DDIAPT Deliverables: Overall Review and Impact on Strategic Goals

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Acronyms

- Applied Research Associates (ARA)
- Balanced Mix Design (BMD)
- Development and Deployment of Innovative Asphalt Pavement Technologies (DDIAPT)
- Federal Highway Administration (FHWA)
- Ground Tire Rubber (GTR)
- Paragon Technical Services (PTSi)
- Reclaimed Asphalt Pavement (RAP)
- Reclaimed Asphalt Shingles (RAS)
- Statement of Work (SOW)
- University of Nevada Reno (UNR)
- U.S. Department of Transportation (USDOT)

Intended Outcomes

U.S. Department of Transportation
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- Recognizing the various products from the FHWA-UNR DDIAPT cooperative agreement
- Understanding the link between the DDIAPT products and USDOT/FHWA strategic plans
- Recognizing the impact of DDIAPT products on key performance indicators, strategic objectives and strategic goals
- Recognizing the number of agencies, individuals, and other stakeholders accessing benefitting from the DDIAPT products
- Knowing where to find:
  - Publications, recorded Webinars, and videos

Webinar Outline

U.S. Department of Transportation
Federal Highway Administration

- Introduction & Background
- Strategic Plans
- Summary of Products & Impacts
- Products by Innovation Area
- Where to Find Products
- Wrap Up

Introduction

U.S. Department of Transportation
Federal Highway Administration

- DDIAPT Cooperative Agreement Established Fall 2017 (5 years)
- Team
  - FHWA
  - UNR
  - PTSi
  - ARA
- Agreement Structure
  - Six Innovation Areas (A – F)
  - Tasks Under Innovation Areas – SOW's Annually/Review/Approval/Do Work
  - Activities & Generate Deliverables
  - Provide Access & Communicate

SCAN ME
FHWA CO-OP SITE

SCAN ME
UNR-FHWA CO-OP SITE

Introduction

U.S. Department of Transportation
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- Each Task/Subtask Development to Deliverables
  - SOW Developed/Reviewed by FHWA SMEs/Team Members/Revised/Approved
  - DDAIPT Coop Team Members Partnered to Develop/Deliver Products
  - Each Product (TechBrief, Report, Presentation, Video, Workshop Materials, …) Reviewed by FHWA SMEs/Revised/Approved
  - Deliverables are Accessible/508 Compliant

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Innovation Areas

U.S. Department of Transportation
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A. Materials

B. Resource Responsible (RR) use of Materials for Flexible Pavement Systems

C. Design, Specifications, and Practices (DS&P)

D. Pavement Preservation (PP) Specifications and Practices

E. Real-Time Pavement Production and Construction Controls

F. Forensic Support and Asphalt Testing to Support Stakeholders

- ***6 Innovation Areas (A through F)***
- ***15 Work Plan Task Areas Total***
- ***1 to 8 Subtask Areas Work Plan Tasks in Innovation Areas***

Work Plan Tasks & Titles

U.S. Department of Transportation
Federal Highway Administration

Innovation Area	Work Plan Task/Sub	Title
A. Materials	A.1	Advancement of Innovative Binders for Asphalt Pavement Systems
	A.2	Other New & Innovative Materials as Agreed Upon
B. Resource Responsible (RR) use of Materials for Flexible Pavement Systems	B.1	High Reclaimed Asphalt Pavement (RAP) Mixtures ← Task
	B.1.1	Document Field Performance and RAP Best Practices ← *Subtask*
	B.1.2	Document Field Performance and Cold Asphalt Recycling Best Practices
	B.2	Reclaimed Asphalt Shingles (RAS) Modified Binders and Mixtures
	B.3	Asphalt Rubber-Modified Binders
	B.3.1	Resource Responsible Use of Recycled Tire Rubber in Asphalt Pavements
	B.3.2	Effective use of GTR modified asphalt binder in asphalt mixtures
	B.4	Other New & Innovative RR Systems
	B.4.1	Responsible use of Re-refined Engine Oil Bottoms (REOB) and Polyphosphoric Acid (PPA)
	B.4.2	Recycled Materials and Warm-Mix Asphalt Usage (2020)
	B.4.3	Recycled Materials and Warm-Mix Asphalt Usage (2021)
	B.4.4	Recycled Materials and Warm-Mix Asphalt Usage (2022)

Work Plan Tasks & Titles

U.S. Department of Transportation
Federal Highway Administration

C. Design, Specifications, and Practices (DS&P)	C.1	Asphalt Mixture Performance Based Design Technical Refinement and Deployment Support
	C.1.1	AMPT and PRS Training
	C.1.2	Barrier Analysis to AMPT and PRS
	C.1.3	Informational Brief on Performance and Index Based Tests
	C.1.4	Document Case Studies and Practices for Implementation of BMD
	C.1.5	Asphalt Performance-Related Specifications (PRS) – A 2020 RoadMap for Moving Forward
	C.1.6	Document Practices for Asphalt Mixture Adjustments to Meet Performance Test Requirements
	C.1.7	Balanced Mix Design (BMD) Case Studies Virtual Workshop: Moving Forward with Implementation
	C.1.8	Balanced Mixture Design Peer Exchange – PART I & II
	C.2	Deployment and Technical Support of Refined Superpave Binder Specification
	C.2.1	Incorporate MSCR, ΔTc, etc. into the Specification
	C.3	Technical Support of Refined Superpave Volumetric Mixture Design & Specification
	C.4	Increased Pavement Density Initiative Support
	C.4.1	Asphalt Density Educational Materials
	C.4.2	Support Delayed Asphalt Density Efforts
	C.4.3	Density Specification Focused Review
	C.5	Deployment and Technical Support of MSCR Binder Specifications
	C.6	Deployment and Technical Support of Delta Tc Binder Parameter and Specifications
	C.7	Asphalt Materials Quality Assurance Practices
	C.8	Other New and Innovative DS&P As Agreed Upon
	C.8.1	Advances in the Design, Production, and Construction of Stone Matrix Asphalt (SMA)
	C.8.2	National Asphalt Plant Quality Control Plan Template
	C.8.3	Asphalt Carbon Footprint Reduction Workshop

Work Plan Tasks & Titles

U.S. Department of Transportation
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D. Pavement Preservation (PP) Specifications and Practices	**D.1**	**New and Innovative PP Specifications and Practices**
	D.1.2	Reduce Cutbacks in Pavement Maintenance and Preservation
E. Real-Time Pavement Production and Construction Controls	E.1	New and Innovative Real-Time Production and Construction Controls
	E.1.1	Review of Paver-Mounted Thermal Profiler and Density Profile System Using Ground Penetrating Radar
	E.1.2	Intelligent Construction Equipment QA Data Validation
F. Forensic Support and Asphalt Testing to Support Stakeholders	F.1	Asphalt Pavement Analysis, Binder and Mixture Testing, and Data Analysis
	F.2	On-Site Field Investigations
		Marketing and Communication Plans

Innovation Area B: Resource Responsible (RR) use of Materials for Flexible Pavement Systems Publications

U.S. Department of Transportation
Federal Highway Administration

Number	Document or Activity	Type	Date	Total Visits	Views			Attendance of Virtual Site Visits
					U.S.	Other Countries	Total	
FHWA-HIF-23-205	Responsible Use of Polyphosphoric Acid (PPA) Modification of Asphalt Binders.	Technical Report	Feb-2023	435	274	117	391	0
FHWA-HIF-22-003	Tech brief: Resource responsible use of reclaimed asphalt pavement in asphalt mixture	Tech Brief	July-2021	1,074	721	274	995	0
WRSC-TR-21-10	Successful use of reclaimed asphalt pavement in asphalt mixtures	Technical Report	July-2021	1,090	728	253	981	0
FHWA-HIF-22-001	Tech brief: Practices and lessons learned when using reclaimed asphalt shingles in asphalt mixtures	Tech Brief	Aug-2021	756	505	208	713	0

Innovation Area B. Resource Responsible (RR) Use of Materials for Flexible Pavement Systems

