NCHRP Project 20-68
U. S. Domestic Scan Program

Prospectus & Status of Programmed Scans — April 13, 2021

Continuing innovation in the practices of U.S. transportation agencies has brought substantial benefits to the nation. Examples of beneficial innovation range from new materials used in pavements and structures, to new ways of collecting and analyzing information about transportation system users and the environment in which the system operates, to new ways of funding the investments needed to improve public safety and efficiency of travel.

Beneficial innovation occurs in any field when new ideas are disseminated and widely adopted by practitioners. Experience in many fields illustrates that expanding the extent of information exchange among practitioners and accelerating the rate of the exchange facilitate innovation.

Experience also shows that personal contact with new ideas and their application is a particularly valuable means for information exchange. U.S. engineering professionals have visited their colleagues in other countries and returned with information that they have subsequently communicated to their domestic colleagues and seen applied to improving domestic practice. The American Association of State Highway and Transportation Officials (AASHTO), the Federal Highway Administration (FHWA), and others have been active in technology transfers at the international level with their involvement in such activities as NCHRP Project 20-36 on "Highway Research and Technology—International Information Sharing."

These experiences have shown that the "scan" approach is a productive means for encouraging the spread of information and innovation. Many international program participants and observers have noted that new ideas are emerging in state and local transportation agencies around the United States, and that faster dissemination of many of these ideas could yield benefits similar to those associated with international information exchange. Domestic scans conducted by various FHWA offices as well as through the NCHRP illustrate the potential value of a domestic scan program.

A scan entails four key steps. First, knowledgeable people identify novel practices in their field of interest. Second, these people assess the likelihood that these new ideas might beneficially be applied in other settings. Third, new practices that offer the most promise are selected and field visits are made to observe the practices, identify pertinent development and application issues, and assess appropriate technology transfer opportunities and methods. Finally, the results of the initial steps are documented for use by those who participated and for others to apply.

Effective scans both supplement and make use of other mechanisms for information exchange such as publications in trade and professional journals, conferences, and peer-to-peer forums. A scan program focuses on face-to-face discussion of current experience, providing opportunities for a uniquely rich exchange of information that is difficult or impossible to replicate through written materials, telephone conversations, and e-mail correspondence. The informal discussions among the group of visitors participating in the scan contribute to the extraction of useful information from the individual members' observations. Executing an effective scan program requires sound understanding of the topic areas to be considered, insightful selection of topics and new ideas to be observed, careful selection of participants who can provide useful insights from their observations, and thoughtful documentation and dissemination of each scan's results. Managing the domestic scan program additionally requires that resources be conserved by not duplicating the information exchange activities of others.

The domestic scan program is broad, considering any innovative practices of high-performing transportation agencies that could be beneficially adopted by other interested agencies. Each scan might span a one- to two-week period and entail visits to two to six sites, possibly geographically dispersed. The program includes annual cycles of topic selection, scans, and documentation.

The purpose of each scan and of the program as a whole is to facilitate information sharing and technology exchange among the states and other transportation agencies and identify actionable items of common interest. While scans have been shown to be an effective means for encouraging innovation, the overall program will include activities to explore alternative methods of identifying emerging new practices and disseminating information about these practices to other practitioners.

NCHRP anticipates the current 3-year schedule of activities (FY 2007-2009) will be the first stage of a continuing domestic scan program. NCHRP staff estimates that funds allocated to the program will typically be

adequate to support planning and execution of three to five scans each year. The number of scans conducted each year will depend on the costs of specific scans and the availability of funds from NCHRP and other sponsorship; the anticipated ranges of total cost of a one-week scan are $80,000 to $100,000 and $110,000 to $150,000 for a two-week scan.

AASHTO and NCHRP identify scan topics, based on suggestions submitted by state DOTs and FHWA; multiple topic proposals may be combined into a single scan. Each scan is planned and conducted with a scan team chair (or co-chairs) and 8 to 10 scan-team members. A subject-matter expert, working with the scan-team chair and members, is responsible for (a) conducting a desk scan; (b) defining the appropriate duration of the scan, its technical structure, and other factors likely to influence planning of the scan; (c) preparing scan technical materials; and (d) preparing a report of the scan. AASHTO and NCHRP identify scan team chairs and members. The scan-program management team receives preliminary scan-topic descriptions from NCHRP; plans, executes and documents scans, including securing NCHRP approvals of interim and final products; and prepares an annual report of the domestic scan program's activities. The management team works with scan-team chairs to select subject-matter experts. The priority and timing of each scan depends generally on availability of supplemental funding and advice of the management team, as well as the panel's priorities and conditions specific to each topic.

Scans on the topics listed below are currently being carried out under the domestic scan program. Included in this prospectus and status report are descriptions of each scan topic, current scan-team participants, and anticipated timing of scan planning and execution.

Scan Title **Page**

NCHRP 20-68 – "US Domestic Scan Program"
Scan 07-01 Best Practices in Project Delivery Management

Description of Scan

The purpose of this scan is to examine programs and practices employed domestically to outsource DOT functions and programs. A related international scan tour was conducted in 1997 and is summarized in "Emerging Models for Delivering Transportation Programs and Services." Since that international scan, State DOTs are under continued pressure to do more with less. Over the last 10 years, FHWA and many State DOTs have seen a significant growth in highway program funding while staffing has either remained constant or been reduced. However, despite the increase in funding, the need and associated costs for rehabilitation/replacement, expansion and maintenance of our highways systems are escalating drastically.

Transportation agencies have developed their own practices of providing the engineering and project management for a broad spectrum of transportation improvement proposals. Project development may be accomplished by using a combination of in-house staff and consultant services. Seldom do the design and other functional unit staff get a clear understanding of how their organizational structure and approach to the design process compares to that of other transportation agencies. Some agencies may have unique approaches to the utilization of in-house staff and consultant resources. By visiting and reporting on a variety of approaches, the observations can be shared and efficiencies identified. Improving the efficiency of how agencies address programs with decreasing staffing levels is timely and essential.

This scan will consider particularly organizational factors (e.g., degree of centralization or decentralization in agency management) that influence agencies' abilities to reliably deliver projects on time and within budget. The states of Washington and Virginia, for example, have been engaged in efforts to redistribute risk among project participants and to otherwise improve flexibility of project teams to respond to evolving conditions. The scan will also include innovative approaches to identifying and evaluating measures of effectiveness for highway projects to supplement the more traditional cost analysis and timeliness statistics.

The scan would review an agency's "division of labor" (who does what) including, but not limited to, the responsibilities of the various functional units of in-house staff and the use of engineering consultants. Typical project development from programming through letting would be explored. The items of interest range from development of project scope and schedule to identifying the human resource requirements to completing the work on schedule. An understanding of the workload and its relationship to resources would be of particular interest. The scan might also compare program size and staff size for similar work from authorization through the project letting stage. Through investigation of lessons learned, this scan tour will facilitate implementation of proven practices while minimizing time and financial resources needed for startup and transition. Specific products from the scan will include a written report; presentations at conferences and other venues; and research statements/projects that will examine specific tools and/or practices in greater depth to assess their applicability in the U.S.

Original Scan Proposal Title(s):

1. 10 Years Later – A Look At The Implementation Of Models For Delivering Transportation Programs And Services
2. Organizing For Efficient Project Development
3. Best Practices Within Top Performers Of Program Delivery
4. Best Management Practices In Environmental Clearances Including Managing Responsive Resource Agencies

Last Reviewed/Revised October 26, 2010

Scan Team Membership

Jim McMinimee, AASHTO Co-Chair
Director of Project Development
Utah Department of Transportation
4501 South 2700 West
Salt Lake City, UT 84119
Office: (801) 965-4022
E-mail: jmcminimee@utah.gov

Gary Mroczka
Director, Production Management Division
Indiana DOT
100 N. Senate Avenue, Room N642
Indianapolis, IN 46204-2216
Office 317-232-5226
Email: gmroczka@indot.in.gov

Mark Lester
Regional Production Engineer
South Carolina DOT
P.O. Box 191 Columbia, SC 29202
Office 803-737-1366
Email: LesterMC@dot.state.sc.us

David Nichols
Director of Program Delivery
Missouri DOT
P.O. Box 270 Jefferson City, MO 65102
Office (573) 751-0760
Email: david.nichols@modot.mo.gov

Joyce N. Taylor
Assistant Director, Bureau of Project Development, Maine DOT
Office: (207) -624-3350
Email: Joyce.Taylor@maine.gov

Sidonia S. Detmer, PMP
Assistant Director
Project Management Office
Virginia DOT
1401 E. Broad St.
Richmond, VA 23219
Office: 804-786-7763
Fax: 804-225-2447
Email:
Sid.Detmer@VDOT.Virginia.gov

Shari Schaftlein, FHWA Co-Chair
FHWA, Team Lead Policy/Program Development
Office of Project Development & Environmental Review
HEPE-20, RM E76-311
1200 New Jersey Ave., SE
Washington, DC 20590
Office 202-366-5570
Fax: 202-366-7660:
E-mail: Shari.Schaftlein@dot.gov

Connie Yew, P.E.
Team Leader
FHWA, Office of Infrastructure
1200 New Jersey Avenue, SE (E73-426)
Washington, DC 20590
Office (202) 366-1078
Fax : (202) 366-3988
E-mail : connie.yew@dot.gov

Alan Teikari, P.E.
Chief, Highway Design Branch
Federal Highway Administration
Eastern Federal Lands Highway Division
21400 Ridgetop Circle
Sterling, VA 20166
Office: 703-404-6296
Email: Alan.Teikari@fhwa.dot.gov

Thomas R. Warne, P.E., SME
Tom Warne and Associates, LLC
9874 S. Spruce Grove Way
S. Jordan, UT 84095
Office 801-302-8300
Fax: 801-302-8301
Email: twarne@tomwarne.com

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	July, 2008
Desk Scan Completed	September, 2008
Pre-scan Meeting Held	September, 2008
Scan Conducted	Feb- Mar, 2009
Draft Summary Report submitted by SME	April, 2009
Draft Report Delivered to NCHRP and Panel	July, 2009
Final Report Delivered to NCHRP	December, 2009

Estimated Scan Cost and Funding

Actual cost and duration: $ 175,500, 1.5 week
Anticipated fund from FHWA: $45,000.

Last Reviewed/Revised October 26, 2010

NCHRP 20-68 – "US Domestic Scan Program"
Scan 07-02 Best Practices in Accelerated Construction Techniques

Description of Scan

The unprecedented increase in traffic volume, coupled with an aging infrastructure, has caused funding levels to jump and highway construction activities to intensify in recent years in an attempt to accommodate the mounting traffic demands. Historically, highway construction time has been extensive, and construction operations have further compounded traffic congestion, particularly in our nation's larger cities. Highway construction is inevitable, but excessive construction time must be avoided. It is costly and causes highway workers to suffer prolonged exposure to traffic and the motorist to substandard conditions.

Using national transportation leaders to identify strategic planning goals, innovative techniques, and newer technologies, the Accelerated Construction Technology Transfer (ACTT) process has proven to be a viable approach to addressing the construction time and traffic congestion concerns of today's large, complex multi-phase projects. As a result, in recent years we have heard a lot about the Accelerated Construction programs that focus on achieving the objective: "Get in, Get out, and Stay out". However, much of the activity occurs preconstruction and it is also well recognized that there are many lessons to be learned during the construction phase of projects about how work can be accelerated even more.

This scan will focus on actual construction operations and management practices rather than contractual or other incentives to develop and apply such practices. Inclusion of construction contractors in discussions at locations visited by the scan team will be essential to achieving insight into these practices. Lessons learned from repair and reconstruction following major disasters – e.g., Hurricane Katrina; the May 2007 truck fire in Oakland, CA – will be considered in scan planning, to the extent that lessons from these fast-track efforts may be transferable to more general usage. The scan's results may influence, for example, construction specifications and procurement procedures to facilitate contractors' adoption of accelerated construction techniques.

Explicit items of interest will include actual construction practices such as the use of prefabricated bridge components, maturity meters for concrete strength, full road closures, innovative pavement products, alternative construction materials and possibly advanced technologies for non-destructive or rapid product testing. Contracts with open-ended methods or those that specify performance for accomplishing project goals and tasks will be sought and reviewed. A main focus of the scan will be to find and examine technologies and approaches to construction that minimize the duration of work zone occupation.

As a result of this scan, the team will compile a broad array of ready to implement technologies, methods and processes that could then be evaluated, catalogued and disseminated to transportation agencies. Specific products from the scan will include a written report; presentations at conferences and other venues; and research statements/projects that will examine specific tools and/or practices in greater depth to assess their applicability in the U.S.

Original Scan Proposal Title: Accelerated Construction Techniques

Last Reviewed/Revised October 26, 2010

Scan Team Membership

Brian Blanchard, AASHTO Co-Chair
Director, Office of Construction
Florida Department of Transportation
605 Suwannee Street, MS 31
Tallahassee, FL 32399
Phone : (850) 414-4140
E-mail : brian.blanchard@dot.state.fl.us

Richard H. Sheffield, PE
Assistant Chief Engineer- Operations
Mississippi DOT
PO Box 1850
Jackson MS 39215-1850
Phone : 601-359-7007
Fax : 601-359-7050
E-mail : rsheffield@mdot.state.ms.us

Thomas Bohuslav
Director of Construction
Texas DOT
125 East 11th Street
Austin TX, 78701
Phone : (512) 416-2559
E-mail : tbohusl@dot.state.tx.us

Steven D. DeWitt, PE
Chief Engineer
North Carolina Turnpike Authority
5400 Glenwood Avenue – Suite 400
Raleigh, North Carolina 27699-1578
Phone: 919-571-3030
Fax: 919-571-3015
E-mail: steve.dewitt@ncturnpike.org

Christopher J. Schneider, FHWA Co-Chair
Construction & System Preservation Engineer
Office of Asset Management (HIAM-20)
Federal Highway Administration
1200 New Jersey Avenue, SE
Washington, DC, 20590
Phone: 202-493-0551
Fax: 202-366-9981
E-mail: 9ehrooz9nts.schneider@dot.gov

George Raymond
Division Engineer, Construction Division
Oklahoma DOT
200 N.E. 21st Street
Oklahoma City, OK 73105
Phone: (405) 521-2561
Email: graymond@odot.org

Dr. Stuart D. Anderson Co-SME
Texas A&M University
Zachry Department of Civil Engineering
Room 115, 3136 TAMU
College Station, Texas 77843-3136
Phone: 979-845-2407
Fax: 979-845-6554
Email: s-anderson5@neo.tamu.edu

Dr. Clifford Schexnayder, P.E., Co-SME
Eminent Scholar, Emeritus
Arizona State University
P.O. Box 6700
Chandler, AZ 85246
Phone : 480-812-0924
E-mail : cliff.s@asu.edu

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	June, 2008
Desk Scan Completed	September, 2008
Prescan Meeting Held	September, 2008
Scan Conducted	March, 2009
Draft Summary Report submitted by SME	April, 2009
Draft Report Delivered to NCHRP and Panel	June, 2009
Final Report Delivered to NCHRP	December, 2009

Estimated Scan Cost and Funding

Actual cost and duration: $ 142,600; 2 weeks
Anticipated fund from FHWA: $25,000.

Last Reviewed/Revised October 26, 2010

NCHRP 20-68 – "US Domestic Scan Program"
Scan 07-03 Best Practices in Winter Maintenance

Description of Scan

Recent history indicates that the field of winter maintenance has advanced significantly in the United States during the past two decades. This advance began at least partly as a result of the Strategic Highway Research Program (SHRP). SHRP began in the mid-1980s, and it featured a number of projects directly related to winter maintenance. From the work of SHRP grew the realization that U.S. technology in the field of winter maintenance lagged behind the technology used overseas. This realization led to two international scanning tours. The first, in 1994, visited Japan and several countries in Europe. The second, in 1998, visited additional European countries. These visits led to a renaissance of technology in the area of winter maintenance in the United States. Two specific areas examined during these international scans included anti-icing strategies; and unique tools, equipment, and techniques for snow removal.

One of the major changes to come from the SHRP studies was the implementation of anti-icing as a strategy for winter maintenance. The typical approach to dealing with snow and ice on the road has been to wait until an event has occurred and then go out and treat the road by plowing and applying de-icing chemicals. This reactive approach often gave rise to road conditions that were less than optimal at the onset of a storm. Snow-melting chemicals had to work on accumulated precipitation before reaching the road surface. New anti-icing strategies require an agency to place chemicals on the road surface just before the start of precipitation. These chemicals prevent the formation of a bond between snow and pavement. Therefore, snow plowing is easier and more effective, and the effects are immediate.

A great deal of new equipment has appeared in the area of winter maintenance during recent years. A major study to investigate the effectiveness of these new pieces of equipment is the Concept Vehicle Project, undertaken by Iowa, Minnesota, and Michigan. Each of the three states built and equipped a truck to test innovative equipment in field conditions. Equipment tested includes friction-measuring devices, Global Positioning System (GPS) locators, engine power boosters, and special chemical application systems. The possibility of knowing where all trucks are at a point in time – as well as where they have been and what they have done – is of enormous value to dispatchers and others who must deal with the public during a storm. It also raises the possibility of being able to adjust winter maintenance activities during a storm in response to data from the field.

