

2015 Pacific Northwest
BRIDGE INSPECTORS'
Conference



April 6 - 8, 2015

Hilton Portland and Executive Towers
Portland, Oregon

Hosted by the Federal Highway Administration, Washington State Department of Transportation, Oregon Department of Transportation, Nevada Department of Transportation, Idaho Transportation Department, and the U.S. Forest Service.

2015 Pacific Northwest BRIDGE INSPECTORS' Conference

MONDAY

APRIL 6

6:00 PM REGISTRATION & DESSERT SOCIAL

TUESDAY

APRIL 7

7:00 AM REGISTRATION & MORNING
REFRESHMENTS

8:00 AM SESSION 1: WELCOME, KEYNOTE,
FEATURED, AND DISTINGUISHED
PRESENTATIONS

Pavilion

Moderator: Tim Rogers, FHWA Oregon

Opening Remarks & Welcome

Jeff Swanstrom, ODOT and Tim Rogers, FHWA OR



Keynote

Yesterday, Today and Tomorrow: Bridges
and Tunnels in America

Joey Hartmann, FHWA HQ



Distinguished Guest Speaker

23 Metrics: A Current Progress Report

Barry Brecto, FHWA HQ



Featured Speaker

Inspection to Preservation

Chris Keegan, WSDOT

10:00 AM EXHIBIT BREAK

Pavilion Foyer

10:30 AM SESSION 2: BRIDGE ELEMENTS

Pavilion

Moderator: Dan Gorley and Jake Legler, ITD

AASHTO Bridge Elements Inventorying Issues

Derek Soden, FHWA Resource Center

Adopting Bridge Inspection by Elements,
Challenges & Solutions

Homer Saidi and Mohan Sharma, ADOT

UDOT Transition to Current AASHTO Elements

Joshua Sletten, UDOT

12:00 PM LUNCH

Skyline Ballroom @ top of the Hilton

1:00 PM SESSION 3: DAMAGE & FATIGUE /
EMERGING TECHNOLOGIES

Pavilion

Moderator: Mike Bezner, Clackamas County, OR

Fire Damaged Bridges

Darryl Anderson, Anderson Engineering and
Surveying, Inc.

Fatigue in Ancillary Highway Structures

James Wege, WSDOT

Aerial Drones for Bridge Inspection:

Pros and Cons

Rich Hovde, David Evans and Associates, Inc.

Imaging Subsurface Damage in Bridge Decks

Glenn Washer, University of Missouri

3:00 PM EXHIBIT BREAK

Pavilion Foyer

3:30 PM SESSION 4: MOVABLE / COMPLEX
INSPECTIONS

Pavilion

Moderator: Dale Wegner, FHWA NV

Proposed Revisions to AASHTO Movable

Bridge Inspection, Evaluation, and

Maintenance Manual NCHRP Project 14-32

Scott Snelling, Parsons Brinkerhoff

Sitka Harbor and Captain Williams Moore

Bridge Stay Cable Inspections

Christopher Ligozio, KPFF Consulting Engineers

Applications of Variable Speed Drives to
Bascule Bridges, Avoidance of Damage,

and Testing of Dynamic Braking Systems

David Johnson, ODOT

5:00 PM EXHIBIT & NETWORKING RECEPTION

Pavilion Foyer



NEW ELEMENTS IN BRIDGE & TUNNEL INSPECTION



WEDNESDAY

APRIL 8

7:00 AM REGISTRATION & MORNING REFRESHMENTS

8:00 AM SESSION 5: TUNNELS
Pavilion

Moderator: *Eric Sniezek, WSDOT and Mike Premo, NDOT*

FHWA Implementation of National Tunnel Inspection Standards
Doug Blades, FHWA HQ

Tunnel Inspections Demystified: Logistics and Considerations
Jamie Schick and Bryan Duevel, Jacobs Assoc.

Pacific NW Tunnel Inspections: Twelve Years of Lessons Learned Inspecting Mechanical & Electrical Systems
Mark VanDeRee, Parsons Brinkerhoff

National Tunnel Safety Inspection Training Course Curriculum Development
Tom Ryan, Michael Baker International and Brian Leshko, HDR Engineering, Inc.

10:00 AM EXHIBIT BREAK
Pavilion Foyer

10:30 AM SESSION 6: UNDERWATER/SCOUR
Pavilion

Moderator: *Roman Peralta, WSDOT Local Programs*

The Image of an Icon: Underwater Inspection of the Golden Gate Bridge
*Daniel Stromberg, Collins Engineers, Inc.
and Wilson Lau, Golden Gate Bridge and Transportation District*

Demonstration of ODOT Software for Bridge Monitoring & Plans of Action for Scour Critical Bridges
Allan Carter, ODOT

Unknown Bridge Foundations in Oregon: A Multi-Disciplinary Approach
Edward Foltyn, ODOT

12:00 PM LUNCH
Skyline Ballroom @ top of the Hilton

1:00 PM SESSION 7: INSPECTION REQUIREMENTS / ACCESS
Pavilion

Moderator: *Holly Winston, ODOT Local Programs and Ayodele Akinola, NDOT*

Innovative Access Methods: Enabling In-depth and Fracture Critical Inspection of the St. Johns Bridge
Thomas Howell, HDR Engineering, Inc.

Oregon's Bridge Fall Arrest Cable Systems
Jeff Swannstrom, ODOT

ODOT Bridge Inspector Certification Program
Richard King, ODOT

Skagit River Bridge Collapse and Vertical Clearance Data
George Comstock, WSDOT

3:00 PM EXHIBIT BREAK
Pavilion Foyer

3:30 PM SESSION 8: LOAD RATING
Pavilion

Moderator: *Mark Sodaro, U.S. Forest Service*

Posting Bridges for Specialized Single-Unit Trucks
Bert Hartman, ODOT

Inventory Inspection and Load Rating of a Historic Vertical Lift Bridge
Matthew Lengyel, David Evans & Associates, Inc.

Closing Remarks, Most Valuable Presentation Award & Door Prizes
Harvey Coffman, WSDOT and Debbie Lehmann, FHWA WA

5:00 PM CONFERENCE ADJOURNS

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TUESDAY

APRIL 7

KEYNOTE **YESTERDAY, TODAY AND TOMORROW: BRIDGES AND TUNNELS IN AMERICA**

Joey Hartmann, FHWA Headquarters

This session will discuss lessons learned from recent highway bridge failures including recommendations resulting from investigations of the National Transportation Safety Board, MAP-21 mandated and other Federal program changes currently underway for the National Bridge Inspection Standards (and National Tunnel Inspection Standards), and perspectives for bridge and tunnel inspection heading into the next 30 years.

DISTINGUISHED SPEAKER

23 METRICS: A CURRENT PROGRESS REPORT

Barry Brecto, FHWA Headquarters

The Federal Highway Administration (FHWA) has undertaken an extensive effort over the last four years to further improve the inspection of publicly owned vehicular bridges on public roads in the United States. This presentation will provide a current summary of the results of these efforts to date. In 2011 FHWA introduced a new bridge safety initiative that uses systematic, data-driven, and risk-based reviews and analysis to improve oversight of how States perform their bridge inspections and manage overall bridge safety. The initiative replaced FHWA's prior National Bridge Inspection Program oversight practices and the annual NBIS compliance reviews conducted by FHWA Division offices in each State. FHWA now assesses bridge inspection programs using defined criteria for 23 key metrics, each of which can be linked directly to requirements of the national standards. These key metrics include inspection file records; determination of bridge load limits; qualifications of inspection personnel; procedures for underwater, fracture-critical, and complex bridge inspections; quality bridge data; and inspection frequency. The assessment process is based on objective data, statistical sampling of the data and inspection records, site reviews of bridges in the field, and defined criteria for compliance with each metric. This presentation will update the audience on the current status of the U.S. inspection program based on the experience and data obtained over the last four years.