U.S. Department of Transportation
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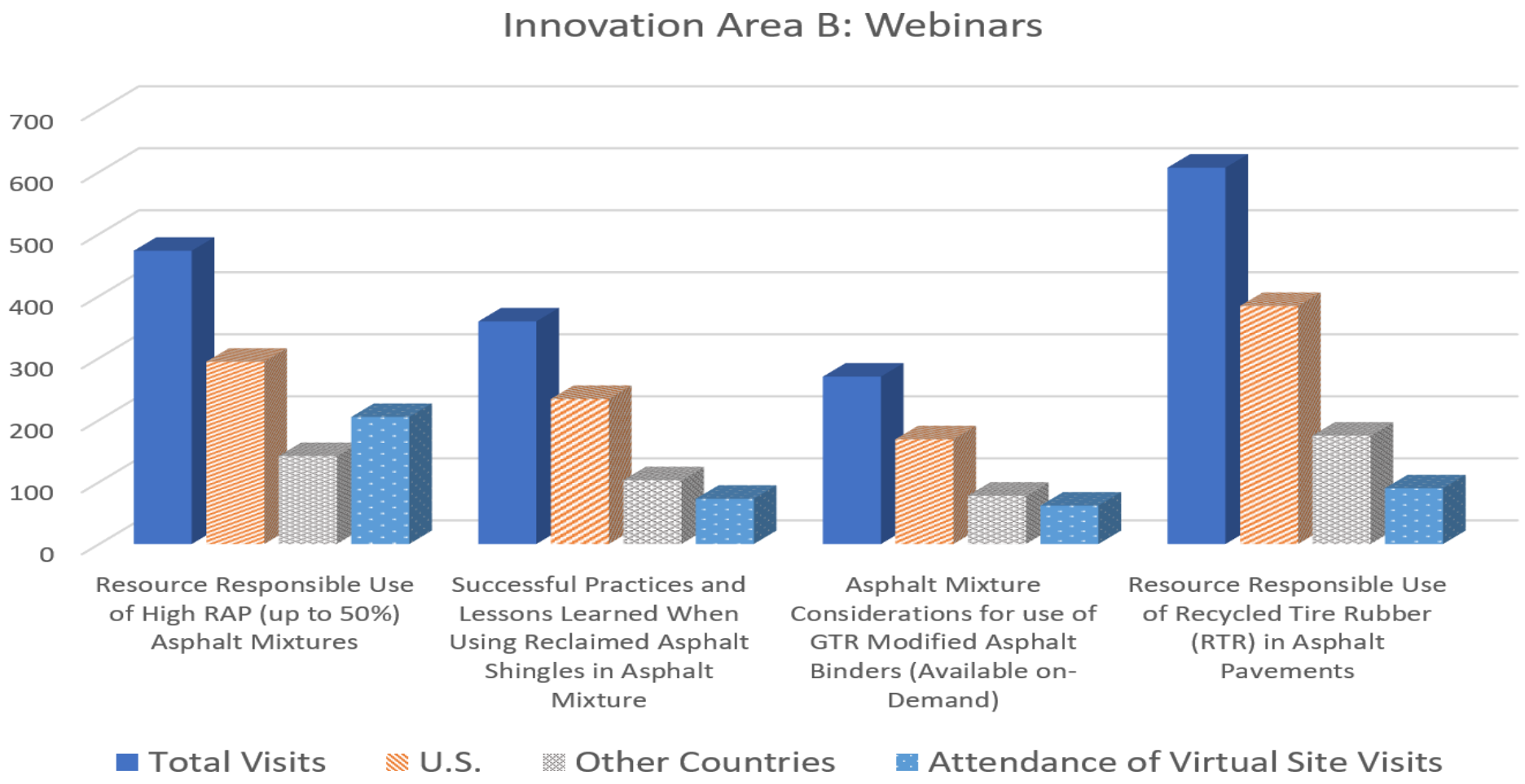
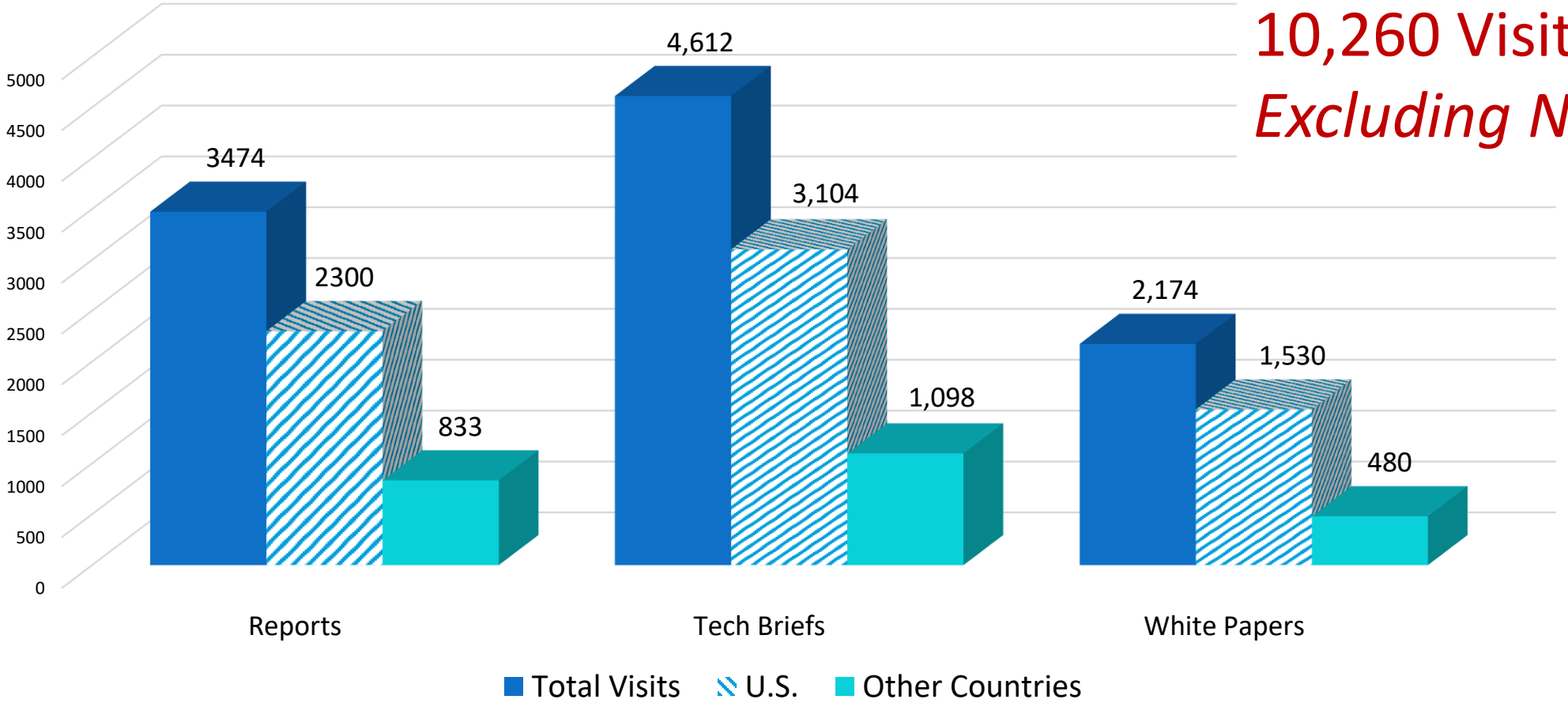


Innovation Area B: Resource Responsible (RR) use of Materials for Flexible Pavement Systems Publications

U.S. Department of Transportation
Federal Highway Administration



10,260 Visits

Excluding NAPA IS-128

Innovation Area C: Design, Specifications, and Practices (DS&P) Publications

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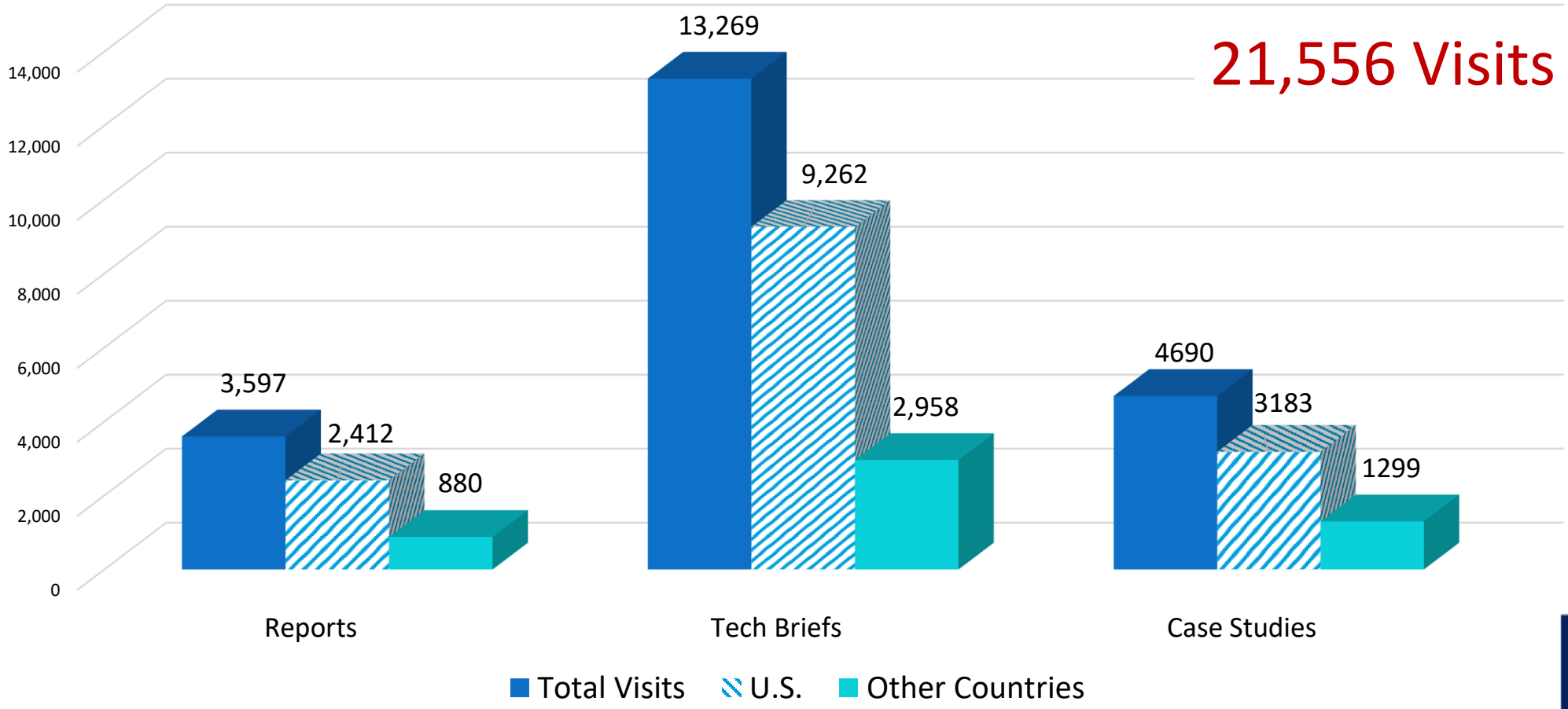

