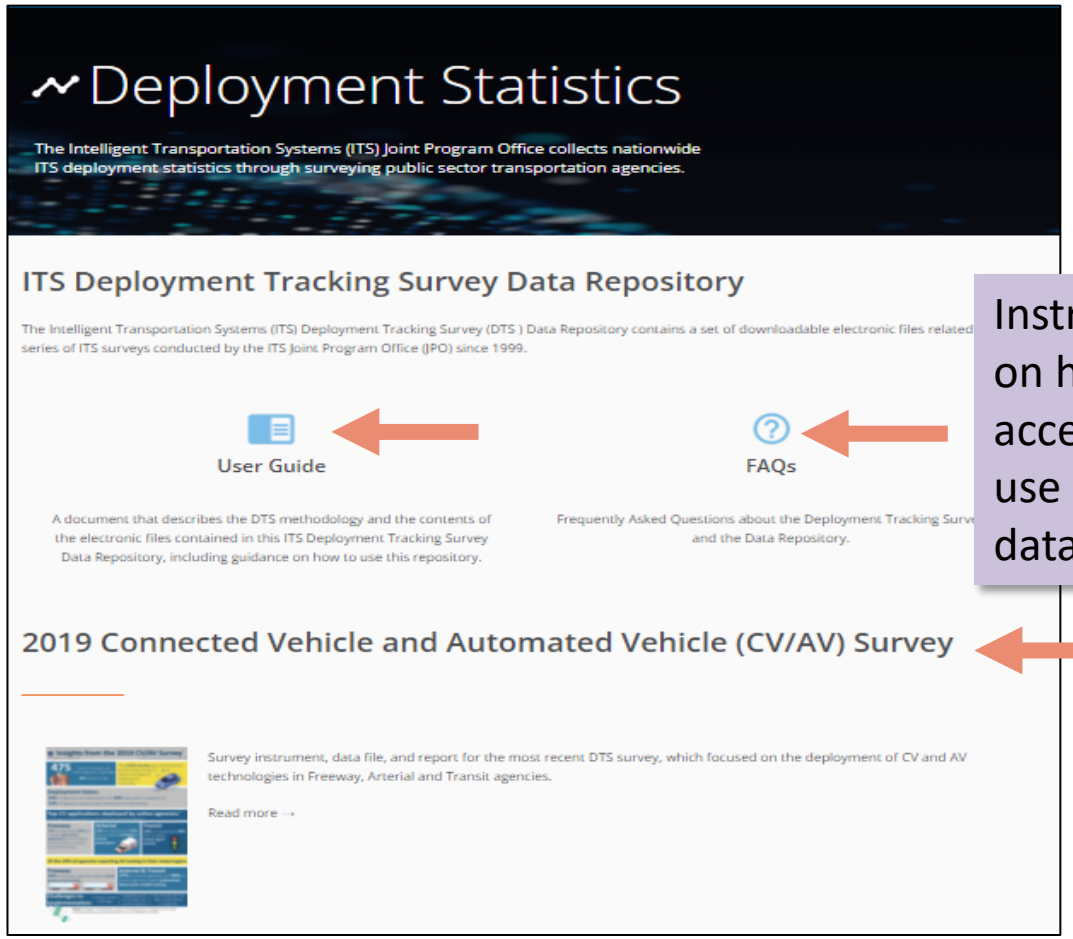
DEPLOYMENT STATISTICS LANDING PAGE



Instructions on how to access and use the raw data

Most recent survey – the 2020 DTS will be posted soon

And if you scroll down a bit further…

DEPLOYMENT STATISTICS LANDING PAGE

Past Surveys, Data, and Reports

Special Topic Surveys such as Rural Transit Survey

ITS Deployment Tracking Surveys – 1999 to 2016

The ITS Deployment Tracking Surveys (DTS) were conducted a total of ten times between 1999 and 2016. Data is collected from Freeway, Arterial, and Transit agencies in 78 large and 30 medium-sized metropolitan areas. The DTS were designed to collect data characterizing ITS technology deployment, as well as programs and policies implemented to support ITS. The website includes the following DTS files:

SURVEY INSTRUMENTS
Arterial, Freeway, and Transit Management survey instruments used to collect deployment data each year a survey was conducted.

DEPLOYMENT DATA
Data files associated with the Arterial, Freeway, and Transit surveys. Each data file contains three worksheets: Data, Data dictionary, and Variable Summary Statistics.

