



NCHRP PROJECT 20-07/349: MATERIALS ACCEPTANCE PLAN

Arizona Pavement/Materials Conference
Tempe, Arizona
November 19-20, 2014



NCHRP: AN AASHTO PROGRAM

- ⊙ Started in 1962 – 50th Anniversary was on June 19, 2012
- ⊙ Sponsored by state DOTs and DC
- ⊙ Voluntary contributions from SP&R funds
- ⊙ About \$40 million/year
- ⊙ Applied research - addresses all aspects of highways
- ⊙ Research topics are proposed by state DOTs, AASHTO committees, and FHWA
- ⊙ Panels composed of state DOTs professionals, industry, academia, and consultants monitor the research
- ⊙ Research products are intended for implementation by state DOTs and industry (provided to AASHTO for adoption or published/distributed by the NCHRP)



TYPES OF NCHRP PROJECTS

- ◎ **Research Projects**
Selected by SCOR once/year
- ◎ **Research for AASHTO Standing Committee on Highways (20-07 projects/tasks)**
Selected by NCHRP Project Panel SP20-07
- ◎ **Synthesis of Information Related to Highway Problems (20-05 synthesis topics)**
Selected by NCHRP Project Panel SP20-05



NCHRP PROJECT 20-07/TASK 349: BACKGROUND & OBJECTIVE

- ◎ **Background:** Materials acceptance plans for traditional contracts (design-bid-build) have been well defined and used by highway agencies for many years as a basis for pay items and material quantities. However, materials acceptance plans have not been well defined for many of the relatively new procurement methods (alternative contracting methods).
- ◎ **Objective:** Develop guidelines for use in preparing acceptance plans for materials procured and utilized on transportation construction projects using alternative contracting strategies.



NCHRP PROJECT 20-07/TASK 349: RESEARCH TEAM

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***Note: Presentation material is extracted from
the researchers' progress report.***



DELIVERY SYSTEMS

- ◎ **Traditional Contracting:**
Design-Bid-Build (DBB)
- ◎ **Alternative Contracting:**
Design-Build (DB)
Warranty (W)
Design-Build-Operate-Maintain (DBOM)
Others (Construction Manager/General Contractor,
Indefinite Delivery/Indefinite Quantity)



TRADITIONAL VERSUS ALTERNATIVE DELIVERY

Traditional Delivery

- Method Specification
- Low bid
- Unit-prices
- Separation of services
- Standard Delivery
- Owner retains majority risk

Alternative Delivery

- Performance Specification
- Best-value or Qualification-based selection (QBS)
- Lump sum, Guaranteed maximum price (GMP)
- Integrated services (design, construction, O&M)
- Accelerated delivery
- Contractor assumes greater risk for quality



AGENCY & CONTRACTOR ROLES (BY ACTIVITY)

- **Design:** agency (DBB, W); contractor (DB with criteria by agency, BDOM)
- **Quality management:** contractor (all)
- **Verification testing:** agency (all)
- **Acceptance at end of construction:** agency (DBB, DB, W)
- **Post-construction maintenance & asset management:** agency (DBB, DB, DBOM), contractor (W)
- **Performance criteria:** agency (DBOM)
- **Performance monitoring:** contractor and agency (DBOM)



AGENCY AND CONTRACTOR ROLES

Agency

- Design (DBB, W)
- Verification testing (all)
- Acceptance at end of construction (DBB, DB, W)
- Post-construction maintenance & asset management (DBB, DB, DBOM)
- Performance criteria (DBOM);
- Performance monitoring (DBOM)

Contractor

- Design (DB with criteria by agency, BDOM)
- Quality Management (all)
- Warranty (W)
- Post-construction maintenance & asset management (W)
- Performance monitoring (DBOM)



DELIVERY SYSTEMS: PERFORMANCE LEVEL

- End-result requirements (DBB, DB, W)
- Lower level requirements as necessary (DBB)
- Functional parameters (W: during warranty period, DBOM)
- User needs (DBOM)



DELIVERY SYSTEMS: OBJECTIVES/FEATURES

Design-Bid-Build

- Focus on material properties and construction practice for long-term performance
- Promote enhance quality/durability through payment adjustments

Design-Build

- Similar to DBB but with stringent limits/tolerances in exchange for providing contractor more flexibility

Warranties

- Monitor/evaluate performance over warranty period
- Protect against defective work and premature failure