FEATURED SPEAKER **INSPECTION TO PRESERVATION**

Chris Keegan, Washington State Department of Transportation

What happens to the information provided by the inspector? Who are the customers and how will they use the information? What is needed by the customer from the inspector to make their job easier? I will also present a summary of what is available in the area of preservation—from the Western Bridge Partnership, the Transportation Systems Preservation and Technical Services Program (TSP2), as well as the Bridge Preservation Expert Task Group.



Registration Desk & Name Tags

The Registration Desk is the place to go if you have any questions during the conference. Once you have registered and received your nametag, please wear it throughout the conference. Not only will other people get to know you, it's your ticket for all events.

Most Valuable Presentation

<https://wsu.cnf.io>

We will be using a live polling app to collect the results of the **Most Valuable Presentation Award**. Polling will be open on April 8 from 4:30 to 4:45 pm. Use your smart device to access or see Dana at the Registration Desk for assistance. You will receive two door prize drawing tickets for submitting your ballot through the polling app; simply bring your device to the registration desk showing that you voted to claim your tickets.

Evaluation

<http://goo.gl/sD6KqH>

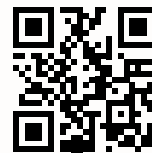
You will receive two door prize drawing tickets when you complete our online conference evaluation. Access the evaluation through the conference app or see Dana at the Registration Desk for assistance. After you have submitted your evaluation, bring your mobile device to the Registration Desk to claim your tickets. We've included a helpful guide following the presenter biographies if you wish to take notes as you go.

Mobile App

<http://goo.gl/sD6KqH>

We've created a mobile app to help you navigate the conference this year. Access it on your mobile device to view the conference schedule and get info on exhibitors, sponsors, and more.

Scan this code for convenient access to the Conference app. ▼



SESSION 2 BRIDGE ELEMENTS

AASHTO Bridge Elements Inventorying Issues

Derek Soden, FHWA Resource Center

During calendar years 2013-14, FHWA Resource Center staff were involved in training state highway agency bridge inspection staff to inventory and assess National and Bridge Management Elements as per the guidance outline in the AASHTO Manual for Element Inspection, 2013 Edition. During these training sessions participants would ask clarifying questions. If the question could not be addressed, the instructors would identify these questions as "Parking Lot Issues" so they can be deliberated upon and addressed as per the guidance outlined in the AASHTO Manual. Approximately, two hundred questions were asked that needed to be deliberated and followed up on by the instructors. The presentation will identify some of the key participant questions and outline whether they were addressed or need to be addressed by the AASHTO T-20 sub committee. Sharing these questions will help with uniformity and consistency in element data collection efforts across the states.

Adopting Bridge Inspection by Elements, Challenges & Solutions

Homer Saidi and Mohan Sharma, Arizona Department of Transportation

Arizona State has around 7,700 bridges and culverts which Arizona Department of Transportation (ADOT) tracks by an in-house bridge management software, ABISS (Arizona Bridge Inventory and Storage System), in use since 1998. ADOT is transitioning from ABISS to the AASHTO Sanctioned software BrM (aka PONTIS). The

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presentation will discuss some of the expected challenges with the transition from ABISS to the BrM software. The challenges with the transition for the inspectors will be addressed along with concerns for the potential to miss elements as part of the translation/transition to the BrM system. The presentation will also discuss the ADOT developed solutions with the auxiliary means to: 1. Ease dealing with new system, 2. Maintain statewide uniformity & consistency (Quality assurance), and 3. Efficient use of relevant new elements with defects.

UDOT Transition to Current AASHTO Elements

Joshua Sletten, Utah Department of Transportation

In July 2014, the Utah Department of Transportation (UDOT) transitioned from the 2001 CoRe elements to the recently developed National Bridge Elements contained in the AASHTO Manual for Bridge Element Inspection. The presentation discusses the improved inspection procedures and bridge management decisions from this transition. The timeframe for the transition will be discussed along with testing and training for all necessary personnel. The presentation will show the streamlined inspection recommendation process and reports that are developed to enhance decision making for the maintenance sheds and local agencies. It will also show several of the agency defined elements and the improvements to the inspection data collected. UDOT also created a Bridge Management Division that has developed various health indexes along with plan developments for every structure that identifies future bridge treatments based on bridge condition. The enhanced condition data provides more accurate condition assessments and deterioration rates. The core of these decision processes are based on accurate condition data which is facilitated by the new inspection elements.

SESSION 3 DAMAGE & FATIGUE / EMERGING TECHNOLOGIES

Fire Damaged Bridges

Darryl Anderson, Anderson Engineering and Surveying, Inc.

We have had several timber bridges damaged by fire that is somewhat unique to Eastern Oregon. One this year required shoring until a new bridge could be built. This is a little different inspection need for fire damage.

Fatigue in Ancillary Highway Structures

James Wege, Washington State Department of Transportation

During 2014, WSDOT identified several aluminum sign structures with visible signs of advancing fatigue. The number of members affected and/or the severity of defects increased between inspection cycles. In some cases, the deficient structures needed to be removed as soon as resources could reasonably be assembled. This presentation will illustrate the effects of fatigue on an aging, vulnerable inventory of ancillary highway structures.



Aerial Drones for Bridge Inspection: Pros and Cons

Rich Hovde, David Evans and Associates, Inc.

The presentation discusses the technical abilities of using Unmanned Aerial Vehicles (UAV) for inspecting large or hard-to-access transportation structures. These relatively inexpensive devices have many benefits but also come with limitations and serious consequences when things do not go as planned. Many agencies are enthusiastic about using UAVs for a multitude of tasks as they have the potential of reducing costs and improving personal safety, but Federal, State, and Local agencies have serious reservations about allowing use of this type of technology. This technology is new and it takes time to educate users, legislators, and enforcers on terminology and capabilities so intelligent conversations about drones is accomplished. Drones are the Wild West of Bridge Inspection!

Imaging Subsurface Damage in Bridge Decks

Glenn Washer, University of Missouri

This presentation will provide results of field implementation of a new infrared thermography method based on ultra-time domain (IR-UTD) imaging. Detection of damage in bridge decks is an important aspect of accurate condition assessment and identifying preservation needs. Traditional methods such as chain dragging or impact echo can be effective, but require traffic control to implement and results can vary between different operators. This presentation will provide results from field testing of IR-UTD technology completed in conjunction with bridge deck preservation using epoxy injection of delaminations. The results illustrate the application of this new technology for accurately characterizing the area and extent of subsurface damage. These results were verified using detailed sounding and borings in the bridge deck to confirm the location and extent of damage. This new technology differs from traditional IR imaging technology because it uses time-domain image processing of thermographic images collected over time to overcome limitations of traditional IR technologies, such as the need for optimum weather conditions and the inability to work through overlays. The IR-UTD technology does not require optimum weather conditions, is capable of imaging subsurface damage through overlays, and does not require traffic control to implement. This presentation will focus on the field application of the technology in conjunction with State DOTs.

SESSION 4 MOVABLE / COMPLEX INSPECTIONS

Proposed Revisions to AASHTO Movable Bridge Inspection, Evaluation, and Maintenance Manual NCHRP Project 14-32

Scott Snelling, Parsons Brinkerhoff

The current AASHTO Movable Bridge Inspection, Evaluation, and Maintenance Manual (Manual), published in 1998, no longer reflects the latest thinking and developments in bridge design and evaluation, and has lost much of its relevance in addressing the inspection, evaluation, and maintenance of the nation's inventory of movable bridges. Mr. Snelling is currently participating in the National Cooperative Highway Research

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Program (NCHRP) Project 14-32 Proposed Revisions to the AASHTO Movable Bridge Inspection, Evaluation, and Maintenance Manual. Examples of significant developments since the 1998 publication of the manual include Load Resistance Factor Design probability-based methods and element level bridge inspection techniques. Examples of gaps found in the current manual include providing consistent recommendations for the methods and scopes of mechanical and electrical inspections and evaluations. The NCHRP Project 14-32 seeks to resolve these gaps and incorporate developments into the updated manual.