This scan will include operating methods, equipment and materials that improve the efficiency and effectiveness of snow and ice control operations, considering local government, as well as State DOT experience. It will include a review of different aspects of snow and ice control and removal methods and procedures by various DOTs. Topics will include: different uses of technology in snow removal activities; avalanche control methods and procedures; different pre-wetting and de-icing methods for bridges and traveled ways; and chain control procedures for safe installation and removal of chains and safe movement of traffic through chain control areas.

Original Scan Proposal Title(s):

1. Winter Maintenance Operations
2. Best Management Practices in Snow and Ice Control

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Scan Team Membership

William H. Hoffman, ASSHTO Co-Chair
Chief Maintenance and Operations Engineer
Nevada Department of Transportation
1263 South Stewart Street
Carson City, NV 89712
Telephone: 775 888-7854 (Direct) or 7050
Fax : 775 888-7211
Email : whoffman@dot.state.nv.us

Michael D. Schwartz
Program Analyst
Virginia Department of Transportation
1401 East Broad Street
Richmond, VA 23219
Telephone: 804 786-0856
Fax: 804 786-0652
Email:
12ehrooz.schwartz@vdot.virginia.gov

Steven M. Lund
State Maintenance Engineer
Minnesota Department of Transportation
Central Office, Transportation Building
Mail Stop 700
395 John Ireland Boulevard
Saint Paul, MN 55155-1899
Telephone: 651 366-3566
Fax: 651 366-3555
Email: steven.lund@dot.state.mn.us

Terry J. Nye, PE
Assistant District Executive Maintenance
Pennsylvania Department of Transportation
Engineering District 1-0
255 Elm Street, P. O. Box 398
Oil City, PA 16301
Phone(s): Office 814-678-7140
Email: tenye@state.pa.us

Benjamin B. McKeever, P.E., FHWA Co-Chair
Program Manager, Traveler Information and
Road Weather Management
ITS Joint Program Office, RITA, USDOT
1200 New Jersey Ave., SE, Washington DC
20590,
Phone: 202-366-4876
Email: ben.mckeever@dot.gov

David Ray
Administrator, Office of Maintenance
Administration
Ohio Department of Transportation
1980 West Broad Street
Columbus, OH 43223
Phone(s): (614) 466-3264/ (614)-644-7105
Email: David.Ray@dot.state.oh.us

Rodney A. Pletan, P.E., SME
7414 West Broadway
Forest Lake, MN 55025
Phone : (651) 464-6636
Mobile : (651) 245-6292
Fax : (651) 464-6636
Email : rodpletan@mywdo.com

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	July, 2008
Desk Scan Completed	October, 2008
Prescan Meeting Held	October, 2008
Scan Conducted	March-April, 2008
Draft Summary Report submitted by SME	June, 2009
Draft Report Delivered to NCHRP and Panel	July, 2009
Final Report Delivered to NCHRP	December, 2009

Estimated Scan Cost and Funding

Actual cost and duration: $ 170,800; 2 weeks
Anticipated fund from FHWA $50,000.

Last Reviewed/Revised October 26, 2010

NCHRP 20-68 – "US Domestic Scan Program"

Scan 07-04 Best Practices in Regional, Multi-Agency Traffic Signal Operations Management

Description of Scan

Sustaining effective traffic signal coordination, both within and across jurisdictional boundaries, has proven to be a daunting task for an increasing number of transportation agencies responsible for the management and operation of traffic signal systems. An increasing number of agencies are realizing that a regional approach to managing and operating traffic signal systems may be a viable alternative to independently sustaining the funding and technical expertise that is essential to effectively managing a traffic signal program. Interestingly the challenges to regional traffic signal operations are typically not technical, but rather institutional.

Cross jurisdictional traffic signal coordination provides substantial benefits to the road user by establishing consistent signal operations across a region, as well as the typical reductions in travel time, stops, and delays. Transportation agencies responsible for the management and operation of traffic signals can also benefit from a regionalized approach to traffic signal management by pooling resources to provide ongoing and sustained staff training, development of signal timing plans, and performance of maintenance activities.

The purpose of this scan is to examine the cooperative agreements, organizational and institutional structures, programs, policies, and operational practices that have enabled agencies to successfully engage in regional traffic signal management programs. This scan will particularly address the interactions of agencies at local, regional, and state levels to ensure effective traffic operations and system maintenance.

Specific objectives of the scan:

- Examine the components of cooperative agreements that foster and enable regional traffic signal coordination and management.
- Examine if, and how, the regionalization of traffic signal coordination reduces travel time, stops, and delays on arterials that traverse multiple jurisdictions.
- Examine how the concept of regional traffic signal management and operations allows resource sharing and consistent operation of traffic signals.
- Examine certification and training needs of operations and maintenance staff involved in the effort.
- Explore the funding mechanisms in place to sustain regional traffic signal operations and how participating agencies contribute to management operations and maintenance expenses.
- Identify technical challenges to overcome and strategies to ensure the effective coordination of traffic signal timing across multiple jurisdictions.

This scan is expected to build a domestic network of knowledge and peer exchange to gain insight on the best practices, organizational structures, technologies, and lessons learned to catalyze the development of regional traffic signal management programs. This domestic scan will provide opportunities for stakeholders to share experience and knowledge in developing regional cooperative agreements, planning, design, implementation, maintenance, and operation of regional traffic signal systems.

Original Scan Proposal Title: Regional Traffic Signal Operations Domestic Scan – Operating Without Boundaries

Last Reviewed/Revised October 26, 2010

Scan Team Membership

Brent Jennings – AASHTO Chair
State Highway Operations and Safety Engineer
Idaho Transportation Department
Office of Highway Safety
3311 W. State Street,
Boise, ID 83707-1129
Office: (208) 334-8557
Phone: (208) 334-8100
Fax: (208) 334-4430
E-mail: Brent.Jennings@itd.idaho.gov

Steve Misgen
Traffic Engineer
Metro District
Minnesota Department of Transportation
1500 West Country Road B2
Roseville, MN 55113
Office: (651) 234-7835
E-mail: steve.misgen@dot.state.mn.us

Jacob B Renick, P.E.
Traffic Signal Engineer
Mississippi Department of Transportation
2567 N. West Street
Jackson, MS 39216
Phone: 601-359-1454
E-mail: jrenick@mdot.state.ms.us
(Mailing: P.O. Box 1850
Jackson, MS 39215-1850)

Yancy Bachmann
Assistant State Traffic Engineer, Field Operations
Georgia Department of Transportation
Office of Traffic Operations
935 East Confederate Avenue,
Building 5
Atlanta, Georgia 30316
Office: 404.635.8129
Fax: 404.624.7116
E-mail: ybachmann@dot.ga.gov

Eddie Curtis
Traffic Management Specialist
FHWA Resource Center
61 Forsyth Street, SW, Suite 17T26
Atlanta, GA 30303
Office: (404) 562-3920
FAX: (404) 562-3700
E-mail: eddie.curtis@fhwa.dot.gov

Vanloan Nguyen, P.E.
Assistant State Traffic Engineer
Traffic Engineering Division
Virginia Department of Transportation
1401 East Broad Street
Richmond, Virginia 23219
Office: (804) 786-2918
E-mail:
Vanloan.Nguyen@VDOT.Virginia.gov

Kevin N. Balke, Ph.D., P.E. -SME
Center Director
TransLink Research Center
Texas Transportation Institute
Texas A&M University System
College Station, TX 77844-3135
Office: (979) 845-9899
Fax: (979) 845-9873
E-mail: k-balke@tamu.edu

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	April, 2009
Chairs and Team Members reconfirmed	March, 2011
Desk Scan Completed	May, 2011
Prescan Meeting Held	May, 2011
Scan Conducted	November, 2011
Draft Summary Report submitted by SME	January, 2012
Draft Report Delivered to NCHRP and Panel	November, 2012
Final Report Delivered to NCHRP	July, 2013

Estimated Scan Cost and Funding

Duration: This scan was conducted as a workshop
Anticipated Fund from FHWA: $ --

Last Reviewed/Revised July 14, 2013

NCHRP 20-68 – "US Domestic Scan Program"
Scan 07-05 Best Practices in Bridge Management Decision-Making

Description of Scan

Bridge maintenance engineers must employ a decision process to convert performance indicators into a prioritized listing of bridge maintenance and repair needs. Modern materials, equipment, innovations in methods, and new applications of familiar products can increase productivity, provide long-lasting repairs, and minimize traffic disruption. Maintenance forces using these enhancements are able to improve the service life of more bridges with the same or fewer resources.

The decision process, however, is critical, as bridge preservation requires timely intervention with effective treatments to address minor deficiencies before significant problems develop. In most states, the bridge maintenance engineer does the process manually with little or no formal guidelines. A decision support system to assist in determining the prioritized list of bridge needs using appropriate performance indicators would assist the engineer in the development of an effective work plan.

This scan will focus on identifying and visiting states that have developed an automated decision support system for bridge maintenance programming. This scan will address how decisions are being made about routine maintenance and major rehabilitations and reconstructions to minimize traffic disruptions and control agency life-cycle costs. Staff to be interviewed would be bridge engineers responsible for developing the bridge maintenance program.

One objective of the scan would be to identify effective decision support systems already in practice, list the benefits and costs of such a system, document the algorithm logic, and identify the performance indicators used by the system. A second objective of the scan would be to provide a compendium of productivity enhancing techniques, applications, and equipment for activities aimed at maintaining and preserving highway structures. Included in the review would be practices and innovations that minimize disruptions to the mobility needs of highway users during the preservation/maintenance operation without comprising the quality of the activity.

The primary target audience would be state and local bridge maintenance engineers, but structural engineers and asset managers would also be interested. Successful systems could serve as a model for a similar system that would be incorporated into state or national bridge management systems, which in turn would lead to a more robust bridge preservation program. The details on innovations and strategies that can be employed by operations forces to ensure high quality results are achieved in the most productive manner would aid state and contractor preservation and maintenance crews, reduce the cost of the activity, and allow for more work to be accomplished with the same resources. The limited preservation and maintenance program dollar would be stretched.

Successful programs could be detailed in a supplemental manual to the AASHTO Maintenance Manual. The supplemental manual would be valuable for bridge maintenance engineers, managers, technicians, and supervising foremen. Managers involved with specifications for bridge preservation and maintenance would also find the manual helpful.

Original Scan Proposal Title:

1. Best Bridge Management Practices
2. Decision Support System for Bridge Maintenance
3. Productivity Enhancements for Bridge Preservation And Maintenance Activities.

Last Reviewed/Revised October 26, 2010

Scan Team Membership

Peter Weykamp, AASHTO Co-Chair
Bridge Maintenance Program Engineer
New York State Department of Transportation
50 Wolf Road, POD 5-1
Albany, New York 12232
Office: 518-457-8485
Fax: 518-457-4203
Cell: 518-935-7470
E-mail: pweykamp@dot.state.ny.us

Bruce V. Johnson
State Bridge Engineer
Oregon DOT
Bridge Engineering Section
355 Capitol St., NE, Room 301
Salem, Oregon 97301
Office: 503-986-3344
E-mail: bruce.v.johnson@odot.state.or.us

Keith Ramsey, P.E.
Director of Field Operations
Bridge Division
Texas Department of Transportation
118 E. Riverside Drive
(Mailing: 125 East 11th Street)
Austin, TX 78701
Office: 512-416-2250
Cell: 512-788-4933
Fax: 512-416-2105
E-mail: kramsey@dot.state.tx.us

Tod Kimball, PE– FHWA Co-Chair
Design and Structures Engineer
FHWA, Vermont Division
87 State Street, P.O. Box 568
Montpelier, VT 05602
Office: 802-828-4574
E-mail: Tod.Kimball@dot.gov

Arthur D'Andrea
Bridge Engineer Administrator
Louisiana Department of Transportation and Development
P.O. Box 94245
Baton Rouge, LA 70804-9245
Phone: 225-379-1319
Cell: 225-505-5455
Fax: 225-379-1786
E-mail: arthurd'andrea@dotd.la.gov

Scot Becker
Development Chief and State Bridge Engineer
Wisconsin Department of Transportation
4802 Sheboygan Avenue
PO Box 7916
Madison, Wisconsin 53717
Office: 608-266-5161
Fax: 608-266-5166
E-mail: scot.becker@dot.state.wi.us

Dr. George Hearn, SME
University of Colorado at Boulder
428 UCB
Boulder, Colorado 80302
Office: 303-492-6381
E-mail: George.Hearn@colorado.edu

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	November, 2008
Desk Scan Completed	January, 2009
Prescan Meeting Held	January, 2009
Scan Conducted	May-June, 2009
Draft Summary Report submitted by SME	July, 2009
Draft Report Delivered to NCHRP and Panel	September, 2009
Final Report Delivered to NCHRP	August, 2010

Estimated Scan Cost and Funding

Actual cost and duration: $ 133,700; 2 week

Last Reviewed/Revised October 26, 2010

NCHRP 20-68 – "US Domestic Scan Program"

Scan 08-01 Best Practices in Managing STIPs, TIPs, and Metropolitan Transportation Plans (MTPs) in Response to Fiscal Constraints

Description of Scan

Nationally, fiscal constraint has proved problematic for many Metropolitan Planning Organizations **(**MPOs) and State DOTs. Since this is an emerging practice, all participants need to feel comfortable and need to be able to explain to the public the process and calculations necessary to provide a true financial picture of long-range transportation plans and short-range Statewide Transportation Improvement Programs (STIPs). This includes the new requirement for using "Year of Expenditure" dollars for TIPs, STIPs, and MTPs and the option of using "Cost Bands and Ranges" for the out years of the MTP, as well as the requirement to demonstrate that the existing transportation system can be adequately operated and maintained.

This scan will consider how state and metropolitan agencies address institutional and technical issues when identifying and applying fiscal constraints to modify their highways system plans.

A specific subject area of great interest that is to be examined by this scan is the inflationary affects on the implementation of transportation projects and the acceptable methodologies of predicting reasonable numbers for available revenues, both in traditional and innovative funding. A cross section of small to large MPOs and State DOTs need to be studied.

Identification of best practices and an understanding of the economic forecasting process necessary to develop accurate financial forecasts will be key to this scan. Innovative and improved methods of demonstrating the effects of fiscal constraints in developing TIPs, STIPs and MTPs will be sought. It is anticipated that findings of this scan will provide valuable ideas for all transportation professionals involved in the estimating of project costs, revenue forecasting, developing financial plans, TIPs, STIPs, and MTPs. It should also prove invaluable for demonstrating statutorily required financial constraint.

Specific benefits expected as a result of this scan are increased accuracy and a public understanding of fiscal constraint and the financial aspects of project development. These benefits will be realized by:

- Ensuring that the cost of transportation projects does not greatly exceed the initial estimate of the implementation costs as identified in the Transportation Plan (TP) or STIP.
- Improving the linkage between revenue forecasting and TP implementation to insure that time consuming major modifications to TPs are needed substantially less often.
- Improving financial constraint analyses through better identification of the affect of inflation on long-term project costs.

Original Scan Proposal Title: Best Management Practices in Developing Fiscal Constraint For STIPS, TIPS, And Metropolitan Transportation Plans

Last Reviewed/Revised October 26, 2010

Scan Team Membership

Timothy A. Henkel, AASHTO Co-Chair
Assistant Commissioner
Modal Planning & Program Management Division
Minnesota DOT
Mail Stop 120, Room 431
395 John Ireland Boulevard
Saint Paul, MN 55155-1899
Phone: (651)366-4829
Fax: (651)366-4795
Email: tim.henkel@dot.state.mn.us

Jeanne Stevens
Long-Range Planning Division
Tennessee DOT
Suite 900, James K. Polk Building
505 Deaderick Street
Nashville, TN 37243-0344
Phone : (615)741-3421
Fax : (615)532-8451
Email : Jeanne.Stevens@state.tn.us

Ben Orsbon
Office of the Secretary
South Dakota Department of Transportation
700 East Broadway Avenue
Pierre, SD 57501
Phone: (605) 773- 3156
Email: ben.orsbon@state.sd.us

Harlan Miller, FHWA Co-Chair
Federal Highway Administration
Office of Planning, Environment, and Realty (HEPP-10)
400 7th Street SW
Washington, DC 20590
Phone: (202) 366-0847
E-Mail: Harlan.Miller@fhwa.dot.gov

Tracy Larkin-Thomason
Assistant Director, Planning
Nevada DOT
1263 South Stewart Street
Carson City, Nevada 89712
Phone: (775)888-7002
Email: tlarkin@dot.state.nv.us

W. David Lee, P.E.
Administrator, Statewide Planning and Policy Analysis
Office of Policy Planning
Florida Department of Transportation
605 Suwannee Street, MS 28
Tallahassee, Florida 32399
Phone : (850) 414-4802
Fax (850) 414-4898
Email : david.lee@dot.state.fl.us

Dr. Thomas W. Clash, SME
146 Mosher Rd.
Delmar, NY 12054
Phone: (518) 439-5904
Cell: (518) 320-5536
Email: Tclash@msn.com

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	December, 2008
Desk Scan Completed	March, 2009
Prescan Meeting Held	March, 2009
Scan Conducted	June, 2009
Draft Summary Report submitted by SME	August, 2009
Draft Report Delivered to NCHRP and Panel	September, 2009
Final Report Delivered to NCHRP	April, 2010

Estimated Scan Cost and Funding

Actual cost and duration: $ 155,900; 2 week
Anticipated fund from FHWA: $25,000

Last Reviewed/Revised October 26, 2010

NCHRP 20-68 – "US Domestic Scan Program"

Scan 08-02 Best Practices in Maximizing Traffic Flow on Existing Highway Facilities

Description of Scan

Nationally, congestion is increasing at a rapid rate. In most cases, building new infrastructure to add capacity is not possible due to lack of funds, unavailability of more right-of-way, or other network constraints. This makes it essential for agencies to maximize traffic flow safely through the nations existing roadway facilities. Innovative strategies need to be implemented by all agencies to make this possible and thus reduce congestion throughout network.