FINAL REPORTS
The complete set of downloadable Final Reports associated with each Intelligent Transportation Systems (ITS) Deployment Tracking Survey (DTS) conducted.

COMMON SURVEY QUESTIONS
Three files (one for each survey type – Freeway, Arterial and Transit) that group common questions across the surveys conducted.

Special Topic Deployment Surveys

In addition to the Deployment Tracking Surveys administered to freeway, arterial and transit agencies, the ITS JPO has conducted a number of special topic surveys, including the following:

2019 Small Urban and Rural Transit Survey

Electronic Toll Collection (ETC) Surveys

Incident Management/Public Safety Surveys

Metropolitan Planning Organization (MPO) Surveys

Statewide ITS Systems Surveys

Traffic Management Center (TMC) Surveys

ITS Deployment Evaluation Program

Marcia Pincus
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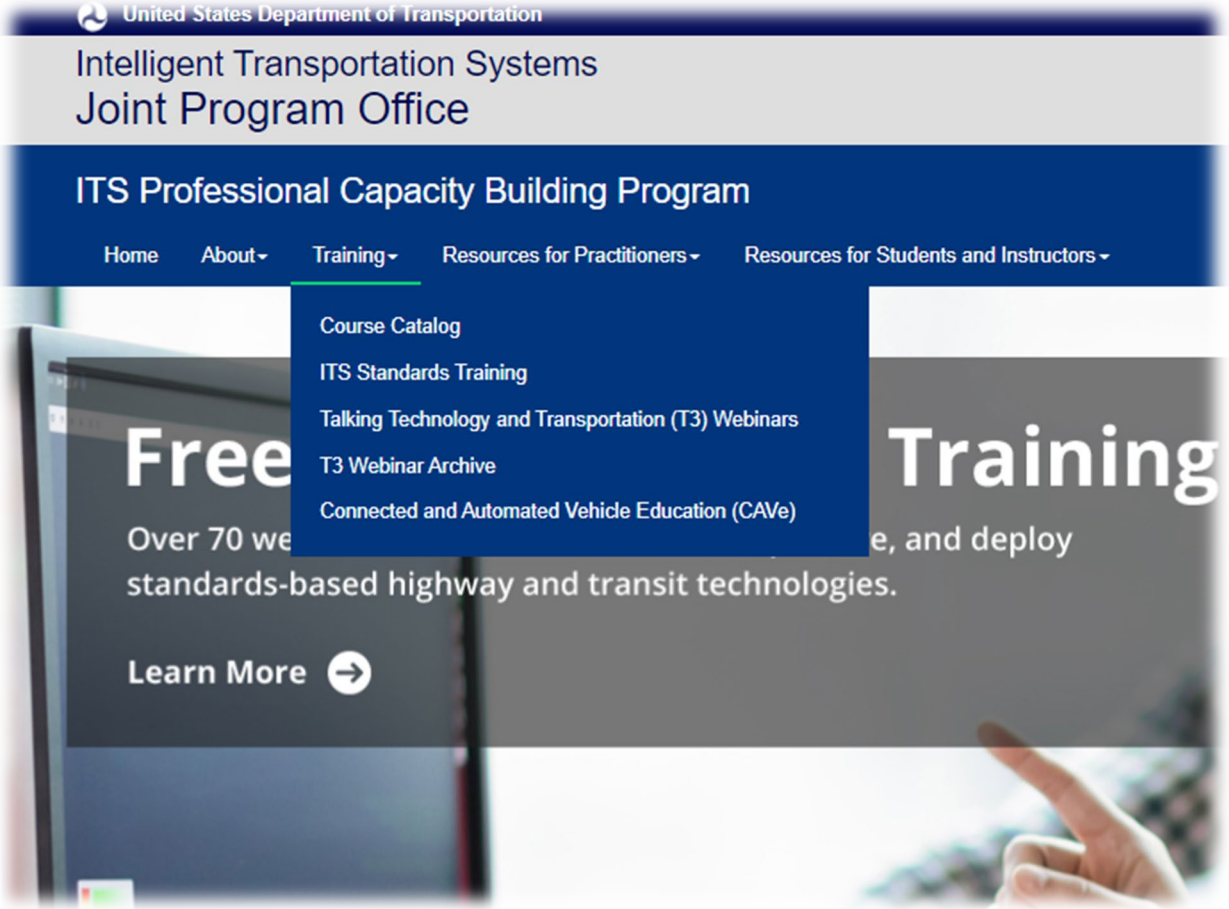
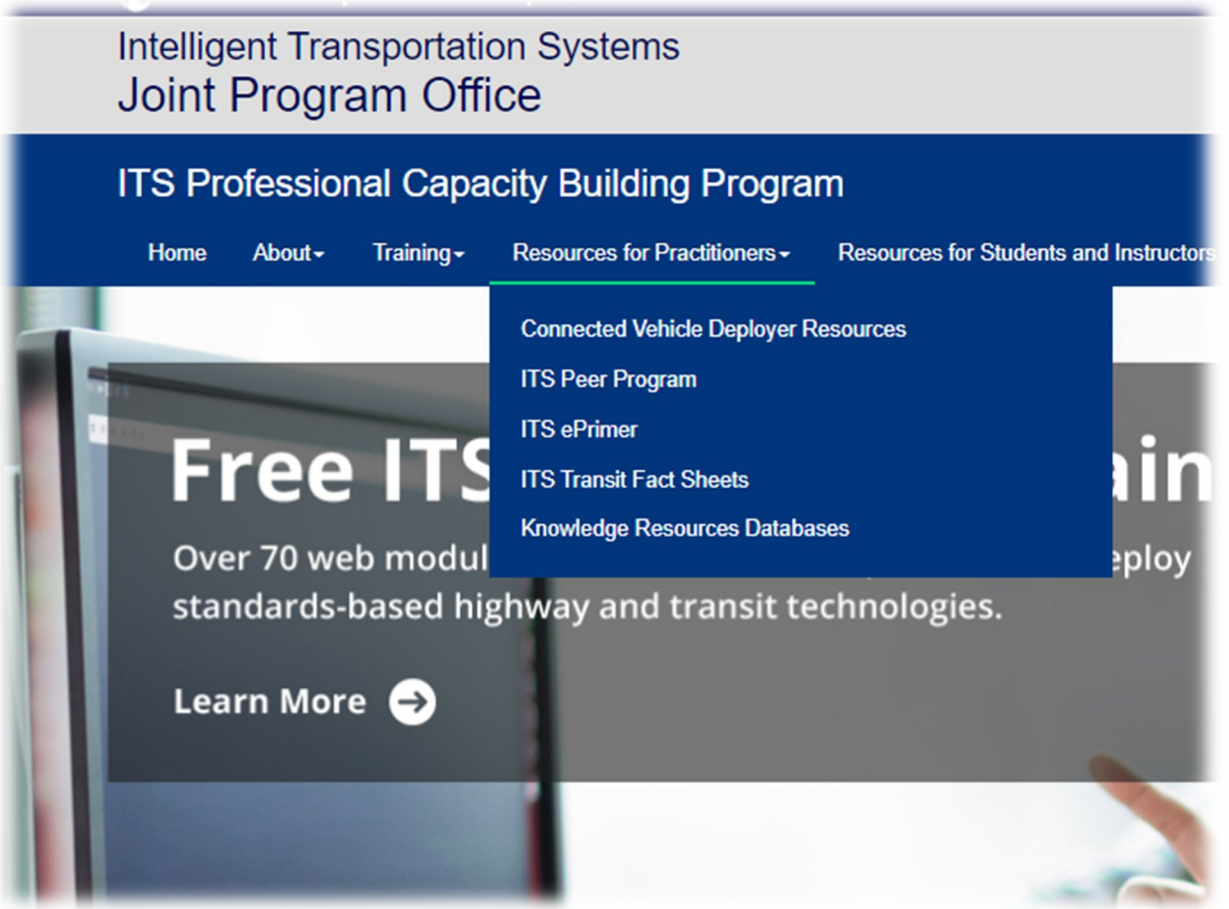
Visit the ITS Deployment Evaluation Website:

www.itskrs.its.dot.gov

ITS Professional Capacity Building Homepage

ITS Professional Capacity Building Homepage





https://www.pcb.its.dot.gov/pcb_role.aspx

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ITS Professional Capacity Building Program

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Home | About | Training | Resources for Practitioners | Resources for Students and Instructors

About the ITS Professional Capacity Building Program

PCB's Role

The ITS PCB Program works with the managers of the ITS Program's research programs to devise, coordinate, and implement outreach and technology transfer activities. These activities keep transportation stakeholders informed about the progress in research and advances in ITS technologies and how they can be applied to solve real-world transportation challenges.

The ITS PCB Program has worked successfully to bring emerging results from the ITS Test Beds, the Integrated Corridor Management, and Active Transportation Demand Management research programs to the wider transportation community through partnerships to deliver training at ITS America state chapter meetings and the T3 webinar program.

The USDOT is currently engaged in an ambitious technology transfer effort to move the results of its connected vehicle research program into implementation by private industry and public transportation agencies. The ITS PCB Program is assisting in this effort by highlighting demonstrations of connected vehicle concepts and technologies, developing T3 webinars on lessons learned from the ITS Test beds and model deployment, and collecting audience needs for future connected vehicle training.

For more information about the ITS PCB Program, read the program's Fact Sheet. [HMTL]

For more information, contact:

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Michelle Noch
ITS Professional Capacity Building Program Manager

SUPPORT

Technical Assistance is available to Federal, State and local transportation agencies through:

ITS Peer Program - The ITS Peer-to-Peer Program puts you in touch with technical experts or experienced peers.
ITS Help Line - The ITS Help Line provides technical support by email or telephone at 866-367-7487.

STAY CONNECTED

ITS PCB Program Stakeholders

The ITS PCB Program works in partnership with professional associations, universities, and the training programs of U.S. DOT modal administrations to engage the broad technical and organizational expertise needed to develop and deliver ITS learning.

The ITS PCB Program has established partnerships with several organizations:

- American Association of State Highway and Transportation Officials
- American Public Transportation Association
- Association of Metropolitan Planning Organizations
- Institute of Transportation Engineers
- Intelligent Transportation Society of America
- National Association of Development Organizations
- National Association of Regional Councils
- National Operations Center of Excellence
- National Highway Institute
- National Transit Institute

- **Classroom/Courses** – National Highway Institute live and online courses; courses developed by other partners and third parties
- **Online Training Modules** – ITS standards, ITS transit standards, ITS ePrimer
- **Guidance and Educational Materials** – ITS ePrimer modules, transit technology fact sheets, ITS Knowledge Resources Database

To learn more about this program, visit: www.pcb.its.dot.gov/

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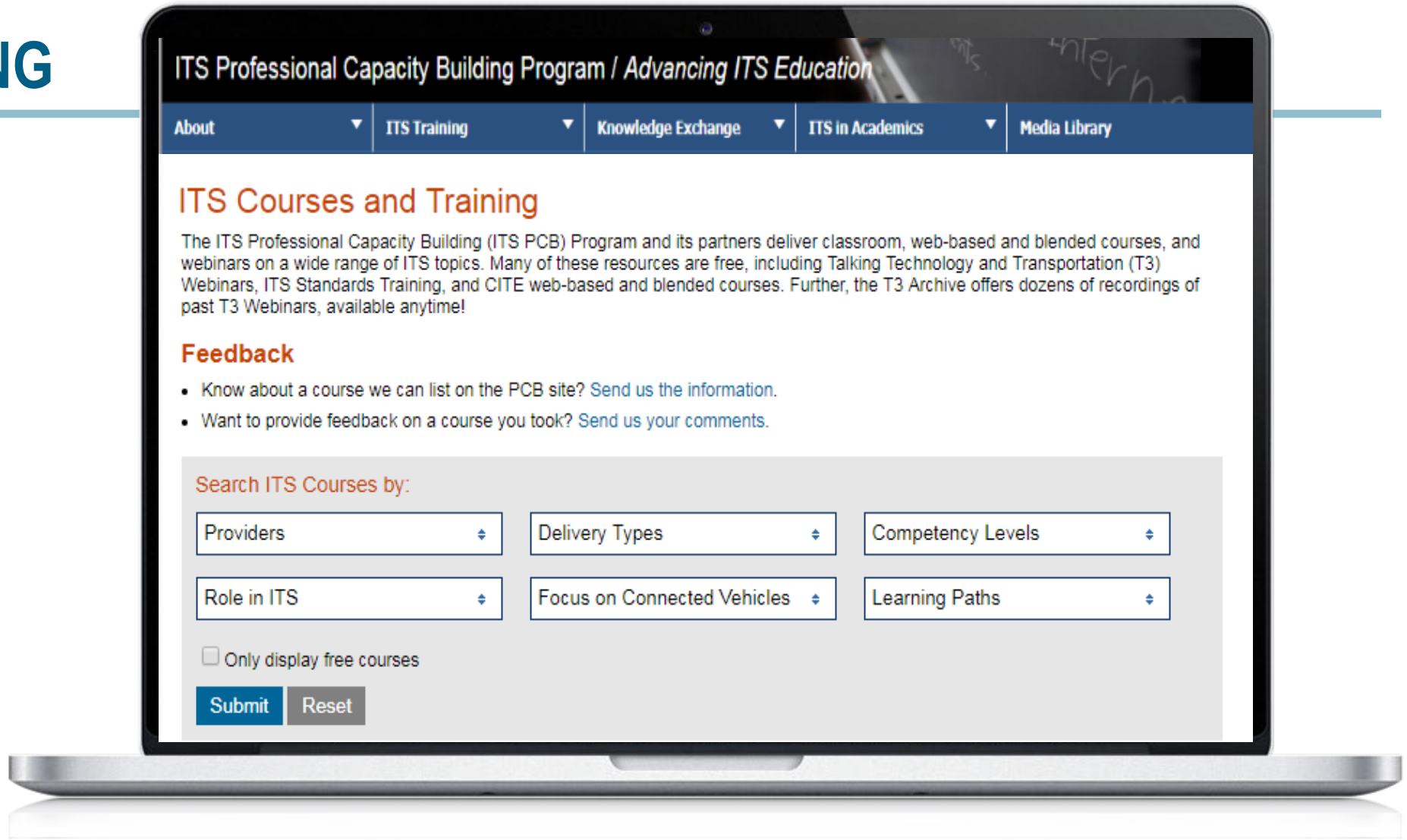
ONLINE TRAINING