Sitka Harbor and Captain Williams Moore Bridge Stay Cable Inspections

Christopher Ligozio, KPFF Consulting Engineers

The Sitka Harbor (SHB) and William Moore (WMB) Bridges, completed in 1970 and 1975 respectively, were the first cable stayed highway bridges in the US and among the first in North America. The SHB carries the only road between the town of Sitka and the Sitka regional airport. The WMB is part of the Klondike highway and is a critical link between Skagway, Alaska and Whitehorse, British Columbia serving tourism throughout the summer and local heavy industry year-round. Although the bridges have differing structural configurations and are located in different environments in SE Alaska, both bridges are unique in the use of the galvanized wire rope-style stay cables with pin-connected cast zinc anchorages. KPFF Consulting Engineers was retained by the Alaska Department of Transportation and Public Facilities to perform an in-depth inspection and evaluation of the stay cable arrays of both bridges. The project team's goal was to evaluate the overall condition of the cable array and identify areas of distress, corrosion, or underperformance. The evaluation included in-situ cable force measurement utilizing a time-history vibration technique, full hands-on visual inspection of the cable free lengths and anchorages, non-destructive testing of the cables, including magnetostrictive sensor based guided ultrasound inspection of the cable free lengths, remaining zinc thickness measurements, ultrasonic testing of spanner nuts and pins, and geometric survey of the bridges. Given the remote locations of both structures, limited window for agreeable weather to complete the inspection and their critical importance as vital transportation links careful planning and logistics were required to successfully complete these complex bridge inspections. Additionally, an inspection protocol was developed outlining the interval and scope of future cable inspections.

Applications of Variable Speed Drives to Bascule Bridges, Avoidance of Damage, and Testing of Dynamic Braking Systems

David Johnson, Oregon Department of Transportation

ODOT has performed several major movable bridge renovations in the last decade. In the first of these renovations several of the original open type gears in the bridge were replaced with new re-manufactured open type gears of the same type and the original drive motors and controller were replaced with new Variable Frequency Drives and motors. The renovated drive system appeared to function extremely well for a couple of months after which it became increasingly noisy. Inspection of the new manufactured gears revealed that they were in the process of galling and their complete failure appeared imminent. The new bridge control system provided information not previously available. The motor drives were capable of obtaining a real time torque estimate of each drive motor and accurate real time bridge angle information



was obtained from a resolver that monitored bridge angle. The information obtained and its analysis aided ODOT engineers in understanding and eliminating not only this problem but in avoiding future problems as well. If an electrical power outage or electrical failure was to occur the bridge crew could simply release the mechanical brakes and the bridge would seat. Modern bridge control allows for extremely precise speed control. This high precision motor speed control is the result of a feedback system which enables the torque of the drive motors to rapidly change in response to changes in motor loading conditions. Operating time can be very important on some bridges and there are safety related trade-offs involved. Rapid bridge operations can require significant transfers of energy both into and out of the bridge structure. In these cases acceleration, deceleration, dynamic motor braking systems and the application of the over-speed relaying and other safety systems are important. Dynamic system type Information is needed. This presentation describes the data acquisition and analysis methods ODOT has developed and is currently using.

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WEDNESDAY

APRIL 8

SESSION 5 | TUNNELS

FHWA Implementation of National Tunnel Inspection Standards

Doug Blades, FHWA Headquarters

Presentation on the National Tunnel Inspection Standards (NTIS), the Tunnel Operations, Maintenance, Inspection and Evaluation (TOMIE) Manual, and the Specifications for the National Tunnel Inventory (SNTI). With the anticipated publication of the NTIS, TOMIE and SNTI, this presentation will provide an overview of highlights of the NTIS, TOMIE and SNTI as applicable to those performing tunnel inspection. The NTIS details the regulation that requires tunnel inspections in the United States. This presentation will highlight organizational requirements for a tunnel inspection program, personnel qualifications for tunnel program managers, team leaders and inspectors, including the national tunnel certification requirement, inspection intervals, and documentation and reporting requirements for tunnel inspection. The TOMIE details recommended procedures for operating, maintaining, inspecting and performing structural evaluations of tunnels. The presentation will mention the three chapters on operating, maintaining and performing structural evaluations and then focus in on key items on inspection. This presentation provides further details on procedures for inspecting tunnels, general information on defects and conditions, and recommended safety procedures to follow while performing tunnel inspections. The SNTI details the required data to be submitted for the National Tunnel Inventory. This data is divided into two main categories: inventory items and elements. The inventory items are items that describe a tunnel's location and other features that typically do not change throughout the life of the tunnel. The elements section details what elements to be tracked within a tunnel and how to classify the condition of the elements.

Tunnel Inspections Demystified: Logistics and Considerations

Jamie Schick and Bryan Duevel, Jacobs Assoc.

Infrastructure managers are often responsible for tunnels within their system inventory that require periodic inspection. Agencies typically have great expertise with the inspection of bridges and retaining structures, but do not with tunnels, which may make up less than 1% of the total structure inventory. Inspection of tunnels has much in common with bridge inspections; however they are fundamentally different in a number of areas. Tunnel inspections often require extensive planning and coordination to implement. Planning considerations may include traffic control, track time (in the case of rail), time constraints, confined space entry, and emergency response plans. The types and characterization of tunnel defects also differ from bridges. For example, tunnel lining cracking is not always bad; the severity is strongly related to its position and orientation relative to the tunnel axis. This presentation highlights some of the unique aspects of planning and performing tunnel inspections, and what types of defects are critical. The presentation also discusses observations from three recent inspections of ODOT tunnels.



Pacific NW Tunnel Inspections: 12 Years of Lessons Learned Inspecting Mechanical & Electrical Systems

Mark Vanderee, Parsons Brinkerhoff

This presentation covers the early years of the Washington State inspection program for tunnel mechanical, electrical, and lighting systems. The program begins in 2002 and develops, expands and matures in subsequent years. The presentation touches on each of six in-depth tunnel inspections conducted from 2002 through 2014. These are the first independent in-service inspections performed on the mechanical or electrical systems of these structures. Each in-depth inspection saw a refinement of inspection techniques from other states including applications of non-destructive and destructive testing. Practical lessons were learned and addressed with each tunnel inspection and unique features of each structure were noted for future reference. The presentation focuses on mechanical, electrical and lighting systems; although, associated disciplines such as traffic control and structural elements are included.

National Tunnel Safety Inspection Training Course Curriculum Development

Tom Ryan, Michael Baker International and Brian Leshko, HDR Engineering, Inc.