To this end this scan's objectives are:

- Identification of best practices and the conditions under which each is applicable/best suited.
- Improvements in planning/design processes.
- The audience may include traffic engineers, highway designers, ITS operations personnel, and planners.

This scan will consider such techniques as applications of ITS technology, uses of shoulders and lane reversals, and pricing, that may be used to alleviate congestion. More specifically strategies to be found and studied may include but are not limited to such items as:

- Contra flow lanes (lane control signals or moveable barrier systems)
- Reversible lanes
- Real-time traffic management using ITS technologies (ATIS and ATMS)
- Congestion pricing
- Use of shoulders as lanes
- Narrow lanes
- Traffic smoothing strategies such as metering

This scan is expected to capture a body of knowledge that will provide Reduction in delay, crashes, injuries and fatalities by:

- Ensuring that transportation personnel are aware of and have access to a full range of choices for reducing congestion along existing facilities and thus improving safety also.
- Improving the planning/design processes to ensure that certain strategies are always considered before considering infrastructure improvements
- Improving the use of innovative technologies and products as congestion mitigation tools.

It will also provide for development of a domestic network for peer exchange to gain insights on the best practices, organizational structures, technologies and lessons learned to catalyze the development better methods of maximizing the capacity of existing facilities. This domestic scan will provide opportunities for stakeholders to share experience and knowledge in developing regional cooperative agreements, planning, design, implementation, maintenance and operation of existing highway systems.

Original Scan Proposal Title: Best Practices for Maximizing Traffic Flow Through Existing Facilities

Last Reviewed/Revised October 26, 2010

Scan Team Membership

Ted Trepanier, AASHTO Co-Chair
State Traffic Engineer
Washington State DOT
Office: 360-705-7280
E-mail: trepant@wsdot.wa.gov

Gregory Jones, FHWA Co-Chair
FHWA Resource Center
Regional Transportation Operations Specialist
61 Forsyth Street, SW Suite 17T26
Atlanta, GA 30303
Phone : 404-562-3906
Fax : 404-562-3700
E-mail: GregM.Jones@fhwa.dot.gov

Mark Demidovich, P.E.
Assistant State Traffic Engineer
Georgia Department of Transportation
935 East Confederate Ave.
Atlanta, GA 30316
Office: (404) 635-8014
E-mail: mdemidovich@dot.ga.gov

Lee A. Nederveld
Operations Engineer
Michigan Department of Transportation
System Operations and Management
6333 Old Lansing Road
Lansing, MI 48917
Phone: 517-636-0036
Cell: 517-202-0322
Fax: 517-322-3385
E-mail: NederveldL@michigan.gov

Tony S. Abbo, P.E., PTOE
District Three Traffic Engineer
New Mexico DOT
NMDOT-District Three
P.O. Box 91750
Albuquerque, NM 87199-1750
Office : 505-841-2761,
Fax : 505-841-2790
E-mail : tony.abbo@state.nm.us

Mike Pillsbury
Assistant Director of Operations
New Hampshire Department of Transportation
PO Box 483
Concord NH 03302
Phone – 603-271-7419
Email: mpillsbury@dot.state.nh.us

Jeanne Acutanza, P.E., SME
CH2M HILL
1100 112th Avenue NE, Suite 400
Bellevue, WA 98004-4504
PO Box 91500
Bellevue WA 98009-2050
Direct: 425-233-3387
Reception: 425-453-5000
Fax: 425-468-3100
E-mail: Jeanne.acutanza@ch2m.com

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	December, 2009
Desk Scan Completed	February, 2009
Prescan Meeting Held	February, 2009
Scan Conducted	November, 2009
Draft Summary Report submitted by SME	March, 2010
Draft Report Delivered to NCHRP and Panel	September, 2010
Final Report Delivered to NCHRP	April, 2012

Estimated Scan Cost and Funding

Actual cost and duration: $171,000; 2 week
Anticipated fund from FHWA: $ 25,000

Last Reviewed/Revised July 15, 2012

NCHRP 20-68 – "US Domestic Scan Program"

Scan 08-03 Best Practices in Addressing NPDES and Other Water Quality Issues in Highway System Management.

Description of Scan

Non-compliance with NPDES permits can impact project design, engineering and construction schedules and increase construction time and costs. Successful implementation and compliance with NPDES permits requires the appropriate transfer of information and accountability through multiple phases of project delivery. State DOTs that are under NPDES Municipal Separate Storm Sewer System (MS4) Phase I coverage are anticipating implementation of the total maximum daily load (TMDL) process and this poses potential storm water permitting concerns based upon the method of implementation chosen and the types of impairments addressed.

Evidence from discussions at group meetings of state DOT's suggest that many states are having trouble with erosion/sediment control or are reacting to violations stemming from erosion/sediment control problems on their construction projects. As such, it would benefit many DOT's to study this issue and understand what actions can help increase compliance.

This scan will consider the perspectives of both environmental protection and transportation agencies in identifying effective practices for ensuring compliance with regulations and achieving broader objectives. Specifically, this scan will examine items such as:

- TMDL modeling,
- Water quality traditional and innovative best management practices (BMPs)
- Construction techniques and materials being used ,
- Agency maintenance and operations practices
- Coordination with local and federal regulators specifically regarding agreements, processes, and tracking compliance,
- Watershed land use management,
- Water quality credit trading,
- Management options other than structural BMPs (i.e., street sweeping, deicing chemicals, trash removal, nutrient management plans),
- Handling of hazardous spills,
- Agency compliance strategies,
- Funding,
- Program compliance reporting and tracking.

Benefits of this scan would be better insight to the project delivery process, improved compliance with NPDES permits, and reducing project delays associated with NPDES violations and noncompliance. It is anticipated that findings will also result in saving resources as a result of innovative initiatives and improved public image for transportation agencies. The scan will provide an excellent opportunity to document lessons learned and share experiences to assist individual DOTs in negotiating, developing, implementing and tracking TMDL programs as part of NPDES MS4 compliance.

Original Scan Proposal Title:

1. Best Management Practices In NPDES Permit Compliance In Project Delivery
2. Policy, Method, And Mission. Solving Water Quality Compliance Problems At State DOT's
3. Readiness To Face Total Maximum Daily Loads (TMDLs) In National Pollutant Discharge Elimination System (NPDES) Compliance

Last Reviewed/Revised October 26, 2010

Scan Team Membership

Scott McGowen, P.E., AASHTO Co-Chair
Chief Environmental Engineer
Division of Environmental Analysis
California Department of Transportation
1120 N Street
Sacramento, California 95814
Phone: 916-653-4446
E-mail: Scott_McGowen@dot.ca.gov

Brian Smith, FHWA Co-Chair
Biology/Water Quality Specialist
FHWA – Resource Center, Environment
19900 Governors Drive, Suite 301
Olympia Fields, IL 60461
Phone: 708-283-3553
E-mail: brian.smith@fhwa.dot.gov

Scott Taylor – SME
RBF Consulting
5050 Avenida Encinas, Ste. 260
Carlsbad, California 92008
Phone: 760 603 6242
Fax: 760 476 9198
E-mail: staylor@rbf.com

Mark Hemmerlein
Water Quality Program Manager
New Hampshire Department of Transportation
7 Hazen Drive
Concord, NH 03302
Phone: 603-271-1550
E-mail: mhemmerlein@dot.state.nh.us

Vincent W. Davis, P.E.
Stormwater Engineer
Delaware DOT
PO Box 778
Dover, DE 19903
Phone: 302-760-2180
E-mail: vince.davis@state.de.us

Frances Brindle
Natural Resources Unit Manager
Oregon Department of Transportation
355 Capitol Street NE
Salem, OR 97301
Phone: 503-986-3370
E-mail:
Frances.Brindle@odot.state.or.us

Matthew (Matt) S. Lauffer , P.E.
Hydraulic Unit,
Stormwater Management
North Carolina Department of Transportation
Mail: 1590 Mail Service Center
Raleigh, NC 27699-1590
Delivery: 1020 Birch Ridge Dr.
Raleigh, NC 27610
Phone: 919-250-4100
Fax: 919-250-4108
E-mail: mslauffer@ncdot.gov

Patricia A. Cazenas, P.E., L.S.
Highway Engineer
Federal Highway Administration
Office of Project Development & Environmental Review
HEPE-30
1200 New Jersey Avenue, SE
Washington, DC 20590
Phone: 202-366-4085
Fax: 202-366-3409
E-mail: patricia.cazenas@dot.gov

Jeff Lewis
Project Management Engineer – Resource Center
Federal Highway Administration
650 Capitol Mall, Ste 4-100
Sacramento, CA 95814-4708
Phone: (916) 498-5035
Fax: (916) 498-5008
E-mail: jeff.lewis@fhwa.dot.gov

Tom Ripka
Project Review Engineer
Illinois Department of Transportation
Bureau of Construction
2300 S. Dirksen Parkway
Springfield, IL 62764
Phone: (217) 785-4602
E-mail: Thomas.Ripka@Illinois.gov

Rachel Herbert
U.S. EPA
Water Permits Division
Mail Code: 4203M
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460-0001
Phone: 202.564.2649
E-mail: herbert.rachel@epa.gov

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	December, 2008
Desk Scan Completed	April, 2009
Prescan Meeting Held	March, 2009
Scan Conducted	July, 2009
Draft Summary Report submitted by SME	September, 2009
Draft Report Delivered to NCHRP and Panel	October, 2009
Final Report Delivered to NCHRP	April, 2010

Estimated Scan Cost and Funding

Actual cost and duration: $ 139,400; 2 week

Last Reviewed/Revised October 26, 2010

Description of Scan

Effective management of work zone impacts requires appropriate assessment of these impacts. Growing congestion coupled with an increasing need to perform work under traffic present complex challenges to maintaining work zone safety and mobility. Work zones account for an estimated 24% of non-recurring congestion and 10% of overall congestion. Additionally, the number of work zone fatalities has exceeded 1,000 for each of the last 5 years. The recently-updated Work Zone Safety and Mobility Rule requires transportation agencies to use field observations, available work zone crash data, and operational information to manage work zone impacts for specific projects during implementation, and to continually pursue improvement of work zone safety and mobility by analyzing work zone crash and operational data from multiple projects to improve State processes and procedures. Many agencies have little experience in collecting and analyzing work zone performance data beyond crash and fatality reporting.

This scan will address traffic monitoring and management practices in and around work zones to ensure safety and minimize congestion**.** Specifically, this scan will examine processes and methods used to assess impacts during various stages of project development and look at such items as:

- Data sources/availability
- Regional impact considerations
- Tool selection
- Tool calibration
- Project selection
- People involved
- How results are used
- Benefits
- Costs

The scan would address current practices in work zone performance measurement – what safety and congestion/operational performance measures States are using; how they are collecting the data for the measures; and how they are using the data to make improvements in work zone performance and management. The scan would address the role of technology and cover both high-tech and low-tech monitoring methods.

The scan will examine and lead to the sharing of information on what some States have done to develop work zone performance measures, collect data to track measures, and use that data to make improvements to processes, specifications, and practices used for work zone planning, design, and construction. The primary benefactors would be State DOTs, with others including contractors, consultants, and municipalities also benefiting from the scan's findings. It is anticipated that these findings would include Identification of best practices., case studies of approaches and results, including documentation of benefits and lessons learned. Ultimately this will help lead to improvements in mobility, safety, customer satisfaction, and possibly durability through improved construction practices and materials which also translate into a longer duration before the next work zone needs to be established.

Original Scan Proposal Title:

1. Best Practices In Assessing Work Zone Impacts.
2. Work Zone Data and Performance Measurement Practices

Last Reviewed/Revised October 26, 2010

Scan Team Membership

J. Stuart Bourne, P.E. – AASHTO Co-Chair
State Work Zone Traffic Engineer
North Carolina Department of Transportation
1592 Mail Service Center
Raleigh, North Carolina 27699-1592
Office: 919-250-4159 Ext.203
Fax: 919-250-4195
E-mail: sbourne@dot.state.nc.us

Diana Gomez, P.E., PMP
Chief, Office of System Management
Caltrans Headquarters
1120 N St.
Sacramento, CA 95814
Office: 916-651-1255
E-mail: diana_gomez@dot.ca.gov

Brian Zimmerman
Work Zone Technical Administrator
Michigan Department of Transportation
6333 Lansing Rd
Lansing Michigan 48917
Office: 517-242-7366
E-mail: ZimmermanB@michigan.gov

Tracy A. Scriba
Work Zone Technical Program Manager
Office of Transportation Operations
Federal Highway Administration
1200 New Jersey Ave. S.E.
Washington District of Columbia 20590
Office: (202) 366-0855
Fax: (202) 366-3225
Email: tracy.scriba@dot.gov

Ronald D. Lipps
Assistant Director of Traffic & Safety
Maryland Department of Transportation
SHA/Office of Traffic and Safety
7491 Connelley Drive
Hanover, Maryland 21076
Office: 410-787-4017 / 301-624-8242
Fax: 410-787-5823
E-mail: rlipps@sha.state.md.us

Chung Eng – FHWA Co-Chair
Work Zone Operations Team Leader
Office of Transportation Operations
Federal Highway Administration
1200 New Jersey Ave. S.E.
Washington District of Columbia 20590
Office: (202) 366-8043
Fax: (202) 366-8712
E-mail: chung.eng@dot.gov

Denise L. Markow, P.E.
Director of Transportation Management Center
New Hampshire Department of Transportation
Bureau of Traffic – TMC
P.O. Box 483, Route 106
Concord, N.H. 03302-0483
Office: (603) 271-6862
E-mail: Dmarkow@dot.state.nh.us

K.C. Matthews, P.E.
HQ Safety and Traffic Engineering
Traffic Specs & Standards Engineer
Colorado Department of Transportation
4201 E. Arkansas Ave, 3rd Floor
Denver, CO 80222
303.757.9543 Phone
303.757.9219 Fax
E-mail: k.c.matthews@dot.state.co.us

David L. Holstein, P.E.
State Traffic Engineer
Ohio Department of Transportation
Administrator, Office of Traffic Engineering
1980 West Broad Street, 3rd Floor
Columbus, Ohio 43223
Office: 614-644-8137
Fax: 614-644-8199
E-mail: David.Holstein@dot.state.oh

Reynaldo Stargell
Transportation Engineer
Ohio Department of Transportation
Office of Traffic Engineering
1980 W. Broad Street
Columbus, OH 43223
Office: 614-644-8177
Reynaldo.Stargell@dot.state.oh.us

Gerald L. Ullman, Ph.D., P.E.-SME
Senior Research Engineer,
Program Manager
Work Zone and DMS Program – CE/TTI,
Room 410A,
Texas Transportation Institute
The Texas A&M University System
3135 TAMU
College Station, TX 77843-3135
Phone: (979) 845-9908
Fax: (979) 845-6006
Email: geraldullman@verizon.net

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	June, 2009
Desk Scan Completed	November, 2009
Prescan Meeting Held	November, 2009
Scan Conducted	March, 2010
Draft Summary Report submitted by SME	April, 2010
Draft Report Delivered to NCHRP and Panel	July, 2010
Final Report Delivered to NCHRP	March, 2011

Estimated Scan Cost and Funding

Actual cost and duration: $ 201,300 2 week
Anticipated fund from FHWA: $ 50,000

Last Reviewed/Revised July 20, 2010

NCHRP 20-68 – US Domestic Scan Program
Scan 09-01 Best Practices in QC/QA of Design Plans

Topic Description

A scan of Quality Control/Quality Assurance (QC/QA) practices and procedures was proposed to identify methods, techniques, and approaches to improving and maintaining a high quality of designs being prepared by consulting engineering firms. Although many QC/QA programs exist within the U.S., there is significant interest in exploring the most effective of these to identify successful quality control/quality assurance practices that can be readily incorporated by other agencies to assure the highest quality that can be achieved is achieved in design of the nations highway and bridge projects.

Improved design quality will result in shorter project delivery time frames and a reduction in design errors that could lead to serious cost and safety implications. Examples of work items of concern include preliminary highway design, final highway design, environmental clearance/compliance, bridge details, design calculations and final bridge plans. Furthermore, in order to deliver a larger capital programs, some states are using innovative project delivery methods (such as peer reviews, limited reviews, owner's perspective reviews, design build, etc.). The implications of these methods on design quality are uncertain and should be examined.