Course Catalog

The ITS Professional Capacity Building Program and its partners deliver classroom, web-based and blended courses, and webinars on a wide range of ITS topics. Many of these resources are free, including Talking Technology and Transportation (T3) Webinars and ITS Standards Training. Further, the T3 Archive offers dozens of recordings of past T3 Webinars, available anytime!

For more information, contact:

Michelle Noch
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Feedback

- Know about a course we can list on the PCB site? Send us the information.
- Want to provide feedback on a course you took? Send us your comments.

Search ITS Courses by:

Providers | Delivery Types | Competency Levels

Role in ITS | Focus on Connected Vehicles | Learning Paths

☐ **Only display free courses**

Submit | Reset

SUPPORT

Technical Assistance is available to Federal, State and local transportation agencies through:

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ITS Help Line - The ITS Help Line provides technical support by email or telephone at 866-367-7487.

STAY CONNECTED

ITS Training

ITS Standards Training Modules

The ITS Professional Capacity Building Program (ITS PCB) is pleased to offer FREE ITS standards training.

The **61-module training series** is for practitioners in state and local highway agencies and transit agencies who seek the skills needed to procure, test, implement, and operate standards-based ITS systems and devices. Consultants, system designers, integrators, and testers will also find the training informative.

The **25-module transit training series** focuses exclusively on standards used in transit applications. Similar to the 61-modules series, the transit modules give practitioners the skills to help them effectively procure and utilize standards used in transit systems and devices.