Recognizing that the safety and security of the Nation's tunnels are of paramount importance, Congress declared in Moving Ahead for Progress in the 21st Century Act (MAP-21), and in the vital interest of the country, to inventory, inspect and improve the condition of the Nation's highway tunnels. The Federal Highway Administration (FHWA) has developed, over the last five years, three Tunnel Inspection Regulations: National Tunnel Inspection Standards (NTIS), Tunnel Operation, Maintenance, Inspection and Evaluation (TOMIE) Manual, and Specifications for the National Tunnel Inventory (SNTI). In addition, the FHWA is developing FHWA-NHI Course 130110 Tunnel Safety Inspection to provide instructor-led comprehensive training for tunnel inspectors, engineers and owners in accordance with the NTIS. The course development team includes FHWA, NHI (National Highway Institute), Michael Baker International and HDR, Inc., with Subject Matter Experts (SMEs) for civil/structural, mechanical and electrical disciplines. Engility Corporation provides expertise in gaming simulation to develop the Virtual Tunnel Inspection (VTI) Computer Based Training (CBT) capstone exercise. The tunnel safety inspection course is comprised of modules covering Overview of Tunnel Inspection, Tunnel Inspection Fundamentals, Inspection of Structural Tunnel Elements, Inspection of Civil Tunnel Elements, Inspection of Mechanical System Tunnel Elements, Inspection of Electrical and Lighting System Tunnel Elements, Inspection of Signage System Tunnel Elements, Inspection of Fire/Life Safety/Security System Tunnel Elements and includes the VTI Exercise. The information presented will be useful for inspectors and inspection program managers who want to develop or improve their tunnel inspection program.

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SESSION 6 UNDERWATER/SCOUR

The Image of an Icon: Underwater Inspection of the Golden Gate Bridge

Daniel Stromberg, Collins Engineers, Inc. and Wilson Lau, Golden Gate Bridge and Transportation District

When it came time to inspect the Golden Gate Bridge below water, the Golden Gate Bridge Highway and Transportation District chose to incorporate a relatively new, two-fold approach, which included hands-on diving inspection in conjunction with state-of-the-art underwater acoustic imaging. With this approach in mind, in the spring of 2014 throughout two week long inspection periods, the iconic Golden Gate Bridge received an underwater structural safety inspection of its north and south tower piers. The in-depth investigation included commercial diving operations and 3-D underwater imaging accomplished with a number of the latest advancements in sonar technology. Ultimately, the use of leading edge 3-D imaging technology provided the Golden Gate Bridge District with high resolution imagery of the underwater construction and seabed topography to fully document the existing condition and configuration of the submerged bridge elements and surrounding channel bottom. Coupled with the 3-D imaging results was the detailed hands-on inspection and assessment of the submerged bridge construction by engineer-divers to collectively provide the District with a most comprehensive picture of the bridge's current state below the surface of the waters of the Golden Gate Strait.

Demonstration of ODOT Software for Bridge Monitoring & Plans of Action for Scour Critical Bridges

Allan Carter, Oregon Department of Transportation

The purpose of this demonstration is to show how Oregon DOT uses in-house technology to integrate an application for Plans of Action (POA) for Scour Critical Bridges with a Bridge Monitoring system. This system demonstration will demonstrate a software application developed by ODOT that complies with the FHWA Scour Critical Bridge – Plan of Action form and also how it interacts with the Bridge Monitoring system. We will demonstrate that all required fields and more have been incorporated into a software application that integrates with many different data sources to automate what was at one time a very manual process. We will show how the Watchdog real time Bridge monitor refreshes Flow Gage Data, AHPS Forecast Data, AHPS Recaps, Rainfall Data, Rainfall Predictions and NEXRAD Tabular Data. Then we will exhibit how triggers are setup to alert key persons when data from monitoring stations trigger an event. We will show the basic flow of data from the Watchdog Monitor to the preset trigger events to a specific bridge Plan Of Action that will be executed based on that event.

Unknown Bridge Foundations in Oregon: A Multi-Disciplinary Approach

Edward Foltyn, Oregon Department of Transportation

Determining the actual scour susceptibility of bridges with unknown foundations has been a priority of FHWA and the country's Departments of Transportation for the last ten to fifteen years. After the initial flurry of activity, after the Schoharie Bridge collapse in 1987, analyzing bridges for scour throughout the 1990s, engineers across the country



discovered that there were many where the foundations were unknown and therefore could not fully determine the scour susceptibility. Oregon Department of Transportation (ODOT) took the approach of examining old files to determine whatever information available for bridges. We have over 5,600 bridges over water. Through the 1990s, ODOT commissioned scour analyses of 4,000+ of these bridges. In general, these analyses were WSPRO or HEC-RAS analyses based on surveyed cross-sections and designed or record bridge data. Currently ODOT has about 200 remaining bridges with unknown foundations. ODOT has Plans of Action (POAs) for all "Unknown Foundation" bridges and are currently in the process of determining the foundation characteristics for the bridges with higher ADTs. ODOT has contracted with FDH Engineering, Inc. to perform non-destructive testing on our bridges using Dispersive Bending Wave and Parallel Seismic techniques to determine thickness of shallow foundations and the lengths of piles. After testing and analysis by geotechnical and hydraulic engineering, many of these bridges are being forwarded to structural engineers for further analysis. This presentation will discuss the results of that geotechnical/geophysical testing and where Oregon stands with updating scour analyses for the unknown foundations in Pontis.

SESSION 7 INSPECTION REQUIREMENTS / ACCESS

Innovative Access Methods:

Enabling In-depth and Fracture Critical Inspection of the St. Johns Bridge

Thomas Howell, HDR Engineering, Inc.

With no established precedent, numerous access methods and never-before-attempted innovations were used to gain arm's reach access to 100% of the specified bridge components on Portland's historic St Johns suspension bridge. These included the use of hydraulic lifts of various capacities and configurations, structure climbing, confined space entry, industrial rope access, and liberal use of winches and cutting/welding equipment to make on site modifications to the structure. Concepts in field problem solving and out of the box thinking under real-world conditions are presented as they pertain to successful performance of complex bridge inspections.

Oregon's Bridge Fall Arrest Cable Systems

Jeff Swanstrom, Oregon Department of Transportation

Fall arrest cable systems are recommended for bridges where access for inspection and maintenance is not practical using snooper cranes or boom-lifts, and for ladders more than 20 feet tall. Oregon DOT's inventory of fall arrest systems include two dozen "high risk" and "low risk" systems. The risk category is determined by how quickly these systems will degrade, whether they include high-stress details, type of steel, wear-prone details, or factors of safety. This presentation will cover how these fall arrest systems are inspected and maintained through a combination of bridge inspectors and bridge maintenance personnel, by using contracts with the system manufacturer, or hiring a qualified engineering firm.

ODOT Bridge Inspector Certification Program

Richard King, Oregon Department of Transportation

The presentation will cover expectations for persons taking the ODOT Proficiency exam, including what items are looked at, how items are graded, what is needed to pass the exam.

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Skagit River Bridge Collapse and Vertical Clearance Data

George Comstock, Washington State Department of Transportation

This presentation will summarize the cause of the Skagit River Bridge collapse on May 23, 2013 and go into more detail on how this disaster changed all aspects of bridge vertical clearance data collection, review and dissemination to the public. The presentation will end with a demonstration of WSDOT's Bridge Vertical Clearance Trip Planner web application available to the public.

SESSION 8 LOAD RATING

Posting Bridges for Specialized Single-Unit Trucks

Bert Hartman, Oregon Department of Transportation

Specialized Hauling Vehicles (SHVs) are legal vehicles with legal axle weights that meet the Federal Bridge Formula (Formula B) equation for maximum axle group weight and represent short wheel based vehicles with multiple drop axles (such as modern concrete and dump trucks). These vehicles are commonly used in the construction, waste management, bulk cargo and commodities hauling industries. These vehicles consist of moveable axles that raise or lower as needed for weight, and result in higher loads concentrated over shorter distance. These SHV trucks cause force effects in bridges that can exceed the stresses induced by the Type 3, Type 3S2, or Type 3-3 legal vehicles by over 50 percent in certain cases. The shorter bridge spans are most sensitive to the newer SHV axle configurations. This presentation describes the SHV vehicles, and the load rating formula that is used for highway bridges. The load effects of the SHV's are compared to the AASHTO family of three legal loads for several span lengths. While the national effort is focused on single-unit vehicles, there are combination vehicles in Oregon that also need to be accounted for. The presentation concludes with the proposed signs, and the plan to accomplish updating load ratings to include SHV's.