This scan will examine the policies and procedures used by various states to ensure high quality highway and bridge designs. The scan will investigate Quality Assurance (QA) and Quality Control (QC) processes used to develop highway and bridge designs. A full range of project types will be examined, from major capacity adding highway projects and signature bridge designs to simple betterment projects or bridge rehabilitation projects, to determine the appropriate method and intensity of review across the spectrum.

The scanning team will visit both DOT's that use consultants to develop highway and bridge designs, other DOT's that perform the designs in-house. The scan should identify best practices for QA, QC, Standard Operating Procedures to insure Quality, and Performance Measures used to monitor effectiveness of quality plans. Of specific interest is determining the key components of quality control plans agencies have in place.

All engineering professionals involved with highway and bridge design will benefit from this scan, whether they are the bridge owner or a consultant preparing bridge designs. Good QC/QA of highway and bridge projects provide for Improved Service Life, Improved Safety and Reduction in Construction and Maintenance Costs and the best possible product for the public.

Original Scan Proposal Title

1. Quality of Consultant Designs
2. Quality of Bridge Designs

Last Reviewed/Revised October 26, 2010

Scan Team Membership

Hossein Ghara, P.E. – *AASHTO Chair*
Bridge Design Administrator,
Louisiana Department of Transportation
P.O. Box 94245
Baton Rouge, LA 70804-9245
T: (225) 379-1302
F: (225) 379-1786
E-mail: Hossein.Ghara@la.gov

Nancy Boyd
Deputy State Design Engineer
Washington State Department of Transportation
P.O. Box 47329
Olympia, WA 98504-7329
T: (360) 705-7233
F: (360) 705-6818
E-mail: boydn@wsdot.wa.gov

Tim Swanson
Design Support Engineer
Office of Technical Support
Minnesota Department of Transportation
395 John Ireland Blvd.
St. Paul, MN 55155
MS 692
T: (651) 366-4689
F: (651) 366-4680
E-mail: tim.swanson@state.mn.us

Carmen Swanwick
Chief Structures Engineer
Utah Department of Transportation
4501 South 2700 W
P.O. Box 148470
Salt Lake City, UT 84119
T: (801) 965-4981
F: (801) 965-4187
E-mail: Cswanwick@utah.gov

Robert J. Healy
Deputy Director, Office of Structures
Maryland Department of Transportation
State Highway Administration
707 N. Calvert Street, MS C-203
Baltimore, MD 21202-3601
T: (410) 545-8063
F: (410) 209-5002
E-mail: rhealy@sha.state.md.us

Robert S. Watral, PE
Sr. Bridge Engineer
Pennsylvania Department of Transportation
Bureau of Design
Bridge Quality Assurance Division
400 North Street, 7th Floor
Harrisburg, PA 17120-0094
Phone: 717.346.5974
Email: rwatral@state.pa.us

Richard W. Dunne
Structural Engineering and Deputy State Transportation Engineer
New Jersey DOT
P.O Box 600
Trenton, NJ 08625-0600
T: 609-530-2557
F: 609-530-5777
E-mail: Richard.Dunne@dot.state.nj.us

Kelley C. Rehm, PE – SME
602 Idlewood Dr
Mount Juliet, TN 37122
T: (859) 433-9623
Email: krehm6@hotmail.com

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	June, 2010
Desk Scan Completed	August, 2010
Prescan Meeting Held	August, 2010
Scan Conducted	October-December, 2010
Draft Summary Report submitted by SME	January, 2011
Draft Report Delivered to NCHRP and Panel	March, 2011
Final Report Delivered to NCHRP	December, 2011

Estimated Scan Cost and Funding

Actual cost and duration: $175,000; 2 week

Last Reviewed/Revised April 10, 2012

Topic Description

The process for development of transportation investment projects typically progresses from initial planning through several well-defined stages until the new facilities are opened for the public's use. Measured, deliberate and generally spanning several years, the process has evolved to respond to a range of administrative and regulatory requirements as well as to ensure appropriate care in the expenditure of public funds.

Sometimes there are demands that the process be substantially accelerated to meet short-term objectives. The prospect of hosting the Olympic Games or another globally significant event may spur such acceleration for transportation system improvements throughout the host metropolitan region. Passage of new legislation or changes in political leadership may shift priorities and effectively accelerate certain types of projects in a state. Most recently, the federal government's efforts to stimulate a lagging economy—in particular, enactment of the American Recovery and Reinvestment Act of 2009—raise the prospect of rapid acceleration of project development in many states.

Faced with such demands, responsible state and local agencies typically will work to advance selected projects much more quickly than usual while ensuring that normally expected standards of quality and care are maintained. This scan will undertake to observe how agencies select projects to be accelerated, how they deploy their personnel and other resources in developing these projects, and how they resolve the tensions and conflicts among accelerating activities and between accelerated activities overall and other components of the agency's normal business. These observations offer valuable lessons not only for best practices for agencies faced with demands for sudden acceleration of project development but also for more efficient program management in less stressful times.

Scan-activity type: Reverse scan or web technology envisioned.

Original Scan Proposal Title: N/A (This topic was defined by the NCHRP 20-68 project panel at their meeting held December 10, 2008.)

Last Revised February 18, 2009

Scan Team Membership

(To Be Determined)

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	Deferred**
Desk Scan Completed	Deferred**
Prescan Meeting Held	Deferred**
Scan Conducted	Deferred**
Draft Summary Report submitted by SME	Deferred**
Draft Report Delivered to NCHRP and Panel	Deferred**
Final Report Delivered to NCHRP	Deferred**

****This project has been identified to be dropped**

Estimated Scan Cost and Funding

Estimated cost and duration: $ 0; 0 week

Last Reviewed/Revised October 26, 2010

Topic Description

Following the publication of NCHRP Report 500, Volume 6: "A Guide for Addressing Run-Off-Road Collisions" in 2003, many DOTs have identified Lane Departure as an action area in their state's Strategic Highway Safety Plan. In April 2008, AASHTO published the document "Driving Down Lane-Departure Crashes – A National Priority" which highlighted a number of lane departure remedies. These remedies emphasize the need to more actively address the causes of lane-departure crashes and to develop/implement countermeasures to reduce them. Many crashes are caused by excessive speeds along high-speed rural highways (other than freeways), where drivers often fail to recognize risks inherent in these types of facilities. An important circumstance is where the facility intersects a major at-grade highway or on the approach to or as it passes through towns and other built-up areas or transition areas. A number of states have implemented measures, but their nature and effectiveness are not broadly known. A scan of states which have implemented lane departure strategies either system wide or at spot locations to review the impact of these strategies in crash reduction, implementation costs and the impact on road users would benefit all road agencies in addressing lane departure issues.

This Scan will visit traffic engineering and/or highway design agencies in states where innovative traffic calming/speed reducing measures have been deployed. The Scan will provide information on the various techniques that are successful in lowering vehicle speeds on high speed non-freeway highways at or approaching locations and situations where lower speeds are critical to safety.

Specific items of interest include:

- Identification of lane departure crash locations (site specific vs. system wide)
- Identification of lane departure strategies
- Identification of best practices and the conditions under which each is applicable.
- How are lane departure strategies being implemented
- Are these strategies having other effects on the facility?
- Improvements in new design processes, to reduce highway departure accidents
- Context sensitive design considerations in lane departure projects.

Information obtained from this scan will provide state and local engineering agencies with information on successful strategies employed by others in addressing lane departure safety issues. This information will be particularly important to those who have responsibility for highway safety on high speed highways and greatly assist in reducing highway fatalities associated with these types of crashes.

Original Scan Proposal Title

1. Calming Expressways and Other Major High-Speed Rural Roads
2. Context Sensitive Design Solutions for Lane Departure Strategies

Last Reviewed/Revised October 26, 2010

Scan Team Membership

Mark Nelson – AASHTO Chair
Safety Division Director
North Dakota DOT
608 East Boulevard Avenue
Bismarck, ND 58505-0700
Phone: 701-328-4559 (O)
E-mail: mnelson@nd.gov

John P. Miller
Traffic Safety Engineer
Missouri Department of Transportation
PO Box 270
Jefferson City, MO 65102
Office: 573-526-1759
Fax: 573-526-0120
E-mail: John.P.Miller@modot.mo.gov

Ina Zisman
Traffic Engineer, Region 4
Colorado Department of Transportation
1420 2nd street
Greely, CO 80631
Office: (970) 397-3579
Email: Ina.zisman@dot.state.co.us

Cassandra Isackson
Assistant State Traffic Engineer,
Office of Policy, Safety and Strategic Initiatives Division
Minnesota DOT
1500 West County Road B-2,
Roseville MN 55113,
Telephone No. 651-234-7010
E-mail Cassandra.isackson@state.mn.us.

Daniel Helms
Assistant Safety Engineer
Mississippi Department of Transportation
P.O. Box 1850
Jackson, MS 39215-1850
Phone: 601-359-1454
E-mail: dhelms@mdot.state.ms.us

Richard B. (Dick) Albin, P.E.
Safety Engineer
Federal Highway Administration
Resource Center Safety and Design Technical Services Team
12300 West Dakota Avenue, Suite 340
Lakewood, CO 80228
Office: 303-550-8804
E-mail: dick.albin@dot.gov

Dean A. Focke, P.E.
– *Subject Matter Expert (SME)*
Ohio DOT Retiree
5441 Haverhill Drive
Dublin, Ohio 43017
T: (614) 761-1074
E-mail: dfocke@wowway.com

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	May, 2010
Desk Scan Completed	August, 2010
Prescan Meeting Held	August, 2010
Scan Conducted	November-December, 2010
Draft Summary Report submitted by SME	January, 2011
Draft Report Delivered to NCHRP and Panel	March, 2011
Final Report Delivered to NCHRP	February, 2013

Estimated Scan Cost and Funding

Actual Cost and Duration: $170,000; 2 week

Last Reviewed/Revised March 14, 2013

Topic Description

As of 2007, motorcycles account for 13% (5154) of all traffic fatalities in the United States; a number which has increased for 10 consecutive years. Further, many people are switching to motorcycles as a primary method of travel as motorcycles provide a much more economical means of transportation. Statistics show that motorcycle occupants are 34 times more likely to die in a vehicle accident than passenger car occupants. With a potential increase in motorcycle ridership/ownership and the high probability of fatalities among their riders, the fatality numbers may continue to increase, unless corrective actions (both infrastructure and behavior- related) are taken now. Reducing motorcycle fatalities requires a comprehensive approach which includes behavioral and infrastructure-related strategies. To date, most State-based initiatives in motorcycle safety have focused on behavioral issues such as training, raising awareness of motorcycles among other drivers, and licensing requirements. While infrastructure-related efforts have been limited due to various factors some States have implemented efforts to engage motorcycle riders and organizations to get feedback on roadway-related issues.

This scan will determine the successful infrastructure and behavior- related countermeasures that are being implemented nationwide in order to develop best practices for the country. Several examples of known State-based programs are as follows:

- North Carolina – BikeSafeNC
- Wisconsin's Green Yellow Red (GYR) program,
- Minnesota -Motorcycle Safety Center, or MMSC
- Team Oregon

Additional examples will be sought, especially those which reflect infrastructure-oriented efforts, as part of the scan planning process.

The following issues will be investigated:

- Motorcycle crash causation issues
- Successful infrastructure solutions (barriers, safety edge, work zone enhancements)
- Motorcycle policies and design practices focusing on the infrastructure,
- Successful behavioral programs (training, shadowing/mentoring).

This information will be of value to state DOTs and other operating agencies as well as their designers and operators It is anticipated that the scan will result in the development of a summary that documents successful infrastructure and behavior related solutions addressing motorcycle safety further resulting in expanded adoption and implementation of these solutions by additional States and other operating entities, resulting in less motorcycle fatalities and injuries.

Original Scan Proposal Title: Successful Strategies for Motorcycle Safety

Last Reviewed/Revised October 26, 2010

Scan Team Membership

Dennis W. Heuer P.E. – AASHTO Co-Chair
Administrator, Hampton Roads District
Virginia Department of Transportation
(VDOT)
1700 N. Main Street
Suffolk, VA 23434
Phone: (757) 925-2511
Fax: (757) 925-1618
E-mail: dennis.heuer@vdot.virginia.gov

Dick Schaffer, AICP – FHWA Co-Chair
Office of Safety Integration
Room E73-419
1200 New Jersey Ave SE
Washington, DC 20590
Phone: (202) 366-2176
Fax: (202) 366-3222
E-mail: dick.schaffer@dot.gov

Frances D. Bents – SME
Senior Project Director
Westat
1600 Research Boulevard, RW3535
Rockville, Maryland 20850
Phone: (240) 314-7557
Fax: (301) 610-5128
E-mail: FranBents@westat.com

Joe Foglietta, P.E.
Director of Regional Affairs
New York State Department of Transportation
50 Wolf Road, Executive Suite
Albany, NY 12232-2633
Phone: (518) 457-2470
Direct: (518) 457-9251
E-mail: Jfoglietta@dot.state.ny.us

Pradeep Tiwari, P.E., PTOE
Assistant Director, Roadway Inventory
Multimodal Planning Division
Arizona Department of Transportation
1324 North 22nd Ave, Mail Drop 070R
Phoenix, AZ 85009
Phone: (602) 712-8589
Fax: (602) 252-8313
Email: Ptiwari@azdot.gov

Major Daniel W. Lonsdorf
Director, Bureau of Transportation Safety
Wisconsin State Patrol, WisDOT
4802 Sheboygan Avenue, Room 551
Madison, Wisconsin 53707
Office: (608) 266-3048
E-mail: 41ehroo.lonsdorf@dot.wi.gov

Michael Jordan
Manager, Motorcycle Safety Programs
National Highway Traffic Safety
Administration (NHTSA)
1200 New Jersey Ave, SE
Washington, DC 20590
Phone: 202-366-0521
Fax: 202- 366- 7721
Email: michael.jordan@dot.gov

David Wieder
Maintenance and Operations Branch Manager
Colorado DOT
Maintenance & Operation Branch
15285 S. Golden Road, Building 45,
Golden, CO 80401
Phone: (303) 512-5502
E-mail: David.Wieder@dot.state.co.us

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	June, 2010
Desk Scan Completed	August, 2010
Prescan Meeting Held	October, 2010
Scan Conducted	March-April, 2011
Draft Summary Report submitted by SME	May,2011
Draft Report Delivered to NCHRP and Panel	July,2011
Final Report Delivered to NCHRP	March,2012

Estimated Scan Cost and Funding

Duration: $159,000; 1.5 weeks – this scan was conducted as a reverse scan format
Anticipated fund from FHWA: $45,000

Last Reviewed/Revised March 14, 2012

Topic Description

While codes and regulations governing design, construction, operation and maintenance of most other highway facility components have been promulgated by American Association of State Highway and Transportation Officials (AASHTO) and the Federal Highway Administration (FHWA) to date this has not been the case for tunnels. Recent events has brought considerable attention to this fact and the need to develop national standards for roadway tunnels has recently been recommended by the National Transportation Safety Board (NTSB), following the ceiling collapse of the Central Artery Tunnel in Boston Massachusetts. One of the recommendations is that the Federal Highway Administration (FHWA) in cooperation with the American Association of State Highway and Transportation Officials (AASHTO), develop specific design, construction, and inspection guidance for various tunnel systems. AASHTO recognizes the benefits of extending the focus on tunnels to include various tunnel attributes that improve the safety and security of roadway Tunnels.
This domestic scan would facilitate the development of national standards and provide data for consideration in the development of a national inventory of tunnels. It will also provide valuable information for use by the AASHTO Subcommittee on Bridges and Structures Technical Committee on Tunnels (T-20) and FHWA to use in developing best practices for roadway tunnel design, construction, and maintenance of existing and new tunnels. This scan will include investigation of tunnels on the state highway system as well as those carrying local streets and roads. The scan will focus on tunnel inspection practices, safety (emergency response capability), and design and construction standards practiced by state DOT's and local agencies. Consideration will be given to fire suppression, traffic management, incident detection, maintenance and safety inspection, incident management, and security features in place. The scan will also include forensic inspection, analysis, design, and construction repairs with respect to existing tunnels.

The scan will focus on state DOTs and agencies, with significant tunnels in their inventory. The domestic scan will provide information from tunnel owner/operators within the US to augment information already identified in the 2005 Scan of Underground Transportation Systems in Europe. That scan considered tunnel operations, incident detection, response and recovery planning by various tunnel owner/operators in the European Union. One of the objectives will be to identify specialized technology and standards (such as NFPA 502 standards, and others) used in monitoring or inspecting structural elements and operating equipment to ensure optimal performance and minimize downtime during maintenance or rehabilitation.

The scan findings will be essential in developing a national tunnel inventory of design, construction, maintenance and emergency response practices. The scan findings will be published and made available for AASHTO and FHWA consideration in advancing tunnel guidance and standards. The scan will also facilitate the development of AASHTO guidance and standards for roadway tunnels in the United States. With a national inventory on tunnels, and better information on existing tunnel attributes, US transportation agencies will be in a better positioned to identify tunnel infrastructure needs with respect to safety and security.

Original Scan Proposal Title : Best Practices for roadway tunnel design, construction and maintenance of tunnels on the national, state and local highway systems in the United States.