FHWA Balanced Mix Design Case Studies Virtual and In-Person Workshops

U.S. Department of Transportation
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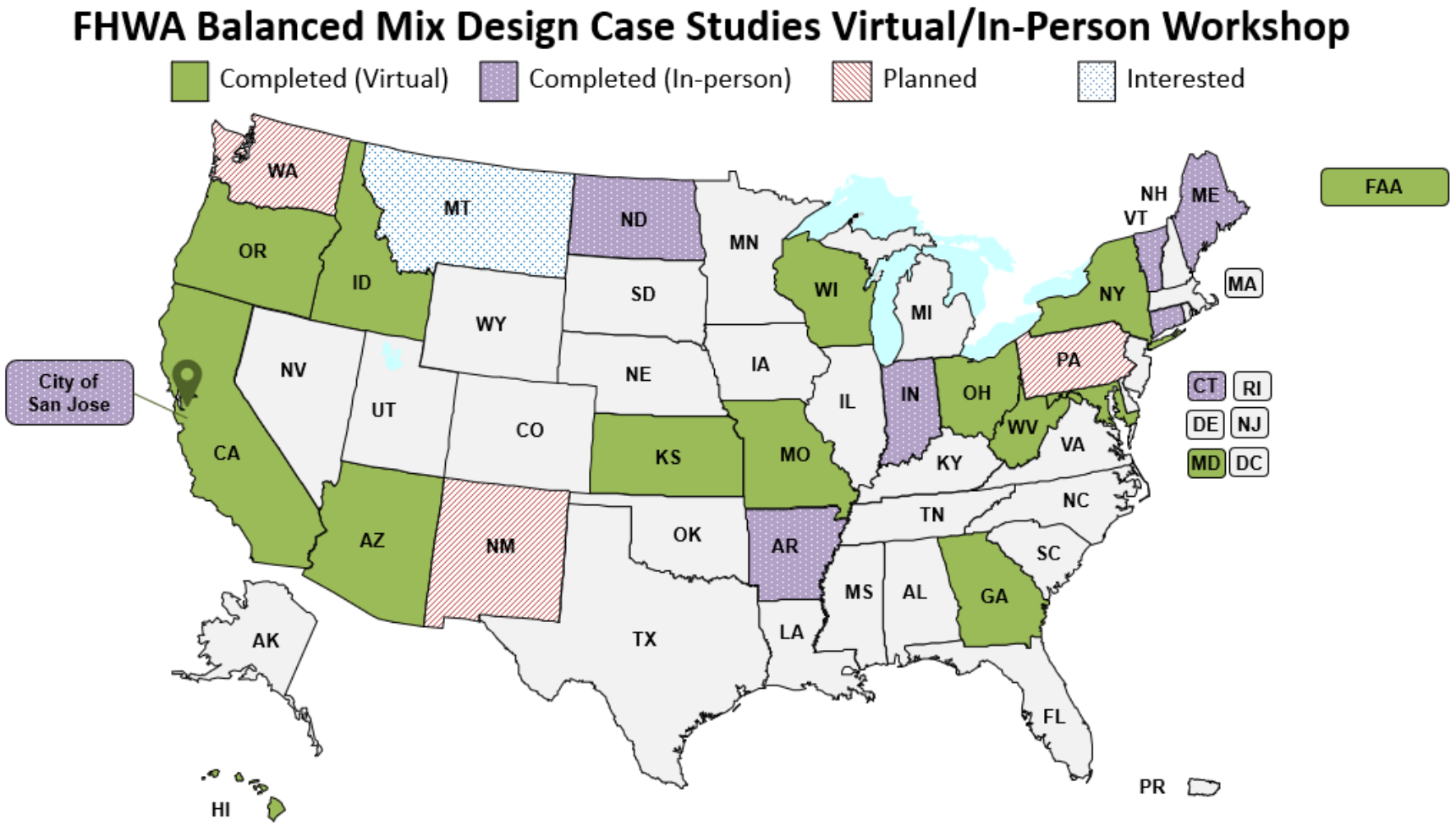
- 14 Virtual
- 7 In-Person
- 3 Planned
- 2 Interested