Design-Build-Operate-Maintain

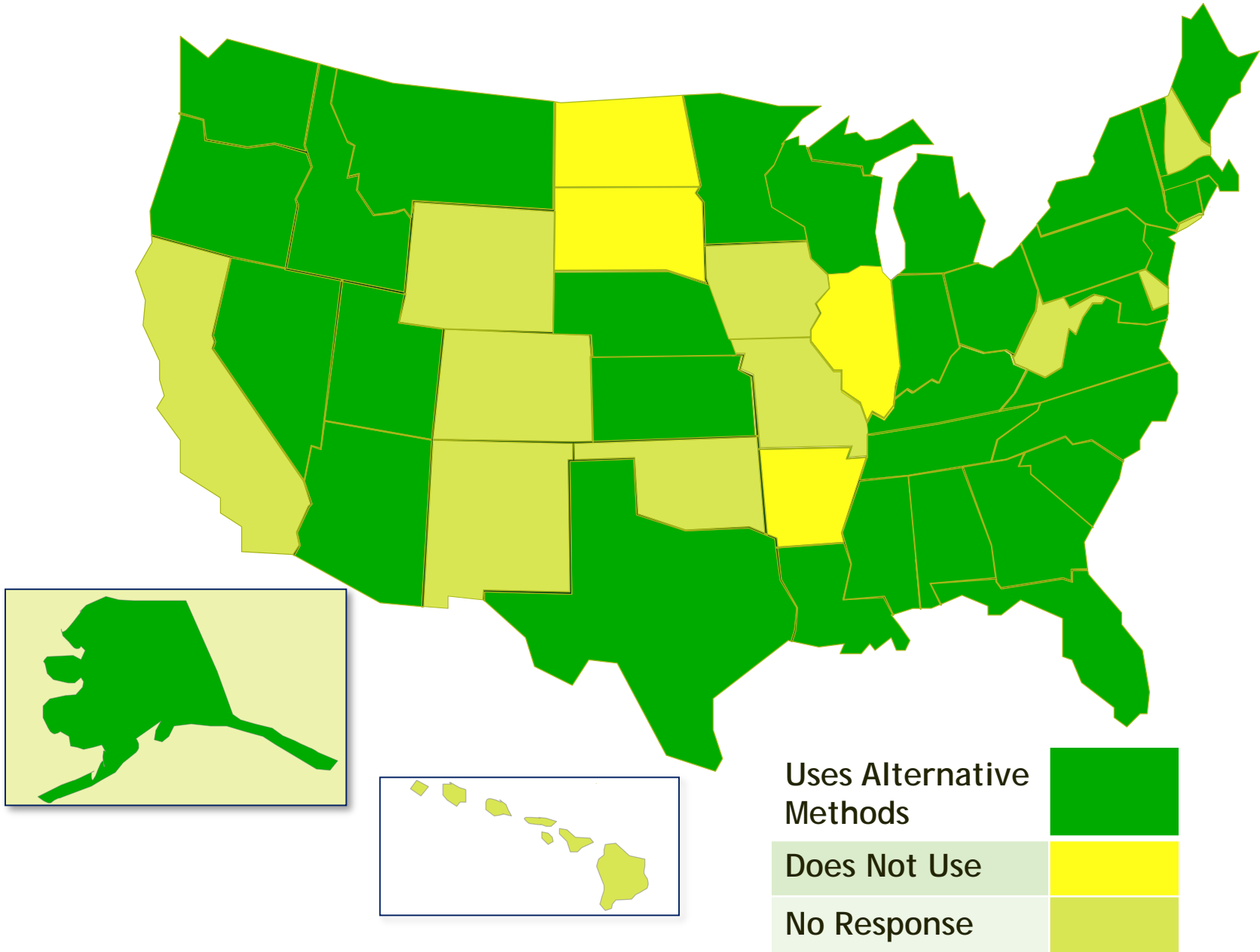
- Monitor/evaluate performance over service life
- Allocate whole-life performance risk to the contractor