Last Reviewed/Revised October 26, 2010

Scan Team Membership

Kevin Thompson, AASHTO Chair
State Bridge Engineer
California DOT
Div. Engineering Services, Structure Design
P.O.Box 168041
1801 30th Street
Sacramento, CA 95816-8041
Phone : (916) 227-8807
Fax : (916) 227-8149
E-mail: Kevin.Thompson@dot.ca.gov

Jesus M. Rohena, FHWA Chair
Senior Tunnel Engineer
FHWA Office of Bridge Technology
HIBT-10, Room 3203
400 Seventh Street, SW.
Washington, DC 20590
Phone: (202) 366-4593
Fax: (202) 366-3077
E-mail: jesus.rohena@fhwa.dot.gov

Michael G. Salamon
Tunnel Superintendent
Colorado DOT
4201 East Arkansas Ave
Denver, CO 80222-3406
Phone: (303) 512-5731
Fax: (303) 512-5799
E-mail: Michael.salamon@dot.state.co.us

Alexander K. Bardow
Director of Bridge and Structures
Massachusetts Highway Department
10 Park Plaza, Suite 6430
BOSTON, MA 02116-3973
Office : (617) 973-7571
Fax : (617) 973-7554
E-mail: Alexander.bardow@mhd.state.ma.us

Louis Ruzzi
District Bridge Engineer for Engineering
District 11-0(Pittsburgh Area)
Pennsylvania DOT
45 Thomas Run Road
Bridgeville, PA 15017
Phone : (412) 429-4893
Fax : (412) 429-5085
E-mail: lruzzi@state.pa.us

Bijan Khaleghi
State Bridge Design Engineer
Washington State DOT
Bridge & Structures Office
P.O.Box 47340
Olympia, WA 98504-7340
Phone (360) 705-7181
E-mail: khalegb@wsdot.wa.gov

Barry B Brecto, P.E.
Division Bridge Engineer
FHWA Washington State Division
711 S. Capitol Way, Suite 501,
Olympia, WA 98501
Ph: 360-753-9482
Fax: 360-753-9889
E-mail: Barry.Brecto@dot.gov

Fulvio Tonon, Ph.D., P.E. (TX; Italy, EU)
Assistant Professor
The University of Texas at Austin Department of Civil Engineering
1 University Station C1792
Austin, TX 78712-0280 USA
(Office location: ECJ 9.227F)
PH (Direct): +1-512-475-8196
PH (Secretary): +1-512-471-4929
FAX: +1-512-471-6548
E-mail: tonon@mail.utexas.edu

Mary Lou Ralls, P.E., SME
Principal
Ralls Newman, LLC
2906 Pinecrest Drive
Austin, TX 78757
Phone: (512) 422-9080
Fax: (512)371-3778
E-mail: ralls-newman@sbcglobal.net

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	March, 2009
Desk Scan Completed	May, 2009
Prescan Meeting Held	May, 2009
Scan Conducted	August – September, 2009
Draft Summary Report submitted by SME	October, 2009
Draft Report Delivered to NCHRP and Panel	February, 2010
Final Report Delivered to NCHRP	September, 2011

Estimated Scan Cost and Funding

Actual cost and duration: $ 140,000; 2 week
Anticipated fund from FHWA: $25,000

Last Reviewed/Revised October 12, 2011

Topic Description

Local jurisdictions typically seek to encourage economic growth and development in their areas. Such growth often increases traffic demand on highways in the jurisdiction and at the same time makes it more difficult to secure land to expand highway capacity. Land-acquisition and other costs to provide increased capacity are then increased along with congestion and safety problems on the congested facilities. Reserving land for future highway corridor expansion in anticipation of future demand represents higher costs as well and makes the land unavailable for other development, and may appear to have been imprudent if growth does not occur as anticipated. Transportation agencies have sought to understand the business risks associated with right-of-way and other land acquisition to support decision making about corridor management.

The scan will investigate how metropolitan planning organization (MPOs), state departments of transportation (DOTs), and other transportation agencies have used risk-based forecasting and related analysis to address such issues as

- Identifying corridors that may experience capacity issues due to development.
- Addressing capacity issues in the development of long-range corridor plans
- Assessing factors that contribute most to land-use volatility
- Methods, models, and data used to forecast land use
- Integrating land use and volatility forecasts into transportation plans with a multi-year horizon.

The scan team will contact DOT and MPO officials and others involved in state and regional land use and transportation planning to identify best practices in problem framing, predictive modeling, gathering expert opinion, and using GIS and other data to identify incipient and potential development. Anticipated scan results may focus on the several key issues, including

- Forecasting corridor development
- Understanding how transportation improvements are influenced by land development
- Prioritizing funding allocations to minimize the negative effects of land development
- Protection of rural corridors and communities.

Original Scan Proposal Title(s): Risk-Based Forecasts of Land Volatility for Corridor Management and Sustainable Communities

Last Reviewed/Revised October 26, 2010

Scan Team Membership

Marsha C. Fiol – AASHTO Chair
Transportation and Mobility Planning Director
Virginia Department of Transportation
Transportation and Mobility Planning Division
1401 East Broad Street
Richmond, VA 23219
Phone: (804) 786-2985
E-mail: marsha.fiol@virginiadot.org

Matthew W. DeLong
Administrator, Real Estate Division
Michigan DOT
Bureau of Highway Development
425 W. Ottawa Street
P.O. Box 30050
Lansing, Michigan 48909
Phone: (517) 373-2200
Direct: (517) 373-2717
Fax: (517) 373-2209
E-mail: DeLongM@michigan.gov

Polina Knaster, P.E. PMP
District Program Manager, ROW Central District
New Jersey Department of Transportation
P.O. Box 600
Trenton, NJ 08625
Phone: (732) 625-4261
Fax: (732) 625-4270
Email: Polina.Knaster@Dot.state.nj.us

Charla Glendening, AICP
Senior Transportation Planner
Arizona Department of Transportation
Multimodal Planning Division
206 S. 17th Ave. Mail Drop 310B
Phoenix, AZ 85007
Phone: 602-712-7376
Email: cglendening@azdot.gov

Jerri Bohard
Transportation Development Division Administrator
Oregon Department of Transportation
555 13th Street, NE
Mill Creek Office Park, Suite 2
Salem, OR 97310
Phone: (503) 986-3435
E-mail: jerri.l.bohard@odot.state.or.us

Charlene Kay, P.E.
Eastern Region Transportation Planning Manager
Washington State Department of Transportation
2714 North Mayfair Street
Spokane, WA 99207-2090
Phone: 509.324.6195,
Fax: 509.324.6005
E-mail: kayc@wsdot.wa.gov

James H. Lambert, P.E., D.WRE, Ph.D. – SME
Assistant Director, Center for Risk Management of Engineering Systems
Research Associate Professor, Department of Systems and Information Engineering;
University of Virginia
PO Box 400747
112C Olsson Hall, 151 Engineers Way
Charlottesville, VA 22904, USA
Phone: (434) 982-2072/924-0960
Fax: (434) 924-0865
Email: lambert@virginia.edu

Shital Thekdi, M.S. – Assistant to SME
Consultant, and Ph.D. Candidate
Department of Systems and Information Engineering
University of Virginia
PO Box 400747
Charlottesville, VA 22904
Phone: (734)945-3945/(434)924-0960
Email: st4dw@virginia.edu

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	February 2011
Desk Scan Completed	July 2011
Prescan Meeting Held	July 2011
Scan Conducted	October-November 2011
Draft Summary Report submitted by SME	December 2011
Draft Report Delivered to NCHRP and Panel	February 2012
Final Report Delivered to NCHRP	July 2012

Estimated Scan Cost and Funding

Actual Cost and Duration: $170,000; 2 week

Last Reviewed/Revised July 15, 2012

Topic Description

Such issues as climate change, livable communities, sustainable development, and volatile fuel prices have increase public demand and legislative support for better coordination of transportation investment and land use management. Transit-oriented developments (TODs) are being promoted in many jurisdictions as a specific way to address many of the issues. A TOD is typically a compact area of mixed-use development, designed to encourage use of public transportation facilities such as rail stations and bus-rapid-transit services. TODs typically are planned with supportive standards for land uses, building density, and pedestrian-friendly to create attractive and walkable environments and easy access to public transportation services. Automobile parking, especially street-level parking, is limited by design and by the compactness of the TOD. Land above or adjacent to the transit station is deemed prime real estate for office, retail and residential purposes, and local authorities may entice developers to participate by permitting them to provide fewer parking spaces for TOD properties than would be required for developments elsewhere.

Increased demand for transit services extends beyond the TOD, however, leading to increased demand for parking near the train station or transit center. Traffic and parking by public-transportation users who are not TOD residents or customers can create congestion, safety hazards, and access difficulties. The goal of this scan will be to study TODs that have been particularly successful in resolving this conflict and accommodating the interests of non-resident users of the transit stations, the transit-service operator and funder, and the municipality in which the TOD is located, as well as developers, property owners, and occupants of the TOD.

The scan team will explore how TODs are designed to accommodate the parking needs of commuters who do not live within the TOD or the municipality in which the intermodal transportation facility is located, particularly

- Physical location and design of parking for public transit users
- Structures of parking fees for transit users versus shoppers and visitors to the TOD
- Ownership, regulation, management, and maintenance of parking for rail or intermodal transportation facilities users
- Structure and key provisions of development and management agreements or contracts with the various involved parties
- Key information to be considered in planning for a TOD.

Original Scan Proposal Title(s): Best Practices for Addressing Access and Parking Needs of Non-Resident Users of Rail and Intermodal Transportation Stations in Transit-Oriented Developments

Last Reviewed/Revised October 26, 2010

Scan Team Membership

Sharon Edgar –AASHTO Chair
Administrator
Bureau of Passenger Transportation
State Transportation Building
425 W. Ottawa St.
P.O. Box 30050
Lansing, MI 48909
T: 517-373-0471
Email: edgars@michigan.gov

Michael Connors
Transportation Assistant Planning Director
Connecticut Department of Transportation
Bureau of Policy and Planning
2800 Berlin Turnpike
Newington, CT 06131
T: (860) 594-2037
Email: michael.connors@ct.gov

Charles R. Carr
Public Transit Director
Mississippi Department of Transportation
Mail Code 61-01
P.O. Box 1850
401 North West Street, Suite 9050
Jackson, Mississippi 39215-1850
T: 601-359-7781
F: 601-359-7777
Email: ccarr@mdot.state.ms.us

Dylan Counts
Transportation Planning Supervisor
Public Transportation Division
Washington State Department of Transportation
401 Second Avenue South, Suite 300
Seattle, WA 98104
Phone: 206-464-1232
E-mail: countsd@wsdot.wa.gov

Jila Priebe
Office Chief
State Transit Planning & Programs
Division of Mass Transportation
California Department of Transportation
1120 N Street, Room 3300–MS 39
Sacramento, CA 94274-0001
Office: (916) 651-8243
Fax: (916) 657-4088
E-mail: jila_priebe@dot.ca.gov

Connie Morrison –Subject Matter Expert
26451 Mount Nebo Road
Onancock, VA 23417
Phone: (757) 789-5364
Cell: (517) 719-2640
E-mail: livethegoodlife_connie@yahoo.com

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	March 2012
Desk Scan Completed	August 2012
Prescan Meeting Held	August 2012
Scan Conducted	February 2013
Draft Summary Report submitted by SME	March 2013
Draft Report Delivered to NCHRP and Panel	May 2013
Final Report Delivered to NCHRP	December 2013

Estimated Scan Cost and Funding

Actual Cost and Duration: $108,000; 1.5 weeks. The scan was conducted as a combination of Type 1 and Type 2.

Topic Description

The leadership of transportation agencies have increasingly come to rely on explicit measurement of agency and transportation system performance as a means to improve management effectiveness and to demonstrate accountability for their use of public funds. One aspect of this trend is the development of maintenance quality assurance (MQA) programs to address performance in maintaining and preserving the facilities that provide services to the public. Since the 2004 Maintenance Quality Assurance Peer Exchange in Madison, Wisconsin, for example, several state departments of transportation (DOTs) have integrated MQA programs into their departments' business and strategic plans. MQA programs help decision-makers to understand maintenance conditions, set priorities and document the relationship between dollars spent and outcomes.

This scan will undertake to identify best practices for measuring performance in maintenance and preservation. The scan team will explore the experience of top-performing agencies, examining the agencies' business plans; system preservation strategic plans; and key performance-assessment areas, targets and objectives, data measures, data collection and validation procedures; and ways for presenting performance to senior management and the public. In addition, the scan team will seek out lessons from champions of accountability and identify variables that influence decision-making. Contacts within agencies might include managers responsible for maintenance and preservation activities, asset maintenance and management staff, quality assurance staff; performance- and budget-analysis staff; chief engineers; and legislative liaisons. The scan team will also seek insights regarding management tools and education and training programs that support successful development and application of MQA programs.

Original Scan Proposal Title(s): Best Practices in Performance Measuring for Highway Maintenance and Preservation.

Last Reviewed/Revised October 26, 2010

Scan Team Membership

Russell A. Yurek – AASHTO Chair
Director, Office of Maintenance
Maryland State highway Administration
7491 Connelley Drive
Hanover, MD 21076
Phone: (410) 582-5505
E-mail:ryurek@sha.state.md.us

Lonnie D. Hendrix
State Maintenance Engineer
Arizona Department of Transportation
206 South 17th Avenue, MD 176A
Phoenix, Arizona 85007
Phone: (602) 712-7972
Fax: (602) 712-6745
E-mail: lhendrix@azdot.gov

Nancy Albright
Director, Division of Maintenance
Kentucky Transportation Cabinet
Office of Project Delivery and Preservation
200 Mero Street
Frankfort KY 40622
Phone: (502) 564-4556
E-mail: 52ehro.albright@ky.gov

Don Hillis
Director of System Management
Missouri Department of Transportation
P.O. Box 270
Jefferson City, MO 65109
Office: (573) 751-2976
E-mail: don.hillis@modot.mo.gov

Jennifer Brandenburg
State Road Maintenance Engineer
North Carolina Department of Transportation
4809 Beryl Road
Raleigh, NC 27606
Phone: (919) 733-3725
Fax: (919) 733-1898
E-mail: jbrandenburg@ncdot.gov

Matt Haubrich
Asset Manager
Office of Maintenance
Iowa Department of Transportation
Phone: (515) 233-7902
E-mail: Matthew.Haubrich@dot.iowa.gov

Luis Rodriguez
Pavement Management Engineer
FHWA Resource Center
61 Forsyth Street, SW Suite 17T26
Atlanta, GA 30303
Ph: (404) 562-3681
Fax: (404) 562-3700
E-mail: luis.rodriguez@dot.gov

Katie Zimmerman, P.E. – SME
President
Applied Pavement Technology, Inc.
115 W. Main, Suite 400
Urbana, IL 61801
Phone: (217) 398.3977
Fax: (217) 398.4027
E-mail: kzimmerman@appliedpavement.com

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	February 2011
Desk Scan Completed	May 2011
Prescan Meeting Held	May 2011
Scan Conducted	October 2011
Draft Summary Report submitted by SME	November 2011
Draft Report Delivered to NCHRP and Panel	January 2012
Final Report Delivered to NCHRP	November 2012

Estimated Scan Cost and Funding

Actual Cost and Duration: $144,000; This scan was conducted as a workshop

Last Reviewed/Revised October 9, 2014

NCHRP 20-68 US Domestic Scan Program

Scan 10-04 Best Practices Supporting Traffic Incident Management (TIM) through Integrated Communication Between Traffic Management Centers and Law Enforcement and Effective Performance-Measurement Data Collection

Topic Description

Traffic incident management (TIM) depends fundamentally on effective communication among responsible personnel (for example, in incident reporting, response dispatch, and traffic management). Experience gained from each incident provides opportunities to improve agencies' TIM performance. Both communication and learning from experience are being enhanced by new technology and management practices such as computer assisted dispatch (CAD), inter-jurisdictional harmonization of agency communication procedures (for example, standardization of terminology and adoption of common radio frequencies), and channels for communicating with travelers and collecting data on traffic performance.

This scan will examine the TIM practices in regions that have enhanced TIM performance through integrated communication between traffic management centers and law enforcement and effective performance-measurement data collection. Scan participants will consider what are the important features of best practices in these regions and the lessons learned and insights gained in adopting those practices, with particular regard for adoption of CAD and related technology. The scan will explicitly consider the perspectives of transportation, law enforcement, and other incident-response agencies.