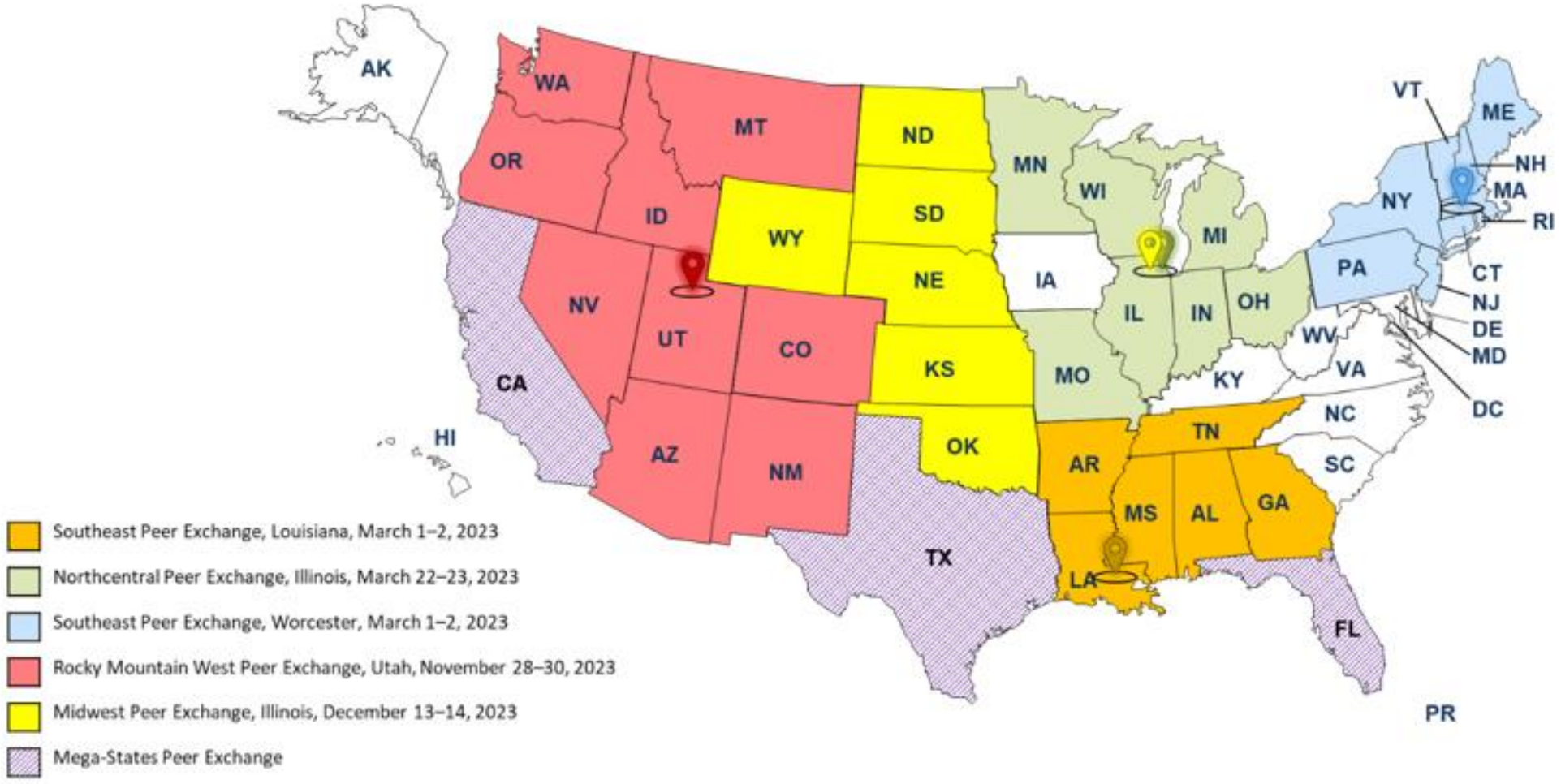
786 participants at
21 workshops

U.S. Department of Transportation
Federal Highway Administration

As of March 4, 2024

FHWA Peer Exchanges

U.S. Department of Transportation
Federal Highway Administration



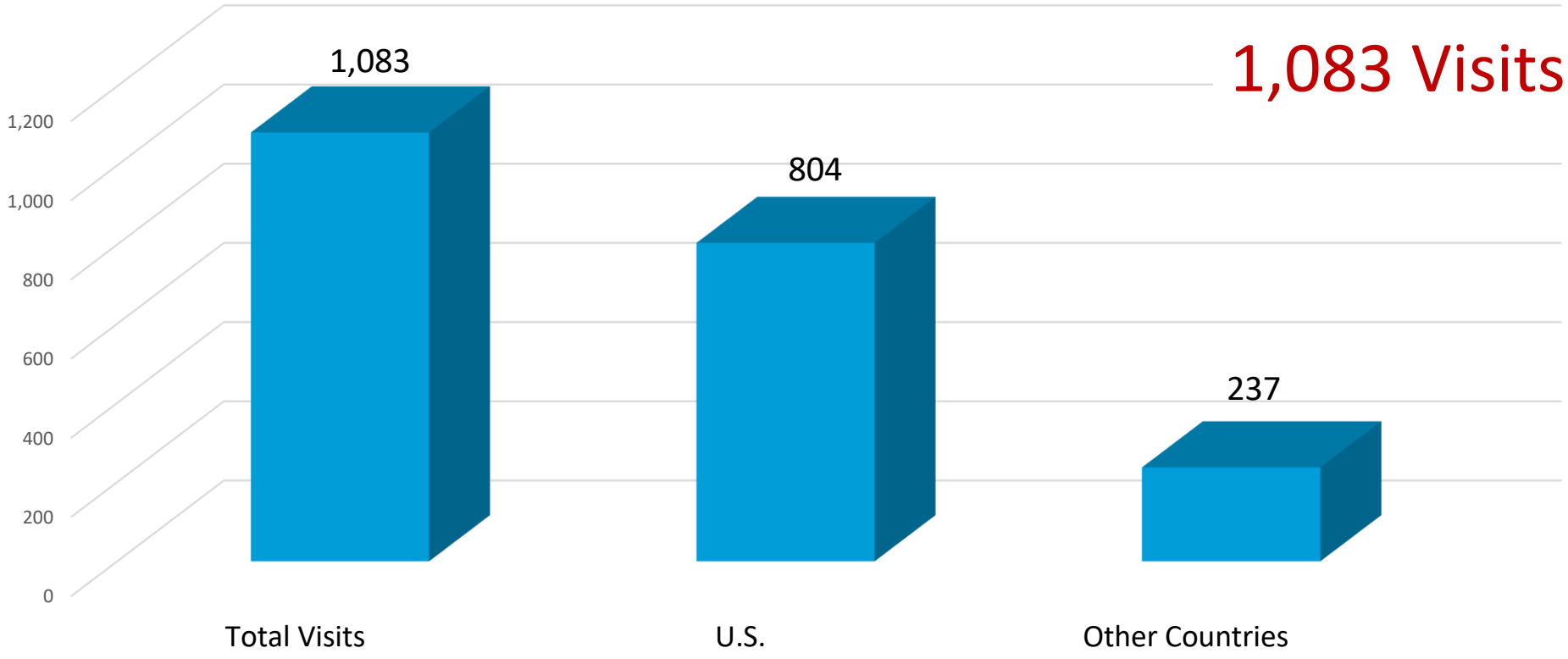
BMD peer exchanges Part I and Part II.

Coming up in Fall 2024
PART III Mid-Atlantic Peer Exchange

Innovation Area D: Pavement Preservation (PP) Specifications and Practices

Publications

U.S. Department of Transportation
Federal Highway Administration

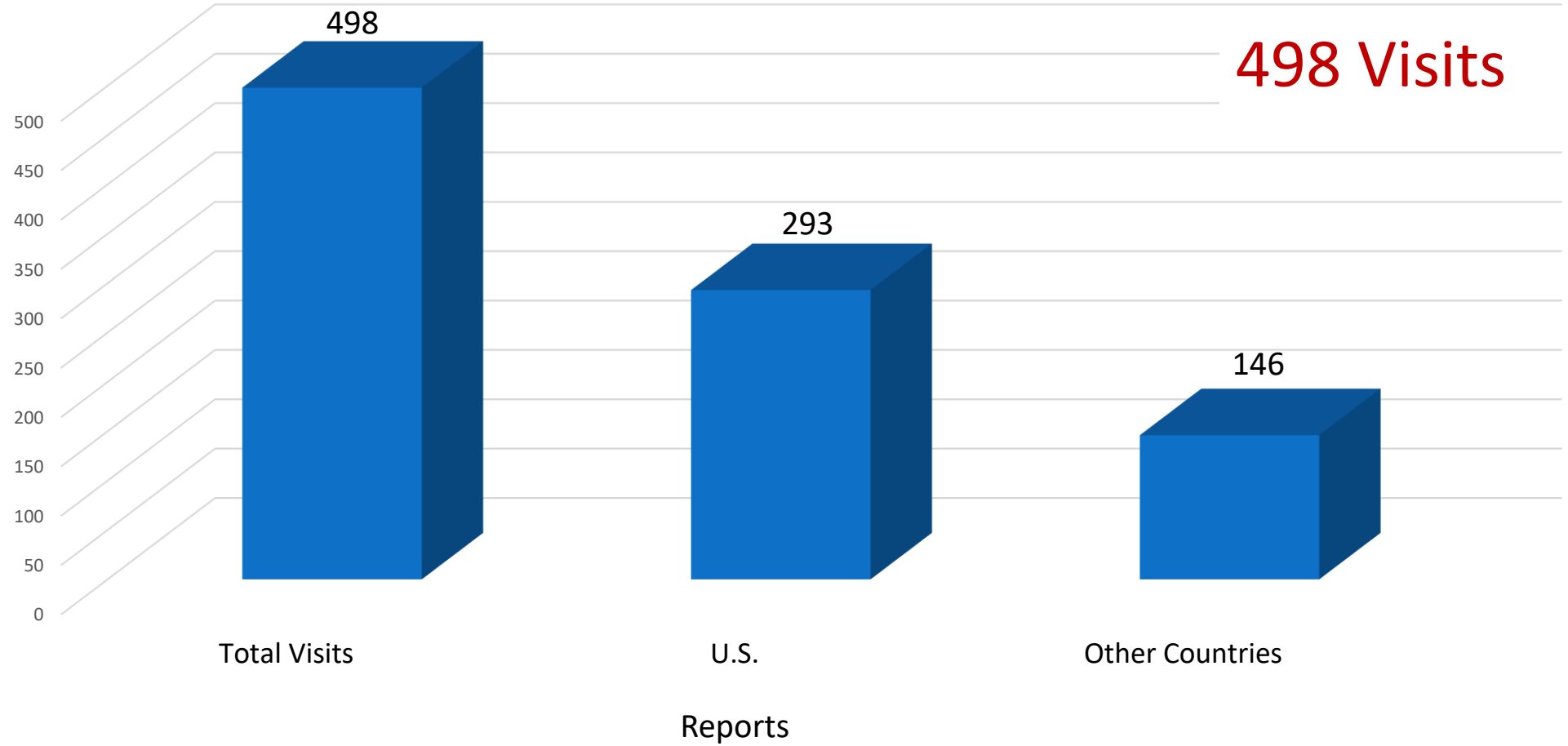


1,083 Visits

Innovation Area E: Real-Time Pavement Production and Construction Controls

Publications

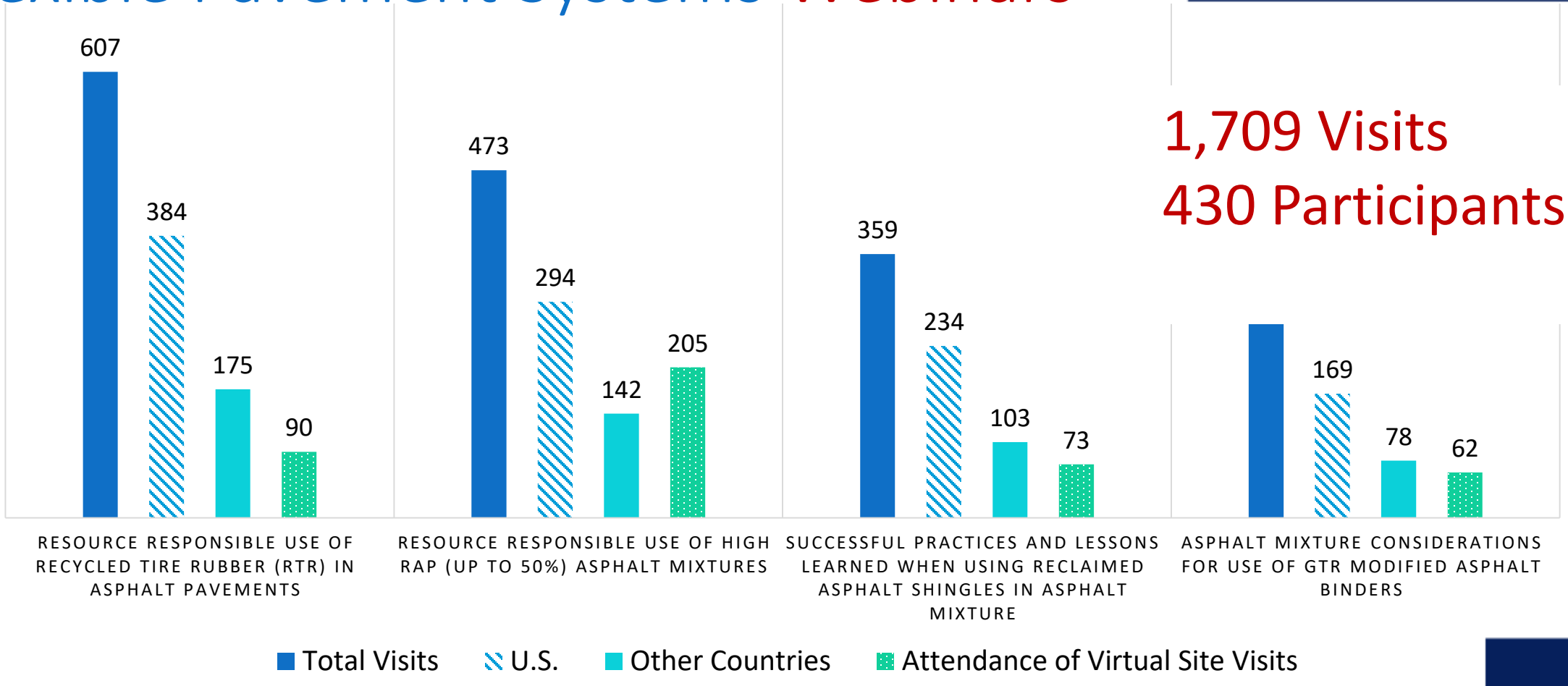
U.S. Department of Transportation
Federal Highway Administration