Inventory Inspection and Load Rating of a Historic Vertical Lift Bridge

Matthew Lengyel, David Evans & Associates, Inc.

Bridges are an integral part of our transportation system and history. The average age of a bridge in the United States is 42 years old, but some are much older. The Murray Morgan Bridge over the Foss Waterway in Tacoma, Washington is over 100 years old, making it not only an important transportation link for City, but also making it an important piece of the City's history. This 1,750-foot-long movable bridge features a 221-foot-long main vertical lift span that has had a long service history, but eventually needed to be closed to vehicular traffic in 2007. Then in 2010, the City began a major \$57 million design-build rehabilitation and strengthening project that reopened the bridge in 2013 and anticipates an extended service life of 75 years. This presentation will focus on the inventory inspections and load ratings that were performed as part of the final commissioning activities for the bridge. The special inspection equipment for this type of movable bridge inspection will be discussed, as well as unique inspection elements that are normally not part of typical bridge inspections. The presentation will highlight a number of improvements made to the elements of the bridge, to significantly increase the serviceability and durability of the bridge. Finally it will present some of the final element rating factors and how the Sufficiency Rating of the bridge was improved from a two to well over 80.



Presenter BIOGRAPHIES

Darryl Anderson

darryla@andersonengineering.com

Anderson Engineering and Surveying Inc.

Darryl Anderson has been owner of Anderson Engineering and Surveying for 31 years and has performed bridge inspections for 30 years. His firm inspects approximately 500 local agency bridges every two year inspection cycle. He is a Registered Civil and Geotechnical engineer and Land Surveyor. Darryl received his BS from OIT in 1978.

Douglas Blades

douglas.blades@dot.gov

Federal Highway Administration

Doug Blades joined FHWA in 2001 as an intern in the Office of Bridge Technology working with the bridge inspection program and the National Bridge Inventory. From 2003 to 2005, was the assistant to the Division Bridge Engineer in Oregon. From 2005 to 2008, was the Assistant Division Bridge Engineer in Illinois. In 2008, returned to the Office of Bridge Technology (now Office of Bridges and Structures) to assist in the Highway Bridge Program, Bridge Inspection Program and the National Bridge Inventory. From 2009 to 2011, was a key member in developing the National Bridge Inspection Oversight Program (commonly referred to as the metrics). In 2009, lead the update of NHI's Bridge Inspection Refresher Course and continued to monitor the course content. In 2010, joined the team developing the National Tunnel Inspection Standards (NTIS) and reviewed the development of the inspection chapter of the Tunnel Operations, Maintenance, Inspection and Evaluation (TOMIE) Manual. In 2011, lead the development of a coding guide for tunnels with a contractor. In 2013, lead the development of NHI's Tunnel Safety Inspection Course. Currently leading the development of a Tunnel Oversight Program and a Tunnel Inspection Refresher Course, creation of a National Tunnel Inventory and implementation of the NTIS.

Barry Brecto

Barry.Brecto@dot.gov

Federal Highway Administration

Barry Brecto is the Senior Bridge Safety Engineer in FHWA's headquarters Office of Bridges and Structures serving the western Divisions of the FHWA. He has over 30 years of bridge related experience centered on all aspects of highway transportation structures- design, construction, maintenance and inspection. Work assignments in the States of California, Oregon, Colorado, Utah, Illinois and Washington have given Mr. Brecto an understanding of regional and state capabilities and practices. Over the past four years, Mr. Brecto has provided oversight of the National Bridge Inspection Program and assistance to the Division Offices and State DOTs in the 12 western States. He is also actively involved with delivering National Highway Institute training courses, revising and updating the Bridge Inspectors' Reference Manual, and supporting efforts to develop tunnel inspection standards, as well as providing support to AASHTO's T-18 technical committee. Mr. Brecto earned a Bachelor of Science in Civil Engineering from Washington State University. He is a registered professional engineer in the State of Oregon.

Allan Carter

Allan.CARTER@odot.state.or.us

Oregon Department of Transportation

Allan Carter has held many different executive roles as VP of Operations, CIO, CEO and CFO. Allan Carter has published research papers in the Transportation industry and has collaborated on those research papers with the CIO's of Menlo Worldwide/Con-Way, UTI Worldwide, Penske Logistics and other top transportation companies. Allan Carter has spent his career guiding both public and private companies in the transition and upgrade of technologies by implementing and delivering short and long term technology roadmaps. Allan Carter has taught Computer Science classes and developed new Computer Programming curriculums for the California State College system. As a Senior Systems Analyst and Project Manager at ODOT Allan

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Carter has guided many software technology innovations and upgrades in the areas of Access Management, Right of Way, Safety and Bridge initiatives.

George Comstock

comstog@wsdot.wa.gov

Washington State Department of Transportation

George Comstock has been inspecting bridges for nearly all his career, working for Alpha Engineering and Harding Lawson Associates until 2000. Since then, he has worked in the WSDOT Bridge Preservation Office. Since 2006, he has managed the Information Group within the Preservation Office.

Bryan Duevel

Jacobs Associates

Mr. Duevel has over 15 years of geotechnical and construction engineering experience on a wide breadth of projects including tunnels, dams, bridges, and rail infrastructure. Mr. Duevel has managed geotechnical teams developing designs for large, multi-disciplinary projects through all phases including the development of subsurface exploration programs, detailed design, and support during construction. Mr. Duevel has extensive experience in site characterization, rock and soil slope stability analyses, excavation support systems, deep foundations, seismic and liquefaction assessments, and tunnel condition assessment. Mr. Duevel has been responsible for the development for design reports, construction specifications and final design drawings.

Edward Foltyn

ed.foltyn@odot.state.or.us

Oregon Department of Transportation

Ed Foltyn is the Bridge Hydraulic Engineer for the Bridge Engineering Section of ODOT, since 2012. He is a licensed engineer in Oregon and New Hampshire. Ed has been with ODOT since 2006. Mr. Foltyn received a Bachelor of Science Degree and a Master of Science Degree in Civil Engineering from Clarkson University in Potsdam, New York.

Bert Hartman

bert.h.hartman@odot.state.or.us

Oregon Department of Transportation

Bert Hartman has been with the Oregon DOT for 16 years and is the Bridge Program Unit Managing Engineer. The Bridge Program Unit responsibilities include the Bridge Management System, leading the effort to select bridge replacement and rehabilitation projects, administering the Major Bridge Maintenance Program, load rating, and over dimensional permit review. In his spare time, Bert enjoys swimming and biking. He and his wife Sonia have two grown children.

Joseph Hartmann

Joey.Hartmann@dot.gov

Federal Highway Administration

Dr. Joseph (Joey) Hartmann was appointed to the position of Director, Office of Bridges and Structures, Federal Highway Administration on April 7, 2014. Since January, 2011, Dr. Hartmann had served as a Principal Engineer and the Team Leader of the Structural Engineering Team, Office of Bridges and Structures where he was responsible for the development and implementation of Federal regulations, policy and technical guidance that supported a program to improve safety and design practice at the national level. In addition, he provided leadership in structural engineering aspects of all FHWA programs, and he coordinate those activities with FHWA field offices, other Federal agencies, State Departments of Transportation (DOTs), local agencies, academia and with various other partners and customers. Prior to this assignment, Dr. Hartmann also held other key leadership assignments at FHWA including Team Leader, Bridge and Foundation Engineering Team, and Team Leader, Infrastructure Inspection and Management Team, both in the Office of Infrastructure Research and Development. Dr. Hartmann has also served as a primary structural forensic investigator for the Agency. He has been the FHWA Principle Investigator for several catastrophic failures including the I-35W Bridge collapse in Minneapolis, the I-90 Central Artery Tunnel suspended ceiling collapse in Boston and, more recently,



the I-5 Skagit River Bridge collapse north of Seattle. Since 2005, Dr. Hartmann has been an Affiliate Professor of Civil Engineering at George Mason University. He holds Bachelor of Science, Master of Science and Doctorate Degrees all in Civil Engineering from the University of Maryland.