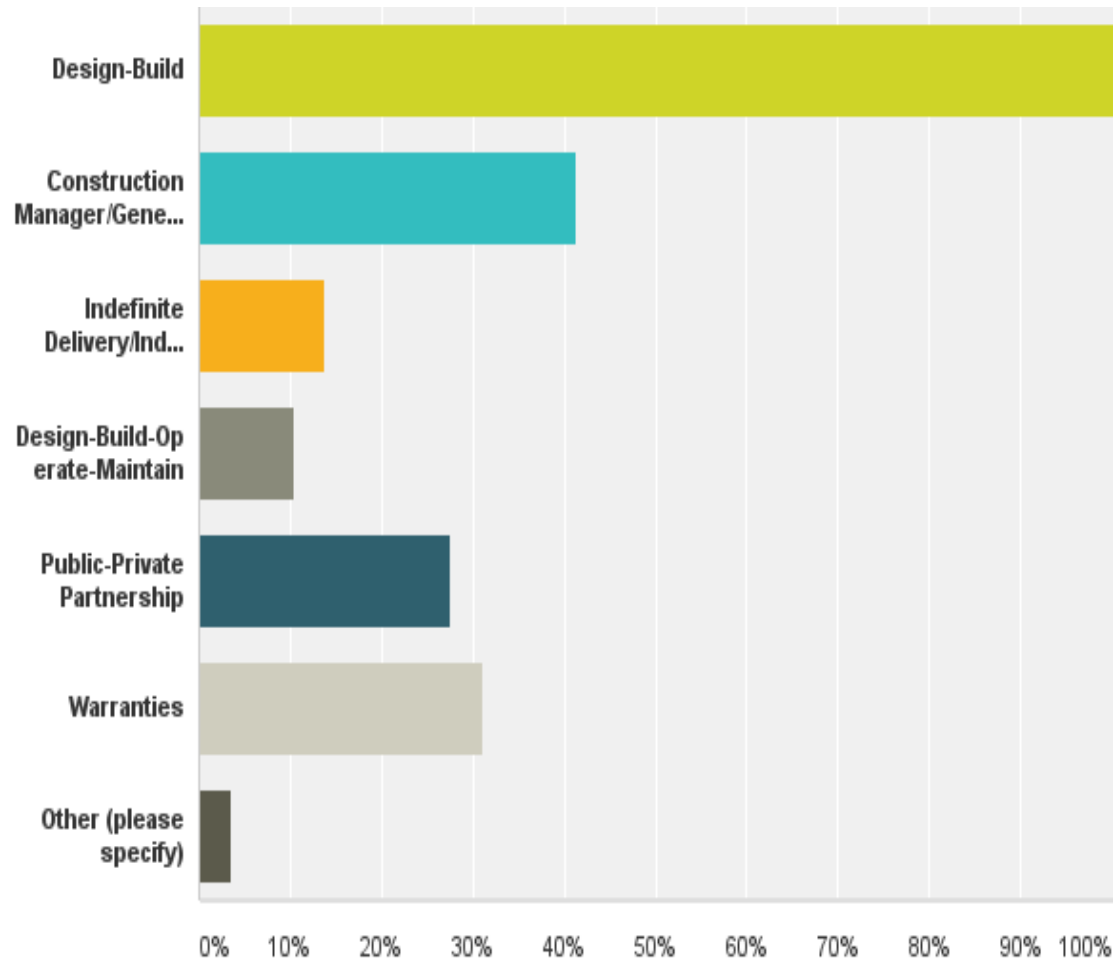
MATERIALS ACCEPTANCE PLAN DEVELOPMENT

- Establish Measurement Strategy
- Select Appropriate Parameters
- Specify Test or Evaluation Method
- Establish a Sampling Plan
- Determine Measurement Frequency
- Determine the Performance Measure to Use
- Set Performance Limits/Thresholds
- Assign Quality Management Responsibilities