498 Visits

Innovation Area B: Resource Responsible (RR) use of Materials for Flexible Pavement Systems Webinars

U.S. Department of Transportation
Federal Highway Administration

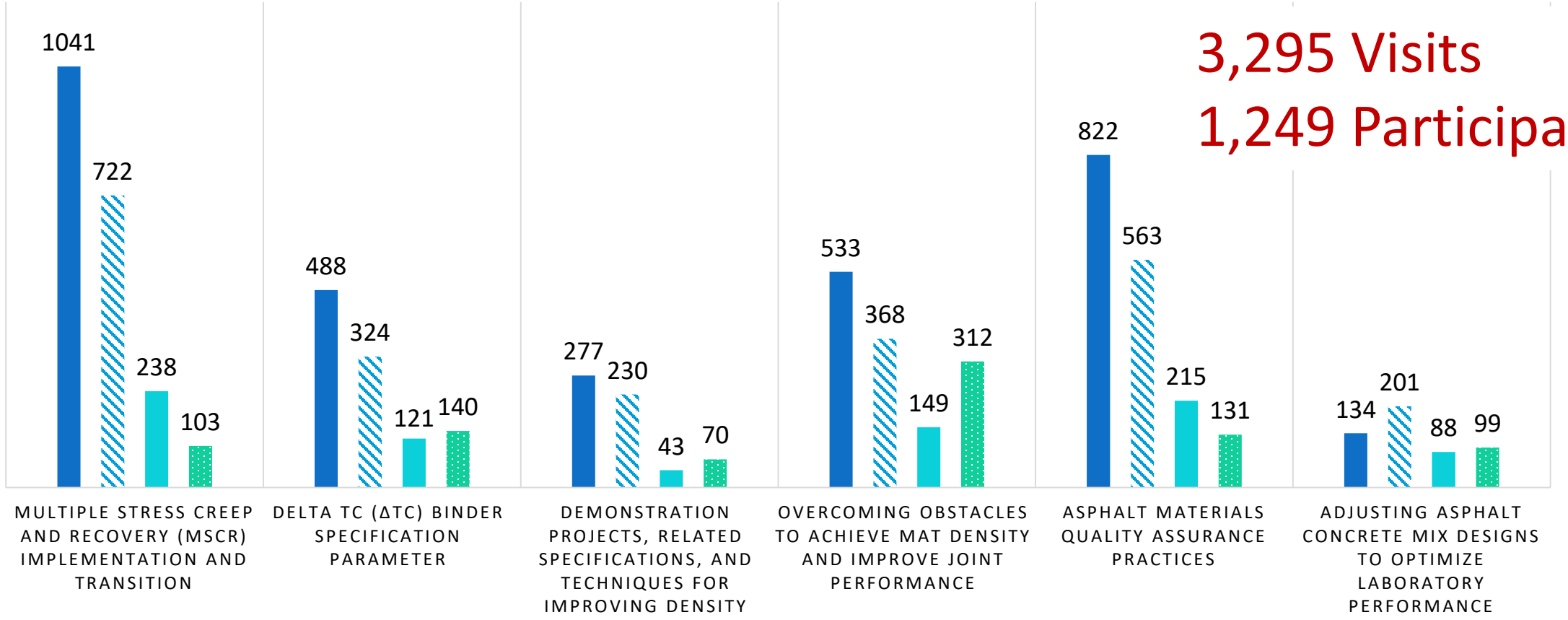


1,709 Visits
430 Participants

Innovation Area C: Design, Specifications, and Practices (DS&P) Webinars

U.S. Department of Transportation
Federal Highway Administration

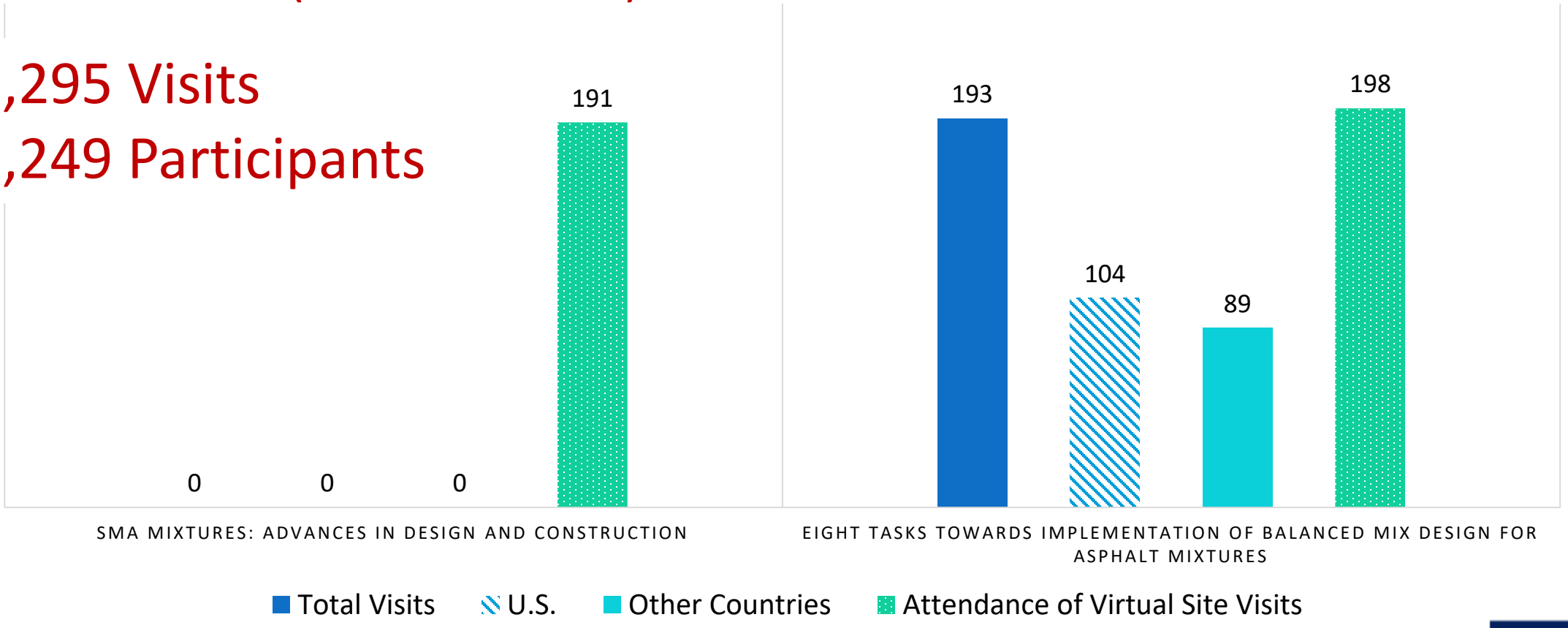
3,295 Visits
1,249 Participants



Innovation Area C: Design, Specifications, and Practices (DS&P) Webinars (continued)