Rich Hovde

rph@deainc.com

David Evans and Associates, Inc.

Rich currently manages Bridge Operations for David Evans and Associates based in Olympia, Washington. Rich, native to the Pacific Northwest, has worked for the Corps of Engineers, DOD Fort Lewis, WSDOT, and King County Bridge Unit, all based in Washington State. Rich has been inspecting bridges and structures since joining WSDOT in 1990 and is always seeking ways to improve efficiency, accessibility, and documentation while decreasing costs.

Thomas Howell

tom.howell@hdrinc.com

HDR Engineering, Inc.

Tom Howell is a structural engineer and bridge inspector with HDR Engineering, Inc. Tom has 14 years of industry experience primarily concentrating on inspection of large and complex steel structures. Tom is certified to Level 3 by the Society of Professional Rope Access Technicians and leads inspections of structures using climbing techniques throughout North America.

David Johnson

David.K.Johnson@odot.state.or.us

Oregon Department of Transportation

Senior Electrical Design at Oregon Department of Transportation Bridge Preservation Section for last 15 years. Defense Contracting Work Before. Lead Electrical Design Engineer for Major Renovation Projects I-5 Portland-Vancouver Interstate Bridges, Lewis & Clark, New Young's Bay Bridges in Astoria Oregon, and Others

Chris Keegan

keeganc@wsdot.wa.gov

Washington State Department of Transportation

Chris Keegan is a West Point graduate with 36 years of bridge experience from inspection, to design, to construction, and maintenance. Chris currently works as Regional Operations Engineer for WSDOT and is the State Bridge Maintenance Engineer. Chris serves as Chair of the Western Bridge Preservation Partnership and is a Member of both the Federal Highways Bridge Preservation Expert Task Group and the Sub Committee on Maintenance, Bridge Technical Working Group.

Richard King

richard.j.king@odot.state.or.us

Oregon Department of Transportation

No biography provided.

Wilson Lau

Golden Gate Bridge Highway and Transportation District

Wilson Lau, P.E., is the Supervising Civil Engineer of the Golden Gate Bridge. He has over 27 years of experience in the construction, design and inspection of bridges. Mr. Lau is the program manager for the Bridge Inspection of the Golden Gate Bridge Highway and Transportation District.

Matthew Lengyel

mjle@deainc.com

David Evans and Associates, Inc.

Matt Lengyel has experience in inspection, design, construction and load rating of bridges crossings and interchanges across the United States of America. He earned his BSCE from the Citadel and MSCE from Kansas State University, and is currently the Olympia, Washington Bridge Practice Leader at David Evans and Associates, Inc. (DEA). Matt provides bridge engineering services for

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a wide range of assessment, inspection, replacement or rehabilitation design and construction projects. During his career he has worked on nine major bridge projects that had design and construction costs in excess of \$100 million that were constructed using design-build or design-bid-build delivery methods.

Brian Leshko

brian.leshko@hdrinc.com

HDR Engineering, Inc.

Brian J. Leshko is a Vice President, Principal Professional Associate and HDR's Infrastructure Inspection & Asset Management Program Leader based in Pittsburgh, PA. He received his B.S.C.E. from the United States Air Force (USAF) Academy, an M.S. in Structural Engineering from the University of Connecticut, and a Master of Civil Engineering with an emphasis in Structural Dynamics from The Johns Hopkins University. Following his Regular Commissioning in the USAF, Brian served seven years on Active Duty as a Civil Engineering Officer with assignments as a Design and Construction Engineer, Quality Assurance Evaluator, and Instructor of Civil Engineering at the USAF Academy. He has devoted the last 22 years of his career as a bridge engineer. His experience includes NBIS/Pontis, FCM and in depth bridge condition inspections; new and rehabilitation designs; and ratings by working stress and load factor methods. He is an NHI-Certified Bridge Safety Inspector and a former SPRAT-Certified Level I Rope Access Technician with extensive rope access and structure climbing experience inspecting large and complex structures, including: tunnels; water control structures; pipeline structures; and plate girder, box girder, arch, suspension, cable-stayed, segmental concrete and various truss bridges (highway and railroad). Brian has been a Professional Engineer since 1992, and he is currently registered in 16 states.

Christopher Ligozio

chris.ligozio@kpff.com

KPFF Consulting Engineers

Chris is a graduate of the civil engineering program at SUNY Buffalo and currently serves as Senior Structural Engineer with the Chicago Office of KPFF. He has 20 years experience in bridge design and evaluation, with expertise in the inspection, evaluation, and repair of bridges and other infrastructure. He has led service life extending rehab studies for several major river crossings and helped design the first North American stay-cable replacement program. He is a registered professional engineer in New York and Alaska, and a registered structural engineer in Illinois.

Tom Ryan

tryan@mbakerintl.com

Michael Baker International

No biography provided.

Homer Saidi

hsaidi@azdot.gov

Arizona Department of Transportation

Homer Saidi has advanced engineering degrees from various higher education institutions in USA and abroad. He is a registered PE in the State of Arizona. He has about 34 years of experience in the fields of environmental quality, water resources, project management and bridge inspection, all in public sectors of States of Iowa and Arizona. He has been with ADOT since 1989 with 14 years of service in the Bridge Management Section of the Bridge group. He is mainly responsible for review of routine and in-depth inspections by in-house and on-call consultants.



Jamie Schick

schick@jacobssf.com

Jacobs Associates

James Schick is an engineering geologist with over twenty years' experience in the practical application of the geological sciences to both large and small-scale engineering, permitting, and environmental projects for both the public and private sector. He has expertise in detailed site characterizations as well as broad general surveys for projects involving tunnels, dams, transportation, trenchless crossings, pipelines, industrial facilities, and power generation sites. Jamie has extensive experience with unstable rock and soil slope investigations and remediation as well as trenchless technology evaluations and design.

Mohan Sharma

msharma@azdot.gov

Arizona Department of Transportation

Mohan Sharma has a PhD in Bridge Engineering and PE from the State of Arizona. He has over 25 years of experience in bridge design and all types of bridge inspections in Canada, Japan and USA. He has been working at ADOT since 2011 and mainly responsible for bridge inspection as well as database management and inspection scheduling.

Joshua Sletten

jsletten@utah.gov

Utah Department of Transportation

Joshua J. Sletten, S.E. is the Bridge Management Engineer for the UDOT Structures Division; he has served in this capacity for two years. Prior to his current role, Josh also served as the Structures Design Manager and the Structures Division Project Manager for UDOT. Prior to working at UDOT, he spent eight years working as a bridge design engineer and project manager for the transportation engineering consultants LJB, Inc in Dayton, Ohio and HNTB Corp. in Salt Lake City, Utah. He is a member of the AASHTO Subcommittee on Bridges and Structures and serves on the Technical Committee

for Bridge Preservation (T-9) as well as the Technical Committee for Software and Technology (T-19). He earned a bachelor's degree in Civil Engineering from the South Dakota School of Mines and Technology in 2001 and a master's degree in Structural Engineering from Purdue University in 2002.