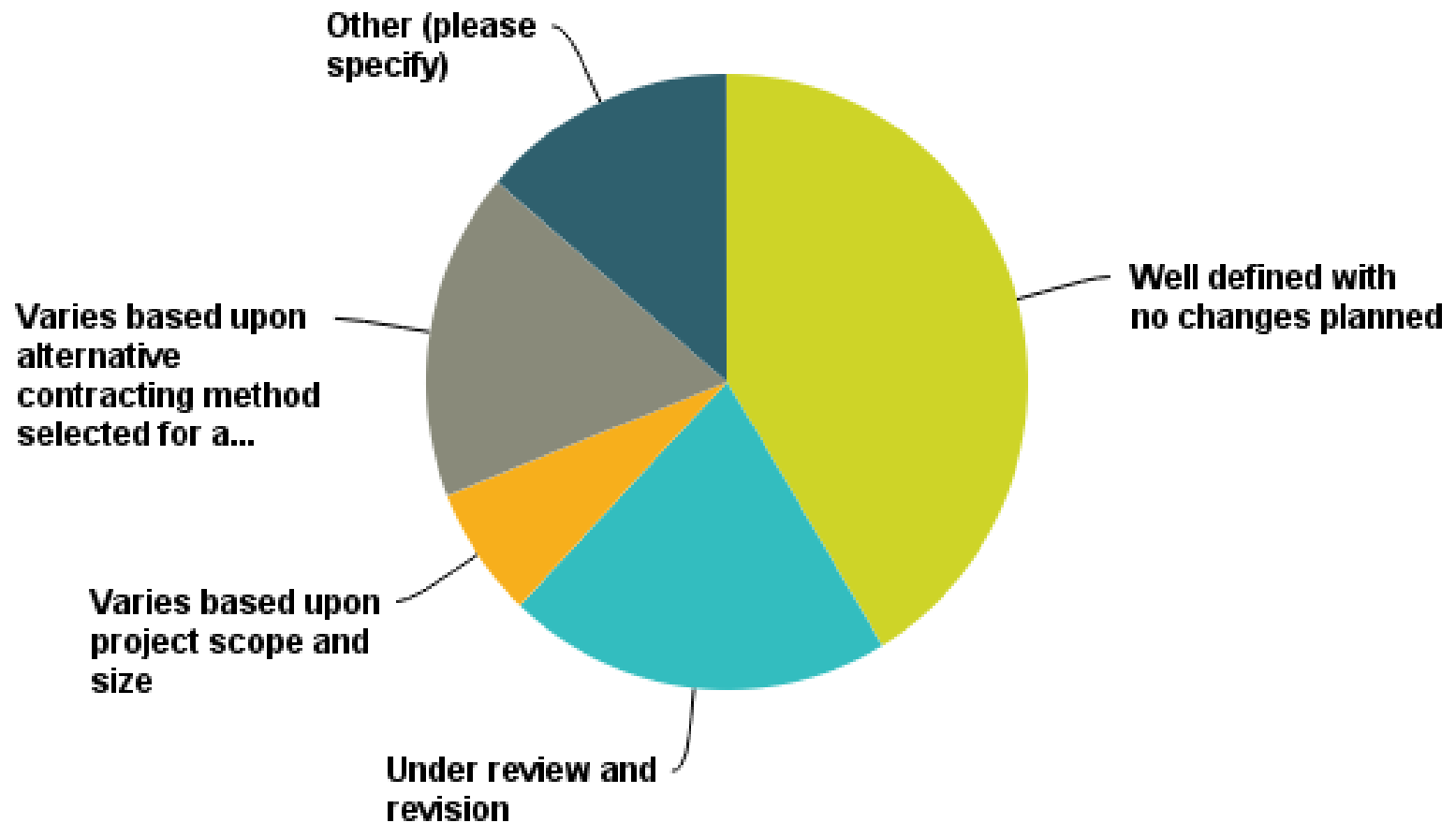
Use of Alternative Delivery Methods



ALTERNATIVE DELIVERY METHODS



AVAILABILITY OF MATERIALS ACCEPTANCE PROCESSES





FINDINGS TO DATE

- Most states utilize alternative delivery systems to some degree
- The Code of Federal Regulations describes requirements for agencies materials acceptance program
- FHWA reviews have found “numerous and significant opportunities for improvement in states QA programs”
- Twelve states responded as having well-defined materials acceptance program; no changes are planned



STATUS AND PRODUCT

- Status: In Progress, completion expected in late April 2015
- Product: Guidelines for use in preparing acceptance plans for materials procured for transportation construction projects using alternative contracting strategies (to guide highway agencies in preparing and implementing the materials acceptance plans needed to better verify materials quality and ensure use of appropriate materials in highway construction projects)
- Will be forwarded to the AASHTO Highway Subcommittee on Materials
- Possible adoption as a Standard Practice