U.S. Department of Transportation
Federal Highway Administration

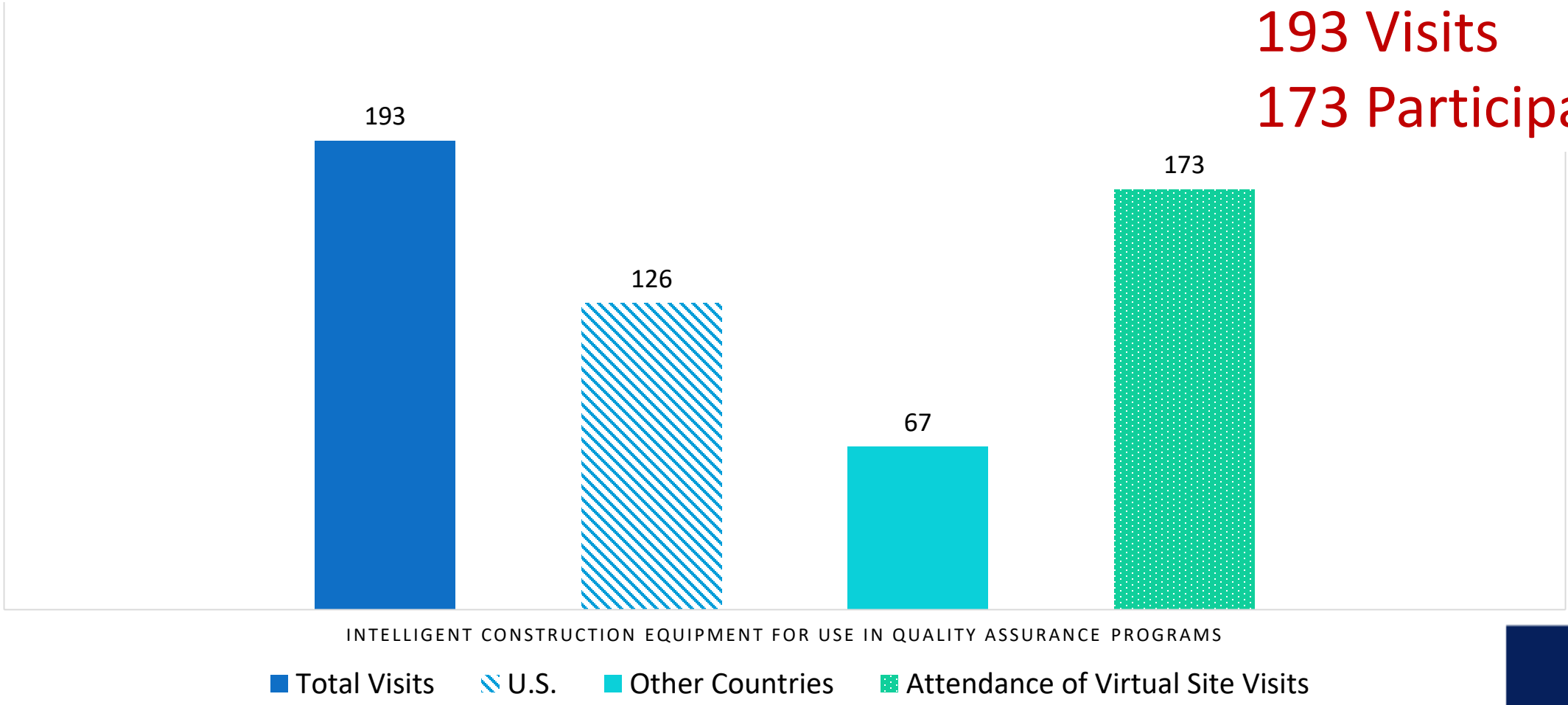
3,295 Visits
1,249 Participants



Innovation Area E: Real-Time Pavement Production and Construction Controls Webinars

U.S. Department of Transportation
Federal Highway Administration

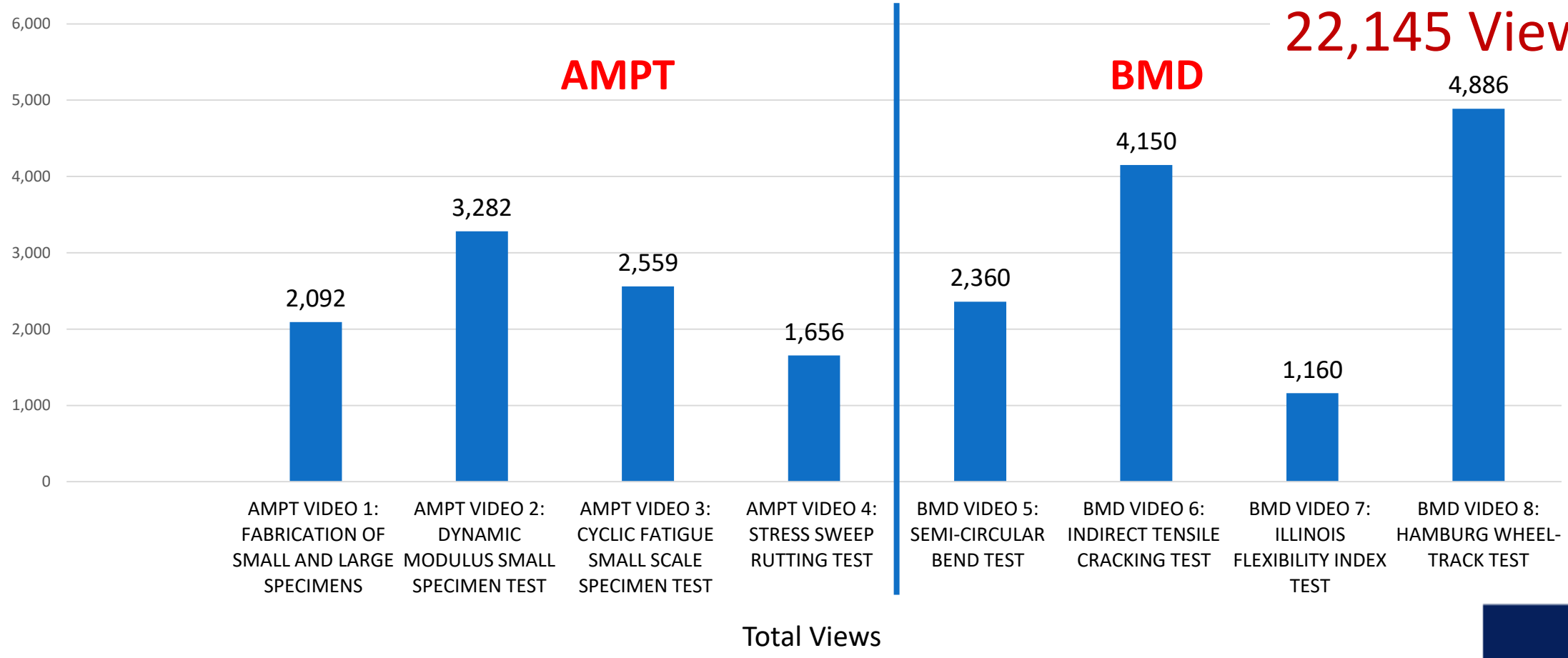
193 Visits
173 Participants



Innovation Area C: Design, Specifications, and Practices (DS&P) Videos

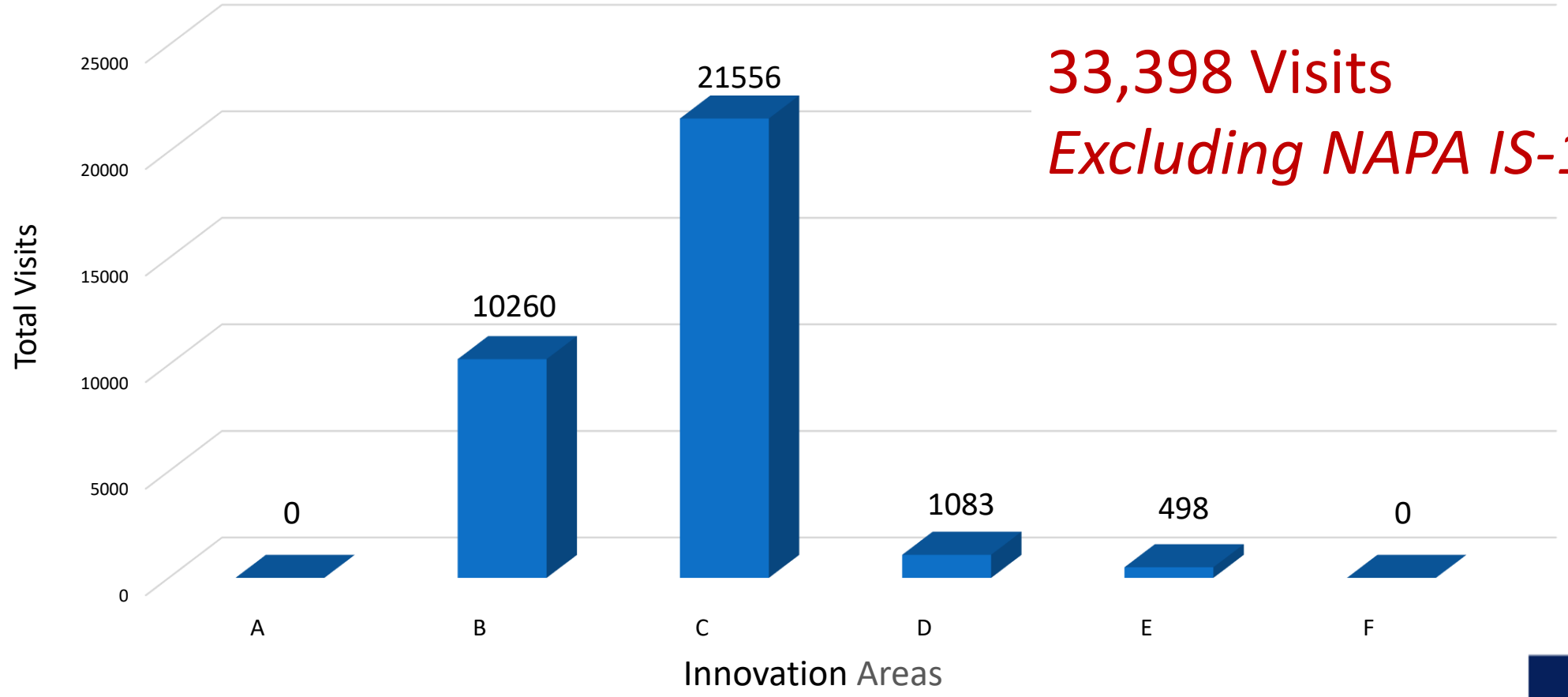
U.S. Department of Transportation
Federal Highway Administration