Scott Snelling

snelling@pbworld.com

Parsons Brinckerhoff

Scott Snelling is a supervising engineer with Parsons Brinckerhoff's movable bridge group. His areas of expertise include movable bridges, heavy machinery, bridges, tunnels, and other facilities. He has experience in design, construction management, inspection, calculation, preparing and checking drawings, construction cost estimating, and preparing technical reports. Mr. Snelling has performed the roles of project manager, project engineer, and task leader. He is a recognized expert in heavy machinery, including several published papers, presentations, and chapters. He is actively involved in civil engineering industry-wide sustainability committees and has been published widely on the subject of applying sustainability rating to the bridge industry.

Derek Soden

derek.soden@dot.gov

Federal Highway Administration

As a member FHWA's Structures Technical Services Team, Derek provides technical assistance, training, and project and program reviews in the areas of bridge inspection, inventory management, design and construction. From 2009 to 2012, Derek was the Assistant Division Bridge Engineer for FHWA's Florida Division, where he was responsible for Federal oversight of the bridge programs of the Florida Department of Transportation and Puerto Rico Highway and Transportation Authority. From 1998 to 2009, Derek was an Engineer in the Bridge Design Section of the Alaska Department of Transportation where he developed designs for new bridges and bridge repair, rehabilitation and seismic

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retrofit projects throughout the State. From 2002 to 2009, he was an inspection team leader performing routine, damage, and initial inspections and providing structural reviews based on inspection findings. Derek received his bachelor's degree in civil engineering in 1997 from the University of Alaska in Fairbanks (where he was born and raised) and his master's degree in structural engineering in 1998 from the University of California, Berkeley.

Daniel Stromberg

dstromberg@collinsengr.com

Collins Engineers, Inc.

Daniel G. Stromberg, P.E., S.E., is the Chief Structural Engineer/Diver at Collins Engineers, Inc. He has over 30 years of experience in the inspection and design of highway and railroad bridges, as well as various waterfront and waterway-related structures. He has managed and conducted over 5,000 underwater inspections of various private and public sector structures worldwide. Mr. Stromberg co-authored the FHWA/NHI manual Underwater Bridge Inspection (2010) and he is also a principle instructor for the manual's accompanying NHI Course 130091, Underwater Bridge Inspection. Mr. Stromberg is a certified ADCI Surface-Supplied Air Diver and an ADCI Surface-Supplied Air Diving Supervisor.

Jeff Swanstrom

Jeff.Swanstrom@odot.state.or.us

Oregon Department of Transportation

Jeff Swanstrom is the Senior Bridge Inspector for the Oregon Department of Transportation's Bridge Operations unit. He has a B.S. in Civil Engineering Technology and an A.E. in Structural Engineering from Oregon Institute of Technology. Jeff is a registered professional engineer in Oregon and has 23 years of experience performing "in-service" inspections of bridges, tunnels, culverts, and sign structures throughout the state of Oregon. Jeff is married and he and his wife Katie have two children, Erik, 24 and Ella, 19.

Mark VanDeRee

vanderee@pbworld.com

Parsons Brinckerhoff

Mark VanDeRee, P.E. is a registered professional electrical engineer with over 37 years of experience. He is licensed to practice in 14 states and provinces providing engineering designs for power distribution, instrumentation and controls, and motor drive systems. Mark is an assistant vice president and senior supervisor for Parsons Brinckerhoff. He attended the University of South Florida in Tampa and is a member of Heavy Movable Structures, Inc. Mark has worked in the movable bridge industry for 20 years and presently manages electrical and mechanical engineering for movable bridges at Parsons Brinckerhoff. He has designed and commissioned electrical and control systems for movable bridges, power plants, wastewater treatment plants, and thermal treatment facilities worldwide. The control system design includes microprocessor and PLC based systems (programmable logic controllers), hardwired relay based systems, and hybrids of both. With Parsons Brinckerhoff, he has completed over 50 movable bridge design and inspection projects, and over 15 tunnel design and inspection projects. Mark has written twelve published technical papers for tunnel and movable bridge electrical and controls systems, including a 2001 article in Better Roads magazine titled "Movable Bridge Inspection Safety," a 2014 article in the PB Network magazine titled "Lessons Learned- Tunnel Systems," and is a contributing author for the "Bridge Engineering Handbook- Superstructure Design, 2nd Edition, Published by CRC Press 2014.

Glenn Washer

washer@missouri.edu

University of Missouri

Glenn Washer is an Associate Professor at the University of Missouri – Columbia (MU). Before joining the University, Dr. Washer was with the Federal Highway Administration (FHWA) at the Turner Fairbank Research Center (TFHRC) where he served as the director of the FHWA



Nondestructive Evaluation (NDE) program. Dr. Washer has expertise in a wide variety of NDE technologies for the condition assessment of highway bridges, including ultrasonics, thermography, ground penetrating radar, radiography and the visual inspection of bridges. He has published more than 100 conference and journal papers on the development of NDE technologies and their application bridge condition assessment. Dr. Washer is an active leader in the technical community, chairing several committees including the Transportation Research Board's (TRB) Committee on Field Testing and Nondestructive Evaluation of Transportation Structures, and past chair of the ASCE committee on Bridge Management, Inspection and Rehabilitation. Dr. Washer received his Ph.D. in Materials Science and Engineering from the Center for Nondestructive Evaluation (CNDE) at the Johns Hopkins University in 2001.

James Wege

wegeja@wsdot.wa.gov

Washington State Department of Transportation

James Wege is a registered Professional Engineer in the State of Washington. He has worked for the WSDOT Bridge Office since 1999, in the Bridge Preservation Office since 2001. The majority of his time has been spent as the Senior Lead Sign Bridge Inspector.



Evaluating the Conference

Your feedback is essential to our ability to continue to provide a quality educational experience at each PNW Bridge Inspectors' Conference. You will be invited to complete an online survey at the end of the conference; please use the following pages as a guide to help record your impressions of the conference, keeping in mind the goals listed below.

THE 2015 CONFERENCE IS INTENDED TO...

- 1 Provide a forum for bridge and tunnel inspectors to share information, innovations, ideas, and best practices
- 2 Provide a means for sharing bridge inspection methods, equipment, and management techniques
- 3 Provide a forum for the continuing education of certified bridge and tunnel inspection team leaders
- 4 Provide a forum for participants to gain a current federal perspective on the implementation requirements of the NBIS and NTIS

COMMENTS

2015 Pacific Northwest
BRIDGE INSPECTORS'
Conference



OVERALL EXPERIENCE

1. Did we meet or exceed the stated goals of the conference?

2. What was your greatest gain from this conference?

3. What could be done to improve the conference next time?

4. Would you be interested in providing a presentation at the 2017 Bridge Inspectors Conference?
(Please provide your name, organization, phone and email address.)

5. Suggestions on a theme for the 2017 Conference?

6. Where should we hold the 2017 Conference? (City? State?)

2015 Pacific Northwest BRIDGE INSPECTORS' Conference

OVERALL EXPERIENCE

7. Do you have any issues in Bridge Inspection that you would like to see addressed and/or solved at the 2017 conference?