Original Scan Proposal Title(s): Traffic Incident Management (TIM) – Best Practices for Integration of Communication Between Traffic Management Centers and Law Enforcement and Performance Measurement Data Collection

Last Reviewed/Revised October 26, 2010

Scan Team Membership

Bruce E. Kenney III, P.E.
ITS Coordinator/Systems Management Engineer
Building 5, Room 550
1900 Kanawha Blvd. East
Charleston, WV 25305-0430
Office: 304-558-9449
Fax: 304-558-1209
Bruce.E.Kenney@WV.GOV

Sgt. Michael Tagliaferri
Maryland State Police
SHA Liaison
7491 Connelley Drive
Hanover, MD 21076
Office: 410-582-5616
Fax: 410-582-9880
mtagliaferri@sha.state.md.us

Kevin D. Price, P.E.
ITS Operations Engineer
Illinois Department of Transportation
Central Bureau of Operations
Tel: 847-705-4380
Fax: 847-705-4356
E-mail: Kevin.Price@illinois.gov

John Nelson
ITS Operations Program Manager
Colorado Department of Transportation
425 C Corporate Circle,
Golden, CO 80401
T: 303-512-5838
John.Nelson@dot.state.co.us

Teresa Krenning
TMC Manager
Missouri Department of Transportation
P.O. Box 270
Jefferson City MO 65102
Phone: 314-275-1534
Fax: 314-340-4509
E-mail:Teresa.Krenning@modot.mo.gov

Tiger Harris, P.E., PMP – SME
Senior Project Manager
Open Roads Consulting, Inc.
600 Perry Creek Drive, #2B
Chapel Hill, NC 27514
Mobile: 919-605-6406
tiger.harris@openroadsconsulting.com

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	July 2011
Desk Scan Completed	December 2011
Prescan Meeting Held	December 2011
Scan Conducted	June 2012
Draft Summary Report submitted by SME	October 2012
Draft Report Delivered to NCHRP and Panel	June 2013
Final Report Delivered to NCHRP	December 2013

Estimated Scan Cost and Funding

Actual Cost and Duration: $157,000; Two weeks

Last Reviewed/Revised October 9, 2014

The nation's transportation assets require continuing maintenance effort to keep them in a condition to provide safe and efficient service to the motoring public. The effort needed tends generally to increase as the assets age, as the level of their use increases, and as new facilities are developed and new technology is adopted to meet growing demands for service. Many agencies face budget constraints that make it very difficult to increase or even hold steady the scale of their maintenance staff and in-house programs. Some agencies have turned to outsourcing of maintenance activities to private-sector contractors as a means of coping.

This scan will focus on agencies' experience with outsourcing of maintenance activities, considering contractual arrangements, actual maintenance operations and management practices employed, and consequences for resource utilization and system performance. The team will meet primarily with the state, county or city officials involved in the day to day interaction with contractors hired to perform the maintenance activities. The team may also engage maintenance contractors in discussions at some locations and may visit t facilities used by the contractors.

The scan team will explore:

- The practices being used
- How the practices were implemented
- What obstacles had to be overcome to privatize maintenance functions
- Performance measures used to monitor maintenance activity
- Lessons learned from privatization experience, particularly regarding implementation
- Agency assessment of advantages and disadvantages of privatization of maintenance functions

Agencies considering privatization of maintenance functions could benefit from this scan. The scan team's report may be prepared to serve as a supplement to the AASHTO Maintenance Manual. The report would be helpful to senior agency management decision-makers and to maintenance managers, maintenance engineers, technicians, and supervising foremen.

Original Scan Proposal Title: Best management of Privatization of maintenance functions.

Scan Team Membership

Greg Duncan – AASHTO Chair
Director of Maintenance
Tennessee Department of Transportation
James K. Polk Bldg., Suite 400
Nashville, TN 37243
Phone: (615)741.2027
Fax: (615) 532.5995
Email: Greg.Duncan@tn.gov

Tim Lattner, P.E.
Florida Department of Transportation
Director, Office of Maintenance
605 Suwannee St., MS-52
Tallahassee FL 32399-0450
Office – (850) 410-5656
Fax – (850) 410-5511
Tim.Lattner@dot.state.fl.us

Caleb B. Dobbins, PE
State Maintenance Engineer
Bureau of Highway Maintenance
New Hampshire Department of Transportation
John O. Morton Building
7 Hazen Drive, PO Box 483
Concord, NH 03302-0483
Phone: (603) 271-2693
Email: Cdobbins@DOT.STATE.NH.US

Leslie Mix, P. E.
Maintenance Management Administrator
Louisiana DOTD
1201 Capitol Access Road (PO Box 94245)
Baton Rouge, Louisiana 70804-9245
Phone: 225-379-1796
Email: leslie.mix@la.gov

Jennifer Brandenburg
State Road Maintenance Engineer
North Carolina Department of Transportation
4809 Beryl Road
Raleigh, NC 27606
Phone: (919) 733-3725
Fax: (919) 733-1898
E-mail: jbrandenburg@ncdot.gov

Robert A. Younie, P.E.
State Maintenance Engineer
Iowa DOT
800 Lincoln Way
Ames, IA 50010
Phone: 515-239-1589
Fax: 515-239-1005
E-mail: bob.younie@dot.iowa.gov

Carolyn Dill, P.E.
Director of Maintenance Management
Maintenance Division
Texas Department of Transportation
150 Riverside Drive, North Tower, 5th Floor
Austin, TX 78701
Phone: 512-416-3056
E-mail: carolyn.dill@txdot.gov

Agustin Rosales
Chief, Office of Roadway Maintenance
Division of Maintenance
California DOT
1120 N Street , MS31,
Sacramento, CA 95814.
Phone: (916) 654-5319
E-mail: agustin_rosales@dot.ca.gov

Robert "Chris" Christopher
Director, Maintenance and Operations
Washington State Department of Transportation
P.O. Box 47358
Olympia WA 98504
Phone: (360) 705-7851
Email: christc@wsdot.wa.gov

Rodney Pletan, P.E. – Subject Matter Expert
7414 West Broadway
Forest Lake, MN 55025-8474
Home/office: 651-464-6636
Cell: 651-245-6292
E-mail: rodpletan@midco.net

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	February 2012
Desk Scan Completed	May 2012
Prescan Meeting Held	May 2012
Scan Conducted	August 2012
Draft Summary Report submitted by SME	September 2012
Draft Report Delivered to NCHRP and Panel	October 2013
Final Report Delivered to NCHRP	October 2014

Estimated Scan Cost and Funding

Actual cost and duration: $108,000; this scan was conducted as a workshop

Last Reviewed/Revised October 9, 2014

Accelerated bridge construction (ABC) practices are increasingly being used by transportation agencies to reduce the time and sometimes costs of producing, repairing, and replacing structures. ABC practices often involve use of prefabricated components (fabricated on- or off-site) that must be effectively connected together on site to function effectively. The purpose of this scan is to identify domestically-used ABC connection details that perform well under extreme event loading such as those experienced by bridges subjected to waves and tidal or storm-surges, seismic events, and other large lateral forces. The scan will augment information previously identified in the 2004 FHWA/AASHTO/NCHRP International Scan on Prefabricated Bridge Elements and Systems.

Topics to be considered by the scan include:

- Design, construction, and maintenance details for durable prefabricated bridge elements and systems (PBES) and other ABC connections that have a history of good performance under seismic and other extreme event loading;
- Seismic and other testing of ABC connection details;
- Specialized technology and standards used in monitoring, inspecting, and repair of PBES or other ABC connection details to ensure safety and serviceability with optimal connection performance and to minimize downtime during bridge construction and rehabilitation; and
- Relative costs for design, construction, maintenance, and inspection of various PBES or other ABC connection details.

The scan findings will inform efforts AASHTO and others to develop guidance for design, construction, maintenance, and inspection of PBES connections that perform well under seismic and other extreme event loading. Scan findings will help reduce uncertainty related to long-term performance of PBES connections and thereby address a major obstacle to the implementation of ABC nationwide. The findings could also contribute to the development of a strategic plan for accelerated bridge construction to support renewal of the nation's aging bridge population. The scan team implementation plan will indicate how information learned from the scan tour may be presented in national bridge conferences, bridge forums, and documents of FHWA, AASHTO, TRB, and NCHRP.

Original Scan Proposal Title: Performance of ABC Connections in Bridges Subjected to Multi Hazard and Extreme Events

Scan Team Membership

Jugesh Kapur, PE, SE.-AASHTO Chair
State Bridge Engineer
Washington State DOT
Bridge & Structures Office
P.O.Box 47340
Olympia, WA 98504-7340
Phone: (360) 705-7207
Email: kapurju@wsdot.wa.gov

Dan Tobias
Bridges and Structures
Illinois Department of Transportation
2300 S. Dirksen Parkway
Springfield, IL 62764-0002
Phone: 217-782-2912
Daniel.Tobias@illinois.gov

Michael Keever
California Department of Transportation
Office of Earthquake Engineering
1801 30th St, Sacramento, CA 95816
Phone 916-227-8806
mike_keever@dot.ca.gov

Joshua Sletten, S.E.
Structures Design Manager
Utah Department of Transportation
4501 South 2700 West
Box 148470
Salt Lake City, Utah 84114
Phone: 801-965-4879
Cell: 801-633-6314
E-mail: jsletten@utah.gov

Alexander K. Bardow, P.E.
Director of Bridge and Structures
Massachusetts Highway Department
10 Park Plaza, Suite 6430
BOSTON, MA 02116-3973
Phone: (617) 973-7571
Fax: (617) 973-7554
E-mail: Alexander.bardow@mhd.state.ma.us

Waseem Dekelbab Ph.D., P.E. – TRB Liaison
Senior Program Officer
Transportation Research Board
TRB Mail Room
500 Fifth Street, N.W.
Washington, DC 20001
Phone Number (202) 334-1409
Fax Number (202) 334-2006
E-mail Address: Wdekelbab@nas.edu

W. Phillip Yen, Ph.D., P.E.
Principal Bridge Engineer – Structural Dynamics
Office of Bridge Technology HIBT-1 / Rm E73-421
Federal Highway Administration
1200 New Jersey Ave. SE
Washington, DC 20590
Phone 202-366-5604
E-mail wen-huei.yen@dot.gov

Mehdi Saiid Saiidi, Ph.D., PE, FACI, FASCE – Subject Matter Expert (SME)
Department of Civil and Environmental Engineering
Mail Stop 258
University of Nevada, Reno
Reno, NV 89557
T: (775) 784-4839; (775) 784-8226
F: (775) 784-1390
Email: saiidi@unr.edu

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	July, 2011
Desk Scan Completed	November, 2011
Prescan Meeting Held	November, 2011
Scan Conducted	March-April, 2012
Draft Summary Report submitted by SME	June, 2012
Draft Report Delivered to NCHRP and Panel	October, 2012
Final Report Delivered to NCHRP	July, 2013

Actually Cost and Duration: $165,000; two weeks

Last Reviewed/Revised October 9, 2014

NCHRP 20-68 – "US Domestic Scan Program"
Scan 12-01 Advances in State DOT Superload Permit Processes and Practices

Description of Scan

The recently adopted AASHTO LRFR rating provisions for permits provide a major advance in applying uniform guidelines for overload permits. As the size and weights of these Superloads are ever increasing, there is a definite need to better understand the current State-of-Practice within the U.S. and achieve enhanced uniformity and safety in this area. NCHRP Report 359 "Bridge Rating Practices and Policies for Overweight Vehicles" provided a synthesis of permit rating policies. This proposed scan will build upon the findings of NCHRP Report 359, but will focus specifically on the topic of Superload permitting and compile further detail on the current policies and procedures that govern the authorization of Superload moves within the U.S. Of particular interest to state DOTs and the AASHTO Subcommittee on Bridges and Structures Technical Committees are current practices with regard to bridge ratings for Superload moves.

The scan team will engage the permit office and the bridge office of states such as CA, WA, TX, ID, NY, LA, MI, IL, PA, FL as well as others as appropriate to study in detail and document their permitting processes and procedures specifically for Superloads. The team will specifically focus on how these DOTs assure bridge safety and greater uniformity in Superload permitting. Also, as much of the Superload moves are associated with specific industries and ports the scan should encourage the invited state DOTs to address needs and concerns of industries within their jurisdiction (i.e: petrochemical, aviation, energy, construction, etc) which often have the need to transport non-divisible loads and the major ports. Superload movers such as Specialized Carriers and Rigging Association may prove to be significant sources of information regarding current and future needs for Superload movements DOTs may need to provide for.

The findings of this scan could provide a better understanding of the current State-of-Practice for Superload permitting. Additionally this scan will also identify the need for further research that may be needed to enhance bridge safety and provide improved guidance on the load rating methodology for Superloads that could be included in the AASHTO Manual for Bridge Evaluation. The scan findings would also provide valuable information to DOTs regarding future trends regarding Superloads. It is envisioned that this scan will be conducted as a Type 3 Scan – Peer Exchange.

Original Scan Proposal Title(s): DSP-13-03 Superload Permit Processes and Practices Used by State DOT Owners

Last Reviewed/Revised January 7, 2012

Scan Team Membership

Matt Farrar, AASHTO Chair
Bridge Engineer
Idaho Transportation Department
3131 W. State St.
Boise, ID 83707-1129
Phone: (208) 334-8538
E-mail: matt.farrar@itd.idaho.gov

Lubin Gao, Ph.D., P.E.
Senior Bridge Engineer – Load Rating
HIBT-10, E75-115
Office of Bridge Technology
Office of Infrastructure
Federal Highway Administration
1200 New Jersey Ave., S.E.
Washington, DC 20590
Telephone: (202)366-4604
Email: Lubin.Gao@dot.gov

Scot Becker
State Bridge Engineer
Wisconsin Department of Transportation
4802 Sheboygan Avenue
PO Box 7916
Madison, Wisconsin 53717
Phone: 608-266-5161
E-mail: scot.becker@dot.wi.gov

Randy Braden
Assistant Bureau Chief
Maintenance Bureau
Alabama Department of Transportation
1409 Coliseum Boulevard
Montgomery, AL 36130-3050
Phone: (334) 242-6474
Fax 334-353-6618
E-mail: bradenr@dot.state.al.us

Jeff G. Honefanger
Manager
Ohio Department of Transportation
Special Hauling Permits Section
1980 West Broad Street, Mail Stop 5140
Columbus, OH 43223
Phone: 614-351-5520
Fax: 614-728-4099
E-mail: jeff.honefanger@dot.state.oh.us

Kevin I. Keady
Office of Structure Design and Analysis
Structure Maintenance & Investigations, Division of Maintenance
California Department of Transportation
1120 N Street
Sacramento, CA 95814
Phone: (916) 227-2446
Fax: (916) 227-8357
E-mail: kevin.keady@dot.ca.gov

Jonathan (Jon) Mallard
S&B Hauling Permits Engineer
Virginia Department of Transportation
1401 E. Broad St.
Richmond, VA 23219
Phone: (804) 786-9189
E-mail: Jonathan.Mallard@vdot.virginia.gov

Michael Wight
Senior Structural Designer
Maine Department of Transportation
Transportation Building
16 State House Station
Augusta, ME 04333-0016
Phone: (207) 624-3435
Fax (207) 624-3491
Email: Michael.Wight@maine.gov

Hani Nassif, P.E., Ph.D., Professor – SME
Office: SOE A-Wing #131
Department of Civil & Env. Engineering
Rutgers, The State Univ. of New Jersey
96 Frelinghuysen Road
Piscataway, NJ 08854
Phone: (848)445-4414
Fax: (732) 445-8268
Email: nassif@rutgers.edu

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	March 2013
Desk Scan Completed	July 2013
Prescan Meeting Held	August 2013
Scan Conducted	December 2013
Draft Summary Report submitted by SME	January 2014
Draft Report Delivered to NCHRP and Panel	March 2014
Final Report Delivered to NCHRP	December 2014

Actual Cost and Duration: $169,000. This scan was conducted as a workshop.

Last Reviewed/Revised July 22, 2016

NCHRP 20-68 – "US Domestic Scan Program"

Scan 12-02 Advances in Strategies for Implementing Integrated Corridor Management (ICM)

Description of Scan

Many jurisdictions have implemented a variety of strategies for maximizing flow on facilities by using all available pavement and managing their facilities using new technologies and better techniques. Most recognized the importance of inter-jurisdictional coordination with emergency responders, maintenance and incident response, and construction management as well as timely notification to the public in managing their systems. Monitoring traffic operations through use of a traffic management centers with reliable detection and surveillance and with available strategies to deploy such as incident response is an active engagement in the reduction of recurring and non-recurring congestion. Pulling this all together through Integrated Corridor Management (ICM) is essential to successful system management. However, actively integrating the separate strategies such as ramp metering, arterial coordination, detour planning, traveler information, and managed lanes in a real time manner, new challenges in TMC staffing and funding are introduced.

To identify successful strategies that have been successfully implemented this scan will examine practices in DOTs, MPOs and other jurisdictions in states such as Florida, New York, Utah, Texas, and Washington to examine topics such as:

- What are best practices in staffing real time corridor management
  - Classifications, team assignments,
  - Inter-jurisdictional staff sharing
  - After-hours staffing or call-out processes
- How are ICM projects and operations funded
- What is the role (if any) of contracted-services
- What system-support staffing changes are needed

Of special interest are considerations made regarding freight corridors.