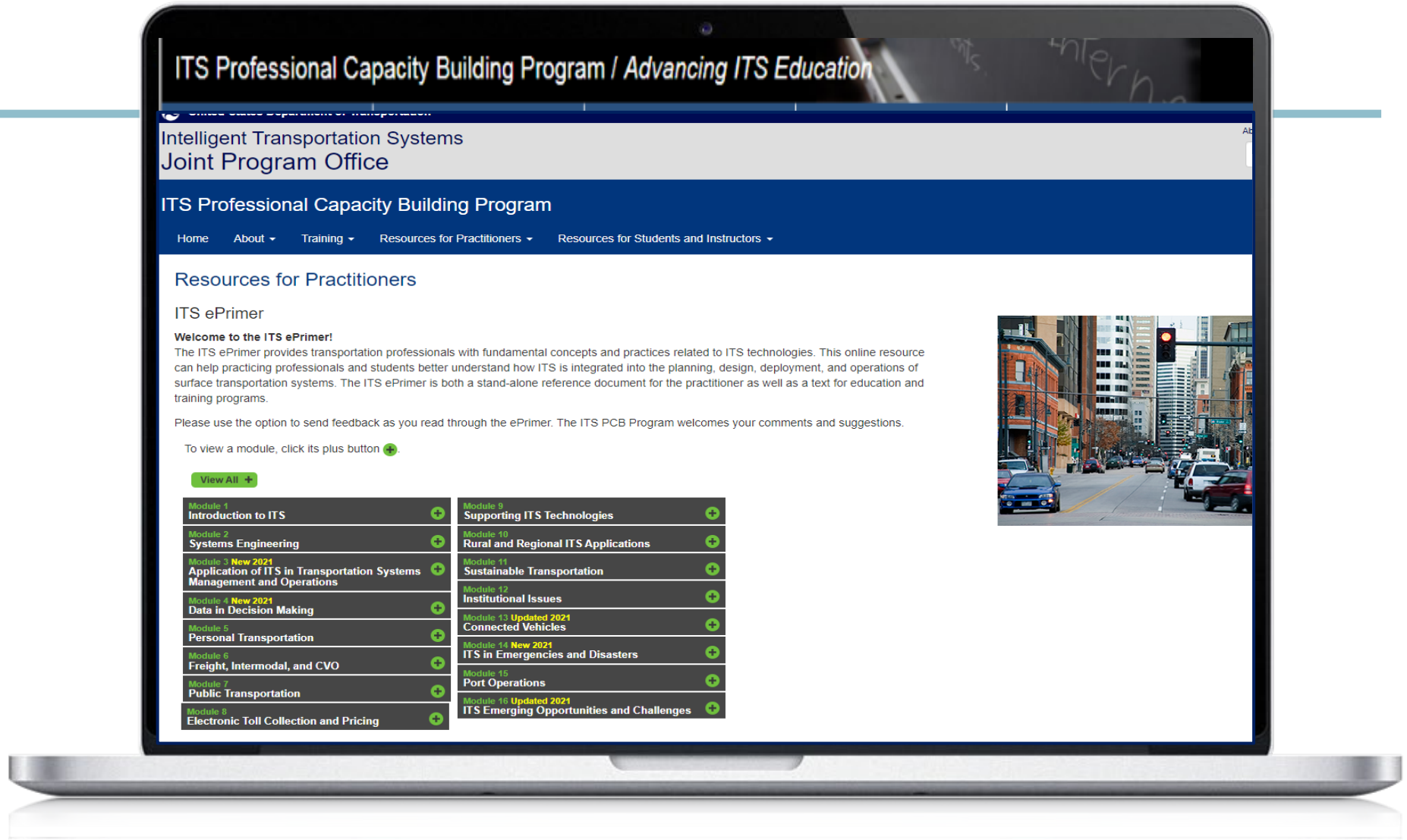
Get started with the 61-module training series →

Get started with the 25-module transit training series →

Why Should You Take ITS Standards Training?

Agencies that use standards in their ITS deployments have a greater capacity to share data and coordinate transportation services across different surface transportation modes. These 90-minute training modules discuss topics and content related to purchasing, testing, implementing, and operating standards-based ITS equipment and systems. Take these modules at your own pace and gain valuable skills that can benefit your career and improve the efficiency of your agency's ITS systems. Read more.

Resources for Practitioners



Intelligent Transportation Systems (ITS)

ePrimer

Module 1 Introduction to ITS — Updated 2021	Module 9 Supporting ITS Technologies — 2014
Module 2 Systems Engineering — 2014	Module 10 Rural and Regional ITS Applications — 2014
Module 3 Application of ITS in TSMO — New 2021	Module 11 Sustainable Transportation — 2014
Module 4 ITS Data in Decision Making — New 2021	Module 12 Institutional Issues — 2014
Module 5 ITS to Support Travelers — *Update 2022*	Module 13 Connected Vehicles — Updated 2021
Module 6 Freight and Commercial Vehicle ITS — *Update 2022*	Module 14 ITS in Emergencies and Disasters — New 2021
Module 7 Public Transportation — Updated 2016	Module 15 Port Operations — New 2019
Module 8 Electronic Toll Collection and Pricing — Updated 2016	Module 16 ITS Emerging Opportunities and — Updated 2021

Guidance and Educational Materials

Resources for Practitioners

ITS Transit Fact Sheets

View All +

- Automatic Passenger Counters
- Automatic Vehicle Location
- Communication Technologies
- Computer Aided Dispatch & Scheduling
- Electronic Fare Payment
- GIS & Data Management
- Maintenance Management Systems
- Security Cameras / Security Systems
- Transit Signal Priority
- Traveler Information
- Weather Information System

Technical Assistance

Equipment Loan Program

Provides a connected and automated vehicle user with the opportunity to become familiar with the types of equipment typically used in connected vehicle deployment.

Help Desk

Provides technical assistance during connected vehicle and automated vehicle testing and deployments

INTELLIGENT TRANSPORTATION SYSTEMS
PCB PEER EXCHANGE PROGRAM

ITS Professional Capacity Building

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Visit the ITS Professional Capacity Building Program Website:

https://www.pcb.its.dot.gov/

WRAP UP?