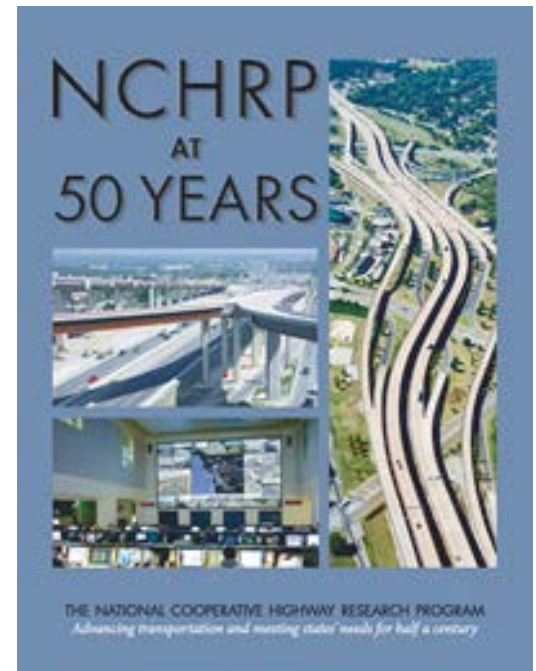
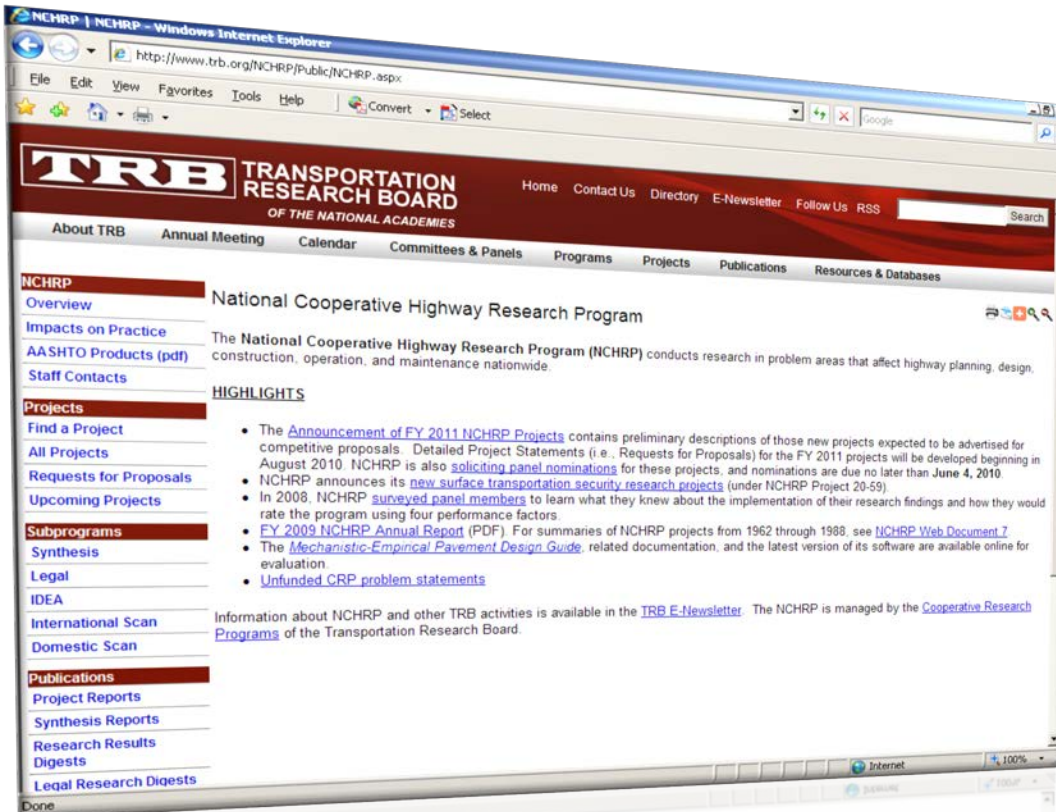
ACKNOWLEDGEMENTS

- State DOTs/AASHTO
- Members of AASHTO SOM and its Technical Section 5c, Quality Assurance, Data Evaluation and Acceptance Plans
- FHWA
- NCHRP Panel Members
- Research Team





HTTP://WWW.TRB.ORG/NCHRP





CONTACT INFORMATION

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Advancing transportation and meeting states' needs for half a century
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TRB 94TH ANNUAL MEETING

JANUARY 11-15, 2015

The Transportation Research Board (TRB) 94th Annual Meeting will be held in Washington, D.C. at its new venue, the Walter E. Washington Convention Center. The information-packed program is expected to attract 12,000 transportation professionals from around the world to Washington, D.C., January 11-15, 2015.