Anticipated scan results may focus on the several key issues, including

- Understanding how to most efficiently implement ICM technologies
- Funding
- Addressing staffing issues
- Outsourcing of certain functions

Original Scan Proposal Title(s): DSP-13-12 Institutional Challenges of Implementing Integrated Corridor Management (ICM)

Last Reviewed/Revised January 7, 2012

Scan Team Membership

Dennis Motiani – AASHTO co-chair
Executive Director, Transportation Systems Management
New Jersey Department of Transportation
1035 Parkway Ave, Trenton
New Jersey 08625
Phone: (609)530-4690
E-mail: Dhanesh.Motiani@dot.state.nj.us

Neil C. Spiller – FHWA co-chair *(travel for week 1)*
Transportation Specialist
U.S. Department of Transportation
FHWA Office of Operations (HOP)
Mail Stop: E86-205
1200 New Jersey Avenue, SE
Washington, DC 20590
Phone: 202.366.2188
E-mail: Neil.Spiller@dot.gov

Anne Reshadi
Chief, Statewide Traffic Operations Center
Wisconsin Department of Transportation
433 W. St. Paul Ave. Suite 300
Milwaukee, WI 53203-3007
Phone: 414.227.2149
E-mail: anne.reshadi@dot.wi.gov

Todd B. Westhuis
Acting Director, Office of Traffic Safety and Mobility
Operations Division
New York State Department of Transportation
50 Wolf Road
Albany, NY 12232
Phone: (518) 457-0271
E-mail: todd.westhuis@dot.ny.gov

Nicholas Compin, Ph.D.
Branch Chief and Statewide Connected Corridors Project Manager
Division of Traffic Operations
California Department of Transportation
1120 N Street MS 36
Sacramento, California 95814
Phone: 916-651-1247
E-mail: nicholas.compin@dot.ca.gov

Brian Umfleet
Traffic Operations Engineer
Missouri Department of Transportation
Office: (314) 275-1540
Cell: (314) 568-8487
E-mail: brian.umfleet@modot.mo.gov

Ahmad Sadegh, Ph.D. – SME
Telvent USA, LLC
Vice president, Transportation
1650 W. Crosby Rd
Carrolton, TX 75006
Phone: 972-323-4868
Mobile: 215-704-7799
Fax: 972-323-5412
E-mail: Ahmad.Sadegh@telvent.com

Kevin T. Miller, Ph.D – Co-SME
Area Manager
Infrastructure Business
2686 Locksley Court
Troy MI 48083
Mobile: 313-354-2126
E-mail: kevin.miller@telvent.com

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	March – July 2013
Desk Scan Completed	October 2013
Prescan Meeting Held	October 2013
Scan Conducted	June-July 2014
Draft Summary Report submitted by SME	August 2014
Draft Report Delivered to NCHRP and Panel	October 2014
Final Report Delivered to NCHRP	March 2015

Actual Cost and Duration: $200,000. This scan was conducted as traveling scans for two non-consecutive weeks

NCHRP 20-68 – "US Domestic Scan Program"

Scan 12-03 Advances in Safety Program Practices in "Zero-Fatalities" States

Description of Scan

AASHTO is engaged in developing a national strategy on highway safety, titled "Toward Zero Deaths" (TZD). This national strategy is building on the experiences gained in safety planning and implementation efforts implemented to date. In developing this strategy AASHTO is reaching out to stakeholders that highway infrastructure professionals do not typically interact with. Also, the national strategy is including an emphasis on safety culture as it relates to both road users in general and to highway agencies that need to balance safety with other factors in their decision-making process.

All states have developed Strategic Highway Safety Plans (SHSP), and many states have updated their plans at least once. Each SHSP has a highway fatality reduction goal, and several states have set their goals at zero. Such a goal has been controversial, with the main questions being:

- What does a zero fatality goal mean to a state and what does this mean to the state's SHSP?
- What are the performance measures in place for a zero fatality state?
- What are the consequences if an agency does not meet its goal of zero fatalities?
- How can a non-zero goal (such as 475 fatalities) be acceptable?

The scan team will examine practices in states counties, metropolitan areas and municipalities that have highway safety goals of zero fatalities. The team will examine topics such as:

- The agency's management philosophy
- Public attitude towards established goals
- collaboration with existing and non-traditional safety partners,
- Reaching consensus with all stakeholders on an aggressive highway safety goal.
- Developing a culture of safety and collaboration among partner agencies and associations.
- Developing, Implementing and Evaluating and modifying their SHSP based on the aggressive goal.
- Marketing a zero fatality goal to agency leadership and staff, safety partners, and the public.

Those agencies that have adopted a zero goal have overcome challenges related to establishing the goal and to implementing their SHSPs. It is anticipated that information documented by the scan team from these agencies would support other agencies working on updating their SHSPs to include a TZD goal and could also contribute to the national effort being led by AASHTO.

Original Scan Proposal Title(s): DSP-13-16 Noteworthy Practices of Zero Fatalities States

Last Reviewed/Revised January 7, 2012

Scan Team Membership

Priscilla A. Tobias, PE, AASHTO Chair
State Safety Engineer
Illinois Dept of Transportation
Bureau of Safety Engineering
2300 S. Dirksen Parkway, Room 323
Springfield, IL 62764
Phone: 217-782-3568
Fax: 217-782-0377
E-mail: Priscilla.Tobias@illinois.gov

Kelly K. Hardy, P.E.,
Safety Program Manager
AASHTO
444 North Capitol Street, NW, Suite 249
Washington, DC 20001
Phone: 202-624-5868
E-mail: khardy@aashto.org

Jennifer Warren
Federal Highway Administration
FHWA Office of Safety
1200 New Jersey Avenue, SE, Washington DC 20590
Phone: 202-366-2157
E-mail: Jennifer.Warren@dot.gov

Rita Morocoima-Black
Champaign County Regional Planning Commission (CCRPC)
Champaign Urbana Urbanized Area Transportation Study (CUUATS)
Transportation Planning Manager
1776 E. Washington St.
Urbana IL. 61802
Phone: (217) 328-3313
Fax: (217) 328-2426
E-mail: rmorocoi@co.champaign.il.us

Girish (Gary) N. Modi, P.E
Division Chief
Pennsylvania Department of Transportation
Bureau of Highway Safety & Traffic Engineering
400 North Street | Harrisburg PA 17105
Phone: 717.783.1190 | Fax: 717.783.8012
E-mail: GMODI@pa.gov

Marie Walsh, Ph.D.
Director, Louisiana Local Technical Assistance Program (LTAP)
Technology Transfer Center
4099 Gourrier Ave
Baton Rouge, LA 70808-4443
Phone: (225)767-9184
E-mail: mbwalsh@ltrc.lsu.edu

Jeremy Vortherms
State Safety Engineer
Iowa Department of Transportation
800 Lincoln Way
Ames, IA 50010
Phone: 515-239-1267
E-mail: Jeremey.Vortherms@dot.iowa.gov

Susan B Herbel, Ph.D. – Co-SME
Principal
Cambridge Systematics
4800 Hampden Ln #800
Bethesda, MD 20814
Phone: 301.347.9155
E-mail: sherbel@camsys.com

Whitney B. Alper – SME assistant
Transportation Analyst
Cambridge Systematics
38 East 32nd Street, 7th Floor
New York NY 10016
Phone: 212-209-6640
Direct: 646-364-5490
E-mail: walper@camsys.com

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	March 2013
Desk Scan Completed	August 2013
Prescan Meeting Held	August 2013
Scan Conducted	March-April 2014
Draft Summary Report submitted by SME	May 2014
Draft Report Delivered to NCHRP and Panel	September 2014
Final Report Delivered to NCHRP	June 2016

Actual Cost and Duration: $ 222,000**.** This scan was conducted as traveling scans for two non-consecutive weeks

Last Reviewed/Revised July 22, 2016

NCHRP 20-68 – "US Domestic Scan Program"
Scan 12-04 Advances in Transportation Agency Knowledge Management

Description of Scan
Over the next decade Transportation Agencies (STA) will be faced with the challenge of losing a tremendous amount of institutional knowledge due to increased numbers of retirements of long term employees combined with decreases in their staffing levels. As such, there is an increased importance in mentoring and training staff as well as effectively documenting and transferring knowledge to a workforce that is more highly skilled at information retrieval and access. Several agencies such as Virginia DOT, West Virginia DOT Washington DOT and the Federal Highway Administration have begun to formalize their information sharing, coaching, and knowledge management processes to insure that their staffs continue to maintain their proficiency in providing a high level of service within their jurisdiction. However, addressing the loss of a tremendous amount of experience and institutional history and knowledge remains a challenge for many.

The scan team will examine practices in states counties, metropolitan areas and municipalities such as Virginia DOT, West Virginia DOT Washington DOT and the Federal Highway Administration that have had successes. The team will examine topics such as:

- examine successful practices of information sharing, coaching, and knowledge management for staff development
- Identify differing approaches to capturing and providing for information/knowledge needs of various organizational functions such as project management, preconstruction, construction and maintenance operations
- Gather existing documented good knowledge management practices
- Identify additional needs to assure proper knowledge management

The scan team will conduct the study through a combination of site visits and a workshop.

It is anticipated that information documented by the scan team from these agencies would provide other interested agencies with successful strategies for knowledge management that would allow for:

- Earlier, high-performing new employees
- Improved quality of transportation products (infrastructure planning, designing, constructing, and maintaining)
- Less risk to organization due to improved employee understanding of process and policy
- Less turnover due to improved employee competency/satisfaction (improved understanding of role, accelerated expertise, and successful completion and delivery of work products)

Original Scan Proposal Title(s): DSP-13-17 Best Practices in Transportation Agency Knowledge Management

Last Reviewed/Revised January 7, 2012

Scan Team Membership

John Halikowski – AASHTO Chair
Director
Arizona DOT
Director of Research
Arizona Department of Transportation
State Transportation Board
206 South 17th Avenue, Mail Drop 100A
Phoenix, AZ 85007
Phone: 602-712-7227
E-mail: jhalikowski@azdot.gov

Carin Michel
Marketing & Communications Team Leader
FHWA Resource Center
10 South Howard Street, Suite 4000
Baltimore, MD 21201
Phone: 410-962-2530
E-mail: carin.michel@fhwa.dot.gov

Arthur "Turo" Dexter
Knowledge Resources Manager
DOT / Federal Transit Administration (TAD)
1200 New Jersey Av SE, Room E44-446,
Washington DC 20590
Phone: (202) 366-1388
E-mail: arthur.dexter@dot.gov

Maureen L. Hammer, PhD
Knowledge Management director
Virginia Department of Transportation
530 Edgemont Road,
Charlottesville, Virginia 22903
Phone: 434- 293-1987
E-mail: Maureen.Hammer@VDOT.virginia.gov

Becky Burk
Performance Excellence Manager,
Maryland State Highway Administration
Office of the Administrator
707 North Calvert Street, C-400
Baltimore, MD 21202
Phone: 410-545-5691
E-mail: Bburk@sha.state.md.us

Lori Dabling
State Project Manager
Utah Department of Transportation
PO Box 148460
Salt Lake City, UT 84114-8460
Phone: 801-964-4456
E-mail: ldabling@utah.gov

Lee Wilkinson
Director, Operations and Finance Division
Iowa Department of Transportation
800 Lincoln Way
Ames, IA 50010
Phone: 515-239-1340
E-mail: Lee.Wilkinson@dot.iowa.gov

Leni Oman
Director, Office of Research & Library Services
Washington State Department of Transportation
310 Maple Park Avenue SE, Room SC21
PO Box 47372
Olympia, WA 98504-7372
Phone: 360-705-7974
E-mail: OmanL@wsdot.wa.gov

Frances Harrison – SME
Spy Pond Partners
1165R Massachusetts Avenue
Arlington, MA 02476
Phone: 617-500-4875
E-mail: fharrison@spypondpartners.com

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	March 2013
Desk Scan Completed	August 2013
Prescan Meeting Held	August 2013
Scan Conducted	November 2013
Draft Summary Report submitted by SME	December 2013
Draft Report Delivered to NCHRP and Panel	February 2014
Final Report Delivered to NCHRP	October 2014

Actual Cost and Duration: $158,000. This scan was conducted as a workshop

Last Reviewed/Revised July 22, 2016

NCHRP 20-68 – "US Domestic Scan Program"
Scan 13-01 Advances in Developing a Cross-Trained Workforce

Description of Scan:

Nationally, there is an increasing need for DOT organizations to be more efficient with limited resources and a reduced workforce. One strategy that is being tried within some agencies is to cross train their workforce. A cross-trained workforce can be more efficient and agile in adapting to an agency's changing missions, priorities and budgets so common today.
This scan team will identify and meet with Human Resources and other appropriate representatives from state DOTs that have been successful in applying this strategy. The scan team will investigate:

- Host agency statistics describing the jurisdiction, agency size and organization, and applicable legislation, rules, standards, policies and mandates pertaining to cross-training of the workforce.
- Successful implementation strategies, advances in practice, emerging technologies and lessons learned and barriers to implementation
- QA/QC procedures including training plans and required certifications
- Performance measures including metrics, performance evaluations and corrective action procedures
- Sustainability topics such as ensuring future resources, succession planning and training, and developing and maintaining champions for the effort.

The team will identify successful strategies and the conditions under which each is applicable and best suited. The team will document the items listed above as well as examples of successful cross-training programs, position descriptions, and implementation plans.
Implementation of Scan results could benefit agencies by providing examples of how DOT workforces in other agencies have been made more cost efficient, more technically proficient, and more able to adapt to changing conditions. This Scan would best be accomplished through a peer exchange type of scan.

Original Scan Proposal Title(s): DSP-13-19 "Best Management Practices For Developing A Cross-Trained Workforce"

Last Reviewed/Revised July22, 2015

Scan Team Membership

Amanda Holland – AASHTO Chair
Division Operations Manager
Administrative Services Division
Alaska DOT&PF
Chair, AASHTO HR Subcommittee,
Phone: 907-465-8815
Email: 74ehroo.holland@alaska.gov

Olivia P. Alexander
Team Leader, Supervisory and Leadership Team,
Talent Development Division
FHWA, Office of Human Resources
Southeast Federal Center Building (Rm E63-340)
1200 New Jersey Avenue, S.E.
Washington, DC 20590-9898
Phone: 202.366.1160
Email: Olivia.P.Alexander@dot.gov

Robert J. Samour, Sr.
Senior Deputy State Engineer, Operations
Arizona Department of Transportation
206 S. 17th Ave., MD 102A
Phoenix, AZ 85007
Tel: (602) 712-8274
Email: Rsamour@azdot.gov

Jane Lee
Chief, HR Officer
Human Resources
Central Services Division
Oregon Department Of Transportation,
355 Capitol Street NE, MS#12
Salem, OR 97301-3871
Tel: (503) 378-3408
Fax: (503) 986-3862
Email: Jane.S.Lee@odot.state.or.us

Greg Duncan, P.E.
Director of Maintenance
Tennessee Department of Transportation
James K. Polk Bldg., Suite 400
Nashville, TN 37243
Phone: (615)741.2027
Phone: (615)741.0800
Fax: (615) 532.5995
E-mail: Greg.Duncan@tn.gov

Anne "Vicki" Arpin
Agency Human Resources Administrator
Connecticut Department of Transportation
Phone: (860) 594-3100
Fax: (860) 594-3369
Email: Vicki.arpin@ct.gov

Todd A. Emery, P.E.
Deputy State Engineer, Statewide Operations
Arizona Department of Transportation
206 S 17th Ave
Phoenix AZ, 85007
Phone: 602-712-8274
Email: temery@azdot.gov

Lee Wilkinson
Director, Operations and Finance Division
Iowa Department of Transportation
800 Lincoln Way
Ames, IA 50010
Phone: 515-239-1340
E-mail: Lee.Wilkinson@dot.iowa.gov

Rick A. Smith, SPHR – *Subject Matter Expert (SME)*
114 Cross Creek
Lakeway, TX 78734
Cell: 512-363-7842
Work: 512-637-9853
Email: Rixter2015@gmail.com

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	August 2014
Desk Scan Completed	October 2014
Prescan Meeting Held	October 2014
Scan Conducted	March 2015
Draft Summary Report submitted by SME	April 2015
Draft Report Delivered to NCHRP and Panel	November 2015
Final Report Delivered to NCHRP	August 2016

Actual Cost and Duration: $165,000. This scan was conducted as a workshop

Last Reviewed/Revised July 16, 2020

NCHRP 20-68 – "US Domestic Scan Program"
Scan 13-02 Advances in Civil Integrated Management (CIM)

Description of Scan:

Over the past 20 years there has occurred a dynamic evolution in the use of computers to assist in highway construction efforts. The application of computer driven total station, laser guidance systems, automatic machine guidance systems, 3D, 4D, or 5D modeling of complex construction strategies, or remote modeling of assemble of bridge elements, has resulted in more efficiency and accuracy than ever before. In addition, contract administration has evolved such that contract administration tools are being used that enhance partnering between owners, consultants, materials suppliers, and contractors to optimize just in time delivery of services and materials.

The purpose of this scan is to examine projects that utilize CIM technologies and partnering efforts between State DOTs, consultants, contractors, and materials suppliers. This scan will consider organization factors (e.g. size of program degree of centralization or decentralization, and outsourcing) that may influence a state DOT, consultant, materials supplier, or contractors' ability to utilize CIM. The scan team will identify and examine CIM type projects from across the nation for the scan. Possible projects include the North Carolina Turnpike Authority Triangle Expressway, Dallas Fort Worth Connector, Multnomah Oregon's Sellwood Bridge Project, the Dallas Fort Worth Connector, and the Wisconsin DOT Zoo Interchange.

The team should meet with project management, design, materials suppliers, and construction staff to assess the effectiveness of the technology and partnering efforts currently being used by the state DOT's, consultants, materials supplier, and contractors. Specifically, the scan team will document:

- Identified proven intelligent construction technologies
- Construction project performance measures being used
- Successful partnering techniques including virtual meetings, wireless data sharing, and paperless communication as applicable.