8. Let's talk about the food... what did you like? What didn't you like? What do you want to eat at conferences?

9. Given the current economic climate, if we were to host a 2017 conference, would you attend?

- ☐ Yes, for sure ☐ Yes, if budgets allow ☐ No ☐ Other (please specify below)

	EXCELLENT	ABOVE AVERAGE	AVERAGE	BELOW AVERAGE	POOR	DID NOT ATTEND
10. Please rate the following conference administration elements.						
Registration Process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Handout Materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Meeting Facilities & Customer Service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dessert Reception	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Breaks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lunches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Networking Reception	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



TUESDAY

APRIL 7

	EXCELLENT	ABOVE AVERAGE	AVERAGE	BELOW AVERAGE	POOR	DID NOT ATTEND
1. Please rate the following Session 1 Speakers/Presentations.						
Welcome <i>Jeff Swanstrom, ODOT and Tim Rogers, FHWA OR</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Keynote: Yesterday, Today and Tomorrow: Bridges and Tunnels in America <i>Joey Hartmann, FHWA HQ</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23 Metrics: A Current Progress Report <i>Barry Brecto, FHWA HQ</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inspection to Preservation <i>Chris Keegan, WSDOT</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Please rate the following Session 2 Speakers/Presentations.						
AASHTO Bridge Elements Inventorying Issues <i>Derek Soden, FHWA Resource Center</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Adopting Bridge Inspection by Elements, Challenges & Solutions <i>Homer Saidi and Mohan Sharma, ADOT</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
UDOT Transition to Current AASHTO Elements <i>Joshua Sletten, UDOT</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Please rate the following Session 3 Speakers/Presentations.						
Fire Damaged Bridges <i>Darryl Anderson, Anderson Engineering and Surveying, Inc.</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fatigue in Ancillary Highway Structures <i>James Wege, WSDOT</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aerial Drones for Bridge Inspection: Pros & Cons <i>Rich Hovde, David Evans and Associates, Inc.</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Imaging Subsurface Damage in Bridge Decks <i>Glenn Washer, University of Missouri</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2015 Pacific Northwest BRIDGE INSPECTORS' Conference

TUESDAY

APRIL 7

	EXCELLENT	ABOVE AVERAGE	AVERAGE	BELOW AVERAGE	POOR	DID NOT ATTEND
4. Please rate the following Session 4 Speakers/Presentations.						
Proposed Revisions to AASHTO Movable Bridge Inspection, Evaluation, and Maintenance Manual NCHRP Project 14-32 <i>Scott Snelling, Parsons Brinkerhoff</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sitka Harbor and Captain Williams Moore Bridge Stay Cable Inspections <i>Christopher Ligozio, KPFF Consulting Engineers</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Applications of Variable Speed Drives to Bascule Bridges, Avoidance of Damage, and Testing of Dynamic Braking Systems <i>David Johnson, ODOT</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. Comments:

WEDNESDAY

APRIL 8



EXCELLENT	ABOVE AVERAGE	AVERAGE	BELOW AVERAGE	POOR	DID NOT ATTEND
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1. Please rate the following Session 5 Speakers/Presentations.

FHWA Implementation of National Tunnel Inspection Standards

Doug Blades, FHWA HQ

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Tunnel Inspections Demystified: Logistics and Considerations

Jamie Schick and Bryan Duevel, Jacobs Assoc.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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PNW Tunnel Inspections: Twelve Years of Lessons Learned Inspecting Mechanical & Electrical Systems

Mark Vanderee, Parsons Brinkerhoff

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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National Tunnel Safety Inspection Training Course Curriculum Development

Tom Ryan, Michael Baker International and Brian Leshko, HDR Engineering, Inc.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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2. Please rate the following Session 6 Speakers/Presentations.

The Image of an Icon: Underwater Inspection of the Golden Gate Bridge

Daniel Stromberg, Collins Engineers, Inc. and Wilson Lau, Golden Gate Bridge and Transportation District

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Demo of ODOT Software for Bridge Monitoring & Plans of Action for Scour Critical Bridges

Allan Carter, ODOT

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Unknown Bridge Foundations in Oregon: A Multi-Disciplinary Approach

Edward Foltyn, ODOT

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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3. Please rate the following Session 7 Speakers/Presentations.

Innovative Access Methods: Enabling In-depth and Fracture Critical Inspection of the St. Johns Bridge

Thomas Howell, HDR Engineering, Inc.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Oregon's Bridge Fall Arrest Cable Systems

Jeff Swanstrom, ODOT

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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ODOT Bridge Inspector Certification Program

Richard King, ODOT

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Skagit River Bridge Collapse and Vertical Clearance Data

George Comstock, WSDOT

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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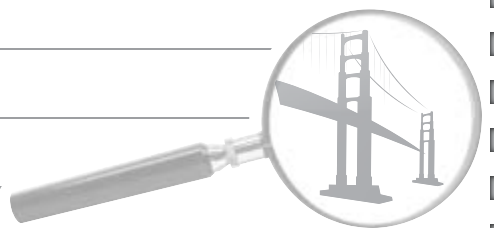
WEDNESDAY

APRIL 8

	EXCELLENT	ABOVE AVERAGE	AVERAGE	BELOW AVERAGE	POOR	DID NOT ATTEND
4. Please rate the following Session 8 Speakers/Presentations.						
Posting Bridges for Specialized Single-Unit Trucks <i>Bert Hartman, ODOT</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inventory Inspection and Load Rating of a Historic Vertical Lift Bridge <i>Matthew Lengyel, David Evans & Associates, Inc.</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Closing Remarks, Most Valuable Presentation Award & Door Prizes <i>Harvey Coffman, WSDOT and Debbie Lehmann, FHWA WA</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

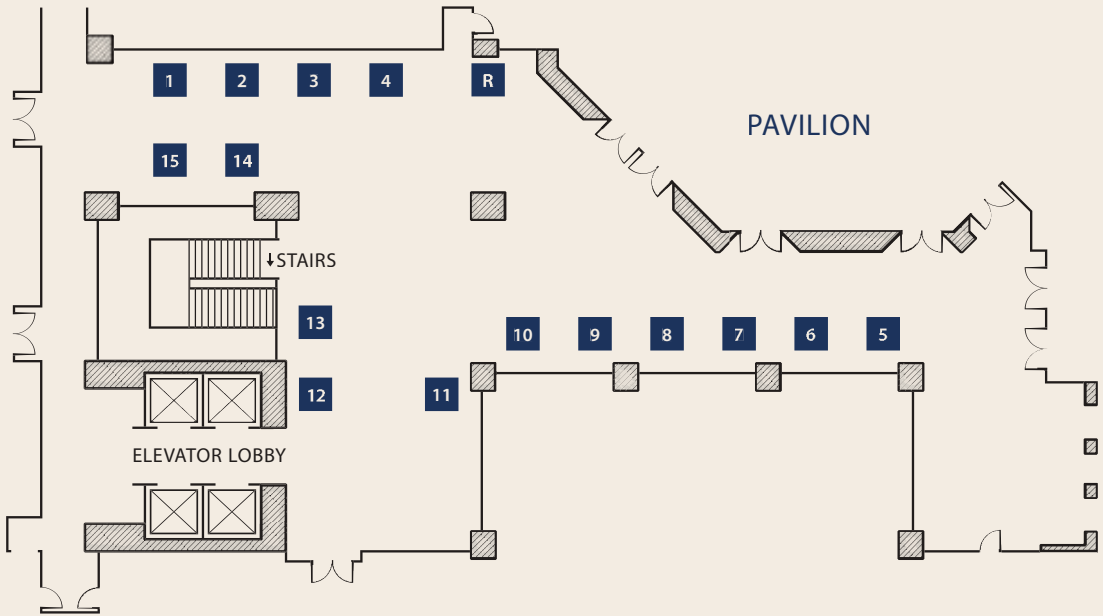
5. Comments:







Conference **EXHIBITORS**



Ambher Monitoring SystemsBOOTH 1
 Ayres AssociatesBOOTH 4
 Bridge Access Specialties.....BOOTH 10
 Burgess & NipleBOOTH 12
 Fish & Associates, Inc.BOOTH 14
 Harcon CorporationBOOTH 7
 Kwik Bond Polymers.....BOOTH 9
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BOOTH 6

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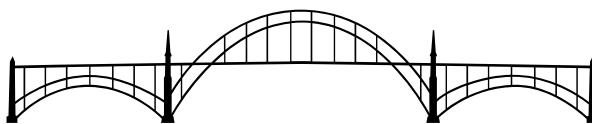


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