22,145 Views



All Innovation Areas: Publications

U.S. Department of Transportation
Federal Highway Administration

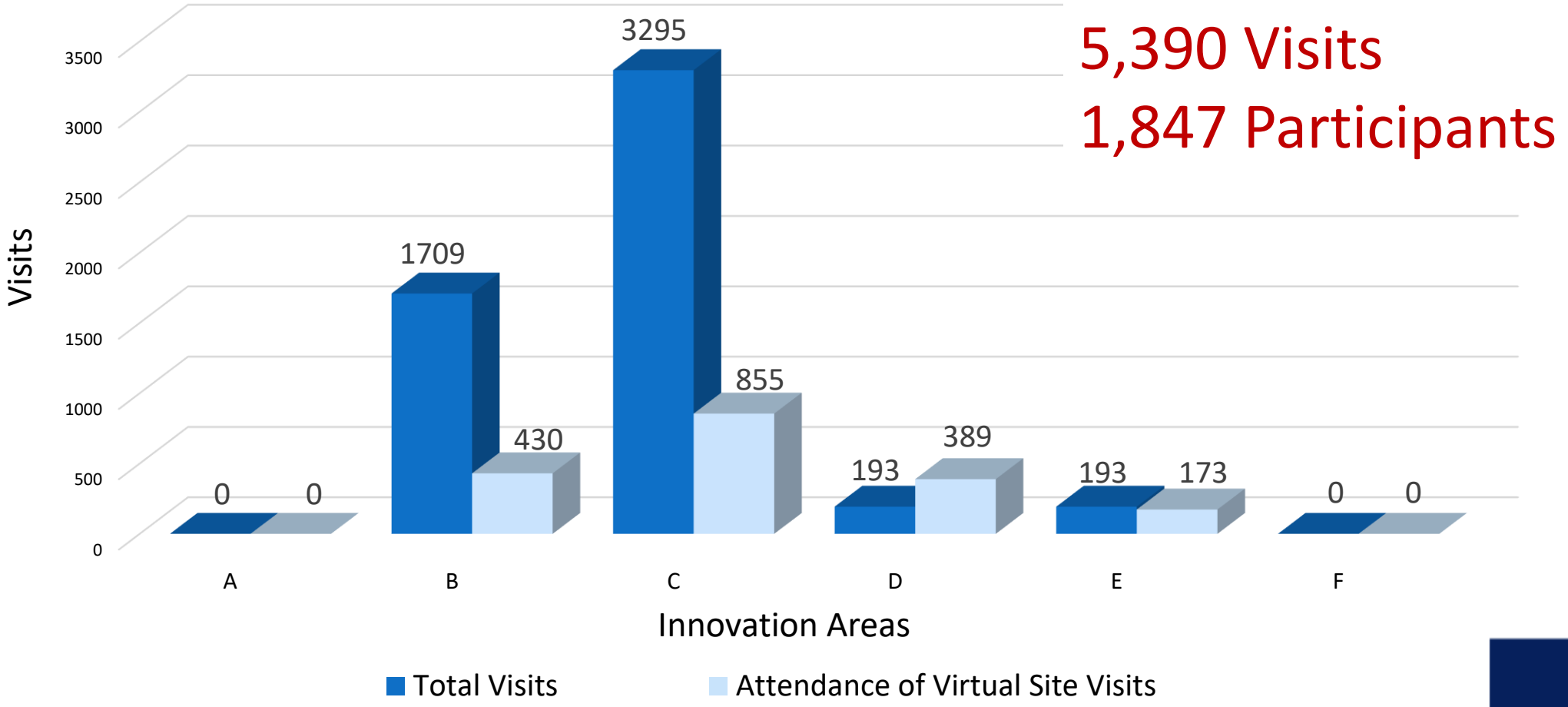


33,398 Visits

Excluding NAPA IS-138

All Innovation Areas: Webinars

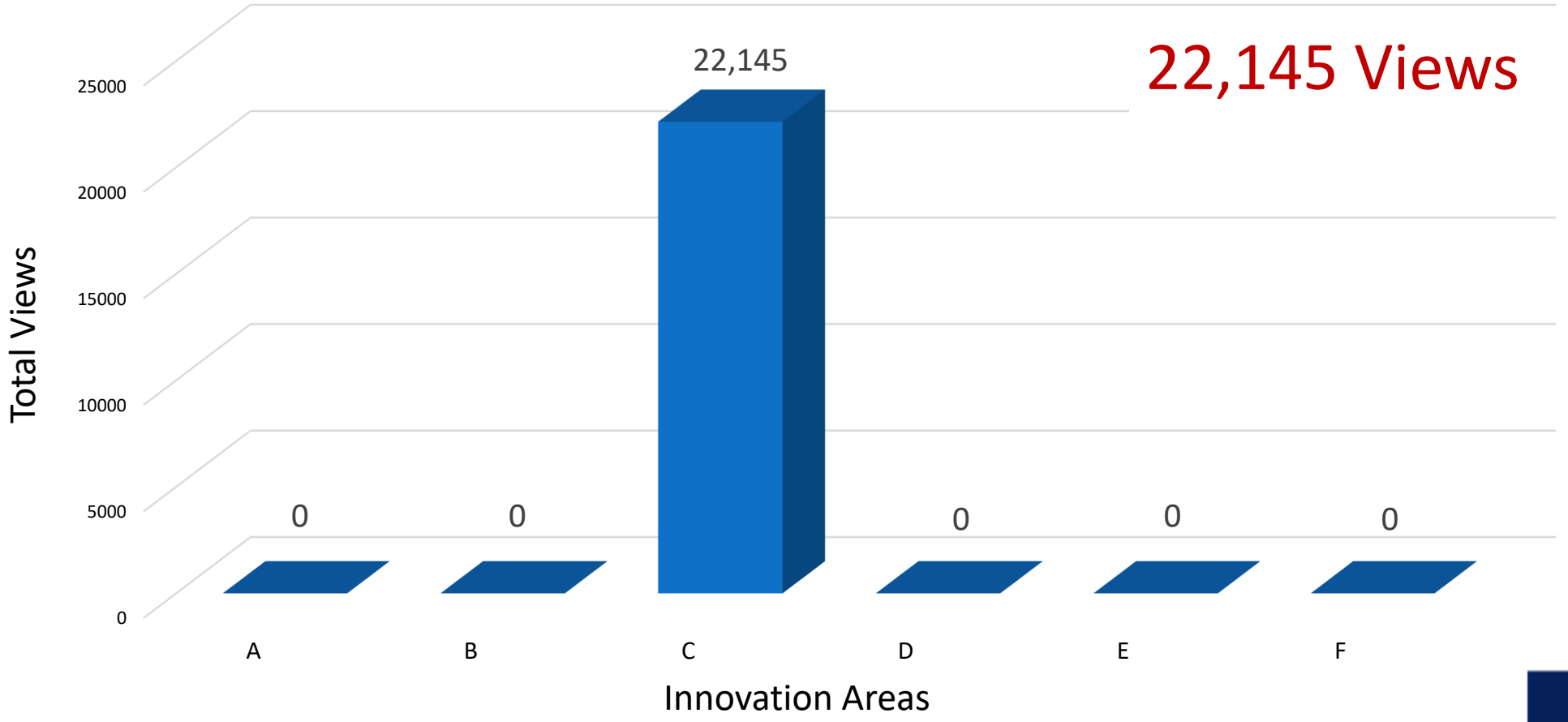
U.S. Department of Transportation
Federal Highway Administration



5,390 Visits
1,847 Participants

All Innovation Areas: Videos

U.S. Department of Transportation
Federal Highway Administration



22,145 Views

Linking DDIAPT Products to the FHWA Strategic Plan

U.S. Department of Transportation
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https://highways.dot.gov/about/fhwa-strategic-plan

USDOT & FHWA Strategic Plans

U.S. Department of Transportation
Federal Highway Administration

- Strategic Goals
- Strategic Objectives
- Key Performance Indicators

- Goals & Objectives the Same
- Some KPI's Differ Slightly

U.S. DOT Strategic Goals

As reflected in its Strategic Plan, FHWA derives its direction from the six U.S. DOT Strategic Goals.

Climate and Sustainability

Tackle the climate crisis by ensuring that transportation plays a central role in the solution. Substantially reduce greenhouse gas emissions and transportation-related pollution and build more resilient and sustainable transportation systems to benefit and protect communities.

Transformation

Design for the future. Invest in purpose-driven research and innovation to meet the challenge of the present and modernize a transportation system of the future that serves everyone today and in the decades to come.