The results of this scan will assist agencies in identifying when and where to effectively employ intelligent construction technology. The results will also identify successful partnering techniques being used by state DOT's, consultants, contractors, and materials suppliers in utilizing intelligent construction technology. Finally, the results of this scan will serve as a valuable precursor to a new research project approved by the AASHTO Standing Committee on Research for inclusion in NCHRP's FY2014 research program, problem statement D-12 "Civil Integrated Management: Benefits and Challenges".

Agencies will benefit from this scan from gaining knowledge of the use of highway construction projects utilizing emerging intelligent construction technologies and partnering for the fast, efficient, and safe delivery of projects.

Original Scan Proposal Title(s): DSP-13-02 Civil Integrated Management (CIM)

Last Reviewed/Revised April 2, 2013

Scan Team Membership

John Adam
Highway Division director
Iowa Department of Transportation
800 Lincoln Way
Ames, Iowa 50010
Phone: (515) 239-1124
E-mail: john.adam@dot.iowa.gov

Katherine Petros – FHWA Co-chair
Team Leader, Infrastructure Analysis and Construction Team
Federal Highway Administration
Office of Infrastructure R&D
6300 Georgetown Pike, HRDI-20
McLean, VA 22101
Phone: 202-493-3154
Fax: 202-493-3161
E-mail: 77ehrooz77n.petros@fhwa.dot.gov

Rebecca Burns
Bureau of Project Delivery
Pennsylvania Department of Transportation
400 North Street
Harrisburg PA 17105
Phone: (717) 787-6989
E-mail: reburns@pa.gov

Duane Brautigam
Director, Office of Design
Florida Department of Transportation
605 Suwannee Street
Tallahassee, FL 32399-0450
Phone: (850) 414-4175
E-mail: duane.brautigam@dot.state.fl.us

Julie Kliewer, PhD, P.E.,
Assistant State Engineer for Construction
Arizona DOT
206 South 17th Avenue, MD 172A
Phoenix AZ 85007
Phone: 602.712.7323
Fax: 602.254.5128
E-mail: Jkliewer@azdot.gov

John Lobbestael, PS
Supervising Land Surveyor
Michigan DOT
Van Wagoner Building
425 W. Ottawa
P.O. Box 30050
Lansing, MI 48909
Phone: 517-335-5550
E-mail: LobbestaelJ@michigan.gov

Stan Burns (Travel during week 1 in July)
Director of Asset Management
Utah Department of Transportation
4501 South 2700 West
P.O. Box 148380
Salt Lake City, Utah 84114-8380
Phone: 801-965-4190
E-mail: sburns@utah.gov

Randall R. Park, P.E. (Travel during week 2 in August)
Project Development Director
Utah Department of Transportation
4501 South 2700 West
P.O. Box 148380
Salt Lake City, Utah 84114-8380
Phone: (801)965-4022
E-mail: rpark@utah.gov

Charles T. Jahren, MBA, Ph.D, PE – SME
W. A. Klinger Teaching Professor
Assistant Chair for Construction Engineering and Professor
456 Town Engineering Building
Department of Civil, Construction and Environmental Engineering
Iowa State University
Ames, Iowa 50011
Phone: (515) 294-3829
Fax: (515) 294-3845
E-mail: cjahren@iastate.edu

Execution Schedule

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Scan Conducted	July – August 2014
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Actual Cost and Duration: $ 235,000. This scan was conducted as traveling scans for two non-consecutive weeks

Last Reviewed/Revised July 22, 2015

NCHRP 20-68 – "US Domestic Scan Program"

Scan 13-03 Leading Practices in Use of FRP Composites in Transportation Infrastructure

Description of Scan:

Fiber Reinforced Polymer (FRP) composite materials have been researched and demonstrated in the structural applications for more than 25 years. Among transportation agencies, FRP materials have been used for bridge decks, beams, piling, buried structures, concrete reinforcing, post-tensioning, and for repair and strengthening of existing structures, but not much as a primary structural material. Other industries and agencies—notably the U. S. Navy—reportedly are studying and using FRP more extensively.

A scan on the state of the practice will inform the transportation industry on successful applications of FRP within or adaptable to DOTs. The scan team made up primarily of bridge engineers from state DOTs could meet with representative from various agencies and document applications such as:

- Maine DOT to discuss their " Bridge in a Backpack" technology
- Michigan DOT to discuss their use of FRP post-tensioning and reinforcing
- West Virginia DOT & New York State DOT to explore their use of FRP for Pile and column repair and strengthening
- Caltrans to document emergency earthquake repair applications
- Ohio DOT, NYSDOT & West Virginia DOT to discuss FRP deck applications
- The Naval Facilities Engineering Service Center's ongoing research in FRP for bridge applications

Information to be gained would be:

- Types of FRP applications used
- Project plans and specifications
- Materials and bid cost data
- Performance history
- Suggestions for improving procedures
- Identify barriers to more wide spread use
- Lessons learned

A synthesis of this information can be developed after the scan for distribution to an audience of State DOTs and FHWA offices, other Federal and local agencies, FRP industry manufacturers, university researchers, consultants, county and local DOT's. A scan of this subject would provide insights on the use of FRP for the AASHTO Subcommittee on Bridges and Structures, the AASHTO Subcommittee on Materials and others.

Original Scan Proposal Title(s): DSP 13-16 State of the Practice in FRP Composite in Transportation Infrastructure

Last Reviewed/Revised July22, 2015

Scan Team Membership

Wayne Frankhauser - AASHTO Chair
Assistant Program Manager, Bridge Program
Maine DOT
16 State House Station
Augusta, ME 04333
Phone: 207-557-8924
Email: Wayne.FrankhauserJr@maine.gov

Stacy McMillan, P.E.
Structural Liaison Engineer
Bridge 80ehrooz80
Missouri DOT
105 W. Capitol Ave
Jefferson City, MO 65102
Phone: 573-526-0250
Email: Stacy.mcmillan@modot.mo.gov

David Rister
Bridge Construction Engineer
South Carolina DOT
PO Box 191
Columbia, SC 29201
Phone: (803) 737-1490
Cell: (803) 201-9206
Email: ristergd@scdot.org

Jamal Elkaissi, PE, MS
Civil (Structural) Engineer- Bridge Design and Construction
Structure Team- Resource Center, FHWA
12300 W Dakota, Suite 340
Lakewood, Colorado 80228
Work: 720-963-3272
Email: jamal.elkaissi@dot.gov

William Potter, P.E.
Florida Department of Transportation
M.H. Ansley Structures Research Center
2007 E. Paul Dirac Drive
Tallahassee, FL 32399
Office – 850.921.7106
Main – 850.921.7100
Email: William.Potter@dot.state.fl.us

DeWayne Wilson PE
Bridge Asset Manager
Washington State DOT
P.O.Box 47340
Olympia, WA 98504-7340
Office: 360.705.7214
Email: WilsonD@wsdot.wa.gov

Steven Kahl, P.E.
Supervising Engineer
Experimental Studies Group
Operations Field Services Division
Michigan Department of Transportation
8885 Ricks Road, Lansing, MI 48917
Office: (517) 322-5707
Fax: (517) 322-5664
Cell: (517) 898-3428
Email: Kahls@michigan.gov

Jerome S. O'Connor, P.E., F, ASCE –SME
Executive Director, Institute of Bridge Engineering
Dept. of Civil, Structural and Environmental Engineering, University at Buffalo
228 Ketter Hall, UB North Campus, Buffalo, NY 14261
Phone: (716) 645-5155
Email: jso7@buffalo.edu

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	August 2014
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Scan Conducted	June – July 2015
Draft Summary Report submitted by SME	August 2015
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Actual Cost and Duration: $197,000. This scan was conducted as traveling scans for two non-consecutive weeks.

Last Reviewed/Revised July 16, 2020

NCHRP 20-68 – "US Domestic Scan Program"

Scan 14-01 Leading Management Practices in Determining Funding Levels for Maintenance and Preservation

Legislators and leadership within transportation agencies continuously face the challenge of providing appropriate funding to insure adequate maintenance of their aging transportation assets. While MAP-21 creates a streamlined and performance-based surface transportation program that aims to ensure a state of good repair, Federal funding long term is uncertain; and gas tax revenues, a primary source of state as well as federal transportation funds across the country, are generally declining, increasing the challenge of determining how to allocate resources between maintenance of current facilities and investment to upgrade or extend the system. When polled in mid-2013, many state maintenance managers indicated that securing adequate funding is among the most pressing issues they face.

This scan will undertake to identify funding allocation practices within state DOTs and other transportation agencies that have successfully ensured reliably adequate funding to support the delivery of efficient and effective maintenance programs. Agencies such as Washington State DOT, North Carolina DOT, Alabama DOT, Mississippi DOT, Kansas DOT, Tennessee DOT, and the San Francisco Metropolitan Transportation Commission are top-performing agencies that may prove excellent organizations to study.

The team will examine various successful practices in funding within agencies such as the use of dedicated revenue streams, performance-optimization using general revenues, or other specifically examining:

a. How agencies determine funding for system maintenance and preservation;
b. How agencies allocate funding across their districts and regions;
c. How districts/ regions allocate funding for specific types of maintenance tasks;
d. How agencies determine the optimal budgetary allocations;
e. Performance measures established to monitor the effectiveness of the budget provided for maintenance, and how the performance measures link to future funding allocations.

The team should specifically examine the agencies budgetary process to identify:

a. Who is involved;
b. Methods of establishing budget levels (i.e. $/lane-mile or miles of roads maintained/maintenance worker);
c. How GASB-34 affects the budget process;
d. Data reporting requirements, management systems and their use in the budget process;
e. Legislative initiatives and mandates;
f. Method of forecasting maintenance funding requirements, etc.

The findings of this scan could provide a better understanding of how to implement successful approaches to ensure reliably adequate funding to support effective and efficient maintenance and preservation programs.

Original Scan Proposal Title(s): Best practices in determining funding levels for maintenance and preservation

Scan Team Membership

Mark C. McConnell P.E. – AASHTO Chair
Deputy Executive Director/Chief Engineer
Mississippi Department of Transportation
P.O. Box 1850
Jackson, MS 39215-1850
Phone: (601) 359-7004
Fax: (601) 359-7050
Email: mmcconnell@mdot.state.ms.us

Thomas Van
FHWA, Office of Asset Management, Pavements, and Construction, Asset Management Team (HIF-HIAP-40 / Room E73-458)
1200 New Jersey Avenue, S.E.
Washington, DC 20590-9898
Phone: 202-366-1341
Email: Thomas.Van@dot.gov

Tim Lattner
Director, Office Maintenance
Florida Department of Transportation
605 Suwannee Street, MS 52
Tallahassee FL 32399
Phone: (850) 410-5757
Email: tim.lattner@dot.state.fl.us

Tony Sullivan
Assistant Chief Engineer – Operations
Arkansas State Highway & Transportation Department (AHTD)
P.O. Box 2261
10324 Interstate 30, State Highway Building
Little Rock, AR 72203
Phone: 501-569-2221
Fax: 501-569-2688
Cell: 501-944-2557
Email: tony.sullivan@ahtd.ar.gov

Lonnie Watkins
State Management Systems Engineer
Management Systems and 83ehrooz83nts Unit
4809 Beryl Road
Raleigh, NC 27606
Phone: (919)835-8421
Email: lrwatkins@ncdot.gov

Laura J. Mester, CPA
Chief Administrative Officer
Michigan Department of Transportation
State Transportation Building
425 W. Ottawa St.
P.O. Box 30050
Lansing, MI 48909
Phone: (517) 241-2674
mesterl@michigan.gov

Cory Pope, P.E.
Program Development Director
Utah Department of Transportation
P.O. Box 143600
Salt Lake City, UT 84114-3600
Contact Info:
Phone: 801-965-4082
Cell: 801-910-0880
Email: corypope@utah.gov

Dale Doughty
Director of the Bureau of Maintenance and Operations
Maine Department of Transportation
16 State House Station, Transportation Building,
Augusta, ME 04333
Phone: (207) 624-3600
Cell: (207) 592-2580
Email: dale.doughty@maine.gov

Katie Zimmerman, P.E. – SME
President
Applied Pavement Technology, Inc.
115 W. Main, Suite 400
Urbana, IL 61801
Phone: (217) 398.3977
Fax: (217) 398.4027
Cell: (217) 369-9353
E-mail: kzimmerman@appliedpavement.com

Execution Schedule

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Chairs and Team Members Identified	December 2014
Desk Scan Completed	May 2015
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Scan Conducted	September – October 2015
Draft Summary Report submitted by SME	November 2015
Draft Report Delivered to NCHRP and Panel	January 2016
Final Report Delivered to NCHRP	September 2016

Actual Cost and Duration: $206,000. This scan was conducted as traveling scans for two non-consecutive weeks

Last Reviewed/Revised March 7, 2017

NCHRP 20-68 – "US Domestic Scan Program"

Scan 14-02 Successful Intermodal Corridor Management Practices for Sustainable System Performance

Intermodal corridor management strives to match the right services to meet demand at the least social and economic cost while maximizing the return on previous and future investments in infrastructure and services. As a management concept, intermodal corridor management builds on the principles of multimodal corridor planning, integrated corridor management and active traffic management. It recognizes that multiple modes can satisfy a variety of travel demands within a corridor, and that most movement of people, goods, information and services in a corridor involves movement between modes. With scarce funds available for transportation system preservation, safety, operations and capacity additions, all modes must provide more than just choice–they must deliver performance.

To identify successful strategies that have been used to implement intermodal corridor management, this scan will examine practices in DOTs, MPOs and other jurisdictions where corridor management has been taken beyond the concept of integrating technical operational capabilities to optimizing the potential contributions for a variety of modes within corridors. Potential examples include Massachusetts DOT, District of Columbia DOT, Maryland State Highway Administration, Portland Metro, Dallas, San Diego (SANDAG), Minneapolis, and Sacramento (Caltrans HQ). For each location visited, the scan team will explore such matters as:

a. How a stated purpose/vision for the management of the corridor(s) was developed, and how public input was used;
b. How relevant modes and linkages were identified;
c. How potential capacity/travel market share was determined for each mode;
d. What modal performance parameters were selected and how those compare to emerging MAP 21 performance measures;
e. Governance arrangements and how institutional impediments were overcome;
f. Technical and technological challenges to improving multimodal and intermodal performance;
g. Success indicators;
h. Cost to implement and return on investment;
i. Support for sustainable transportation.

This scan will aim to produce practical guidance and examples for state DOTs and MPOs seeking to gain the best return on investments in multi-modal corridors to ensure each mode contributes to satisfying existing and latent demand for mobility and services. The scan will build on previous work on the technological challenges of integrated highway corridor management and multimodal integrated corridor management to examine the specific technical and institutional challenges and opportunities for matching the investment in appropriate modal options to meet community, economic and environmental needs. Finally, the findings of this scan could provide DOTs and MPOs wishing to implement intermodal corridor management with examples of the successful integration of modes within corridors to provide needed services and the institutional arrangements that can bring intermodal corridor management to fruition.

Original Scan Proposal Title(s): Intermodal Corridor Management for Sustainable System Performance

Scan Team Membership

Jean Wallace – AASHTO Chair
Director, Office of Policy Analysis Research and Innovation
Minnesota Department of Transportation
1500 West Country Road, B2 Waters Edge
Roseville, MN 55113
Phone: 651-366-3181
Email: Jean.Wallace@state.mn.us

Neil Spiller
Transportation Specialist, FHWA
Office of Operations, FHWA HQ
1200 New Jersey Ave, SE
Washington, DC 20590
Phone: 202.366.2188
Email: neil.spiller@dot.gov

Brian C. Hoeft, P.E.
Director of FAST (Freeway and Arterial System of Transportation)
Regional Transportation Commission of Southern Nevada
4615 West Sunset Road
Las Vegas, NV 89118
Tel: (702) 432-5311
Cell: (702) 357-6928
Email: HoeftB@rtcsnv.com

James H. Lambert, P.E., D.WRE, Ph.D.
Assistant Director, Center for Risk Management of Engineering Systems
Research Associate Professor, Department of Systems and Information Engineering;
University of Virginia
PO Box 400747; 112C Olsson Hall, 151 Engineers Way
Charlottesville, VA 22904, USA;
Phone: (434)982-2072/924-0960;
Fax 924-0865
Email: lambert@virginia.edu

Kari Martin
University Region Planner
Michigan DOT
4701 West Michigan Avenue
Jackson, Michigan 49201
Phone: 517-750-0407
Email: MartinK5@michigan.gov

Steve Takigawa
Deputy Director for Maintenance and Traffic Operations
California Department of Transportation
PO Box 942874
Sacramento, CA 93401-5415
Phone: 916-654-6823
Email: steve.takigawa@dot.ca.gov

Lynn Weiskopf
Director, Statewide Policy Bureau
New York State Department of Transportation
50 Wolf Road, Floor 6 – Ave A – 9th St
Albany, NY 12232-2633
T: (518) 457-2320
Email: lynn.weiskopf@dot.ny.gov

Brian J. Smith, AICP –Subject Matter Expert (SME)
701 E Ballantrae Drive
Shelton, WA 98584
Home: 360-868-2025
Mobile: 