Organizational Excellence

Strengthen our world-class organization. Advance the Department's mission by establishing policies, processes, and an inclusive and innovative culture to effectively serve communities and responsibly steward the public's resources.

https://highways.dot.gov/about/fhwa-strategic-plan

USDOT & FHWA 2022-2026 Strategic Plans

- Strategic Goals
- Strategic Objectives
- Key Performance Indicators

- Goals & Objectives the Same
- Some KPI's Differ Slightly

Strategic Goals	Strategic Objectives	Key Performance Indicators
Safety	• Safe Design • Safe System • Safe Public • Safe Workers • Critical Infrastructure Cybersecurity	1. Reduce 66% of Motor Vehicle-Related Fatalities by 2040 to Demonstrate Progress to Achieve Zero Roadway Fatalities 2. By September 30, 2023, Reduce the Rate of Motor Vehicle Fatalities from 1.36 per 100 Million Vehicle Miles Traveled (VMT) as of October 1, 2021, to No More than 1.22 per 100 Million VMT
Economic Strength and Global Competitiveness	• High Performing Core Assets • Resilient Supply Chains • System Reliability and Connectivity • Job Creation and Fiscal Health • Global Economic Leadership	• …
Equity	• Expanding Access • Wealth Creation • Power of Community • Proactive Intervention, Planning, and Capacity Building	• …

USDOT & FHWA 2022-2026 Strategic Plans

- Strategic Goals
- Strategic Objectives
- Key Performance Indicators

Strategic Goals	Strategic Objectives	KPI's
Safety	• Safe Design • Safe System • Safe Public • Safe Workers • Critical Infrastructure Cybersecurity	
Economic Strength and Global Competitiveness	• High Performing Core Assets • Resilient Supply Chains • System Reliability and Connectivity • Job Creation and Fiscal Health • Global Economic Leadership	
Equity	• Expanding Access • Wealth Creation • Power of Community • Proactive Intervention, Planning, and Capacity Building	
Climate and Sustainability	• Path to Economy-Wide Net-Zero Emissions by 2050 • Infrastructure Resilience • Climate Justice and Environmental Justice	
Transformation	• Matching Research and Policy to Advance Breakthroughs • Experimentation • Collaboration and Competitiveness • Flexibility and Adaptability	
Organizational Excellence	• Customer Service • Workforce Development • Oversight, Performance and Technical Assistance • Data-Driven Programs and Policies • Sustainability Initiatives	

USDOT & FHWA 2022-2026 Strategic Plans

Strategic Goals	Strategic Objectives	Key Performance Indicators (KPI's)
Climate and	• Path to Economy-Wide Net-	1. Reduce Transportation Emissions in Support of Net-Zero Emissions

Strategic Goals	Strategic Objectives	Key Performance Indicators (KPI's)	DDIAPT Products Supporting FHWA Strategic Goals, Objectives & KPI's
Climate and Sustainability	• Path to Economy-wide Net-Zero Emissions by 2050 • Infrastructure Resilience • Climate Justice and Environmental Justice	1. Reduce transportation emissions in support of net-zero emissions economy-wide by 2050. 2. Ensure that the benefits of at least 40% of U.S. DOT investments in the areas of clean energy and energy efficiency, clean transportation, and the remediation and reduction of legacy pollution flow to disadvantaged communities. 3. By 2026, 50% of States/MPOs have developed resilience improvement plans.	• Successful use of High RAP in asphalt mixtures: Technical report, Tech Brief, Webinar • Recycled tire rubber - Hybrid GTR binders and dry added GTR - How to use them in asphalt pavement mixtures; Technical report, Tech Brief, Webinar • Successful Practices and Lessons Learned When Using RAS in Asphalt Mixtures: Technical report, Tech Brief, Webinar • Asphalt Pavement Recycling Technologies: Technical report, Tech Brief, Webinar • Alternative contracting methods for pavement preservation projects: White paper • BMD of Asphalt Mixtures: Technical reports, Tech Briefs, Peer Exchanges, Videos, Workshops, webinars • Etc.

USDOT & FHWA 2022-2026 Strategic Plans

- Strategic Goals
- Strategic Objectives
- Key Performance Indicators

Strategic Goals	Strategic Objectives	DDIAPT Items
Safety	• Safe Design • Safe System • Safe Public • Safe Workers • Critical Infrastructure Cybersecurity	• Innovation Areas B&C • 12 Subtasks
Economic Strength and Global Competitiveness	• High Performing Core Assets • Resilient Supply Chains • System Reliability and Connectivity • Job Creation and Fiscal Health • Global Economic Leadership	• Innovation Areas B&C • 8 Subtasks
Equity	• Expanding Access • Wealth Creation • Power of Community • Proactive Intervention, Planning, and Capacity Building	
Climate and Sustainability	• Path to Economy-Wide Net-Zero Emissions by 2050 • Infrastructure Resilience • Climate Justice and Environmental Justice	• Innovation Areas B&D • 5 Subtasks
Transformation	• Matching Research and Policy to Advance Breakthroughs • Experimentation • Collaboration and Competitiveness • Flexibility and Adaptability	• Innovation Areas B&E • 4 Subtasks
Organizational Excellence	• Customer Service • Workforce Development • Oversight, Performance and Technical Assistance • Data-Driven Programs and Policies • Sustainability Initiatives	

Summary

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Federal Highway Administration

- Cooperative Agreement Wrapping Up Deliverables
- Deliverables
  - Aligned with and Support USDOT & FHWA Strategic Plans
  - Available to All at FHWA & UNR Websites
  - …
- Another FHWA/UNR Coop Agreement in place (Fall 2023)
  - Getting Started
  - More to come…

AIEI
ASPHALT | INNOVATE | ENLIGHTEN | IMPLEMENT

Thank you to *All* Involved

U.S. Department of Transportation
Federal Highway Administration

- Coop Agreement Team Entities, & Individuals
  - FHWA
  - UNR
  - ARA
  - PTSi
- Entities & Individuals Engaged/Visited/Interviewed/Participated/…
- Your Engagement & Input Improved Outcomes & Product Quality
- Deliverables Have Been Far-Reaching & Impactful
- Deliverables Support USDOT and FHWA 2022-2026 Strategic Plan Elements
- Thank You All for *Your* Contributions, Support & Interest

U.S. Department of Transportation
Federal Highway Administration

ACCELERATED IMPLEMENTATION AND DEPLOYMENT OF ASPHALT PAVEMENT TECHNOLOGIES

The Federal Highway Administration (FHWA) has an ongoing Accelerated Implementation and Deployment of Pavement Technologies (AIDPT) Program, which includes the deployment of innovative technologies to improve pavement performance and reduce agency risk. A constant challenge in the transportation community is timely and efficient deployment of these new and innovative technologies.

FEATURED PRODUCTS IN THE FOLLOWING AREAS

- Asphalt Binders
- Balanced Mix Design
- Recycled Asphalt Materials
- Asphalt Pavement Design and Construction
- Quality Assurance for Asphalt

TECHNICAL RESOURCES AVAILABLE:

- To stimulate, facilitate, and expedite the deployment and rapid adoption of new and innovative technology relating to the design, production, testing, control, construction, and investigation of asphalt pavements.
- To provide Congress and the U.S. Department of Transportation with valuable real-life data and feedback to inform future decision making.

VIEW COOPERATIVE AGREEMENT MATERIALS:
https://www.fhwa.dot.gov/pavement/asphalt/coopmaterials/

For more information or technical assistance, please contact: **Tim Aschenbrener, FHWA, timothy.aschenbrener@dot.gov.**

More information about the cooperative agreement is at: https://www.unr.edu/wrsc/tools/asphalt. This material is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange under agreement number 693JJ31850010 Development and Deployment of Innovative Asphalt Pavement Technologies.

FHWA-HIF-23-073

U.S. Department of Transportation
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DEPLOYMENT OF ASPHALT PAVEMENT TECHNOLOGIES (DAPT) WEBINAR SERIES

WHAT IS IT? The Deployment of Asphalt Pavement Technologies (DAPT) webinar series is your gateway to the latest information and implementation aspects of various asphalt pavement technologies.

HOW? Hosted by the University of Nevada, Reno and moderated by the FHWA, these webinars cover several topics such as resource responsible use of materials, quality assurance, and balanced mix design of asphalt mixtures.

WHAT SETS APART THESE SESSIONS? Open access for all, active participation in Q&A sessions, and the added benefit of earning professional development hours/continuing education units (PDH/CEU).

ASPHALT BINDER

- Delta Tc (ΔTc) Binder Specification Parameter
- Multiple Stress Creep and Recovery (MSCR) Implementation and Transition
- Responsible Use of Re-refined Engine Oil Bottoms and Polyphosphoric Acid Modifications of Binders

BALANCED MIX DESIGN

- Adjusting Asphalt Concrete Mix Designs to Optimize Laboratory Performance
- Eight Tasks Toward Implementation of Balanced Mix Design for Asphalt Mixtures
- Industry Practices and Suggestions for Adjusting Asphalt Mixtures to Meet Balanced Mix Design (BMD) Specifications
- BMD Peer-To-Peer Exchanges: Findings and Challenges to Implementation

PAVEMENT DESIGN AND CONSTRUCTION

- Demonstration Projects, Related Specifications, and Techniques for Improving Density
- Overcoming Obstacles to Achieve Mat Density and Improve Joint Performance
- SMA Mixtures: Advances in Design and Construction

QUALITY ASSURANCE FOR ASPHALT

- Asphalt Materials Quality Assurance Practices
- Intelligent Construction Equipment for Use in Quality Assurance Programs

RECYCLING

- Asphalt Mixture Considerations for Use of GTR Modified Asphalt Binders
- Resource Responsible Use of Recycled Tire Rubber in Asphalt Pavements
- Resource Responsible Use of High RAP (up to 50%) Asphalt Mixtures
- Successful Practices and Lessons Learned When Using Reclaimed Asphalt Shingles in Asphalt Mixtures
- Asphalt Pavement Recycling Technologies: Overview of Successful Practices

SUSTAINABILITY

- Asphalt Pavement Carbon Footprint Reduction: Overview of Techniques, Needs and Opportunities

OTHER

- DDIAPT Products: Overall Review and Impact on Strategic Goals

Visit the FHWA website for additional information and related publications at **https://www.fhwa.dot.gov/pavement/asphalt/coopmaterials/.**

For more information or technical assistance, please contact: **Tim Aschenbrener, FHWA, timothy.aschenbrener@dot.gov**.

IT'S NOT JUST A WEBINAR—IT'S AN OPPORTUNITY FOR GROWTH AND STAYING AT THE FOREFRONT OF ASPHALT PAVEMENT TECHNOLOGIES!

ALL WEBINARS ARE AVAILABLE ON-DEMAND
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Thank You

Q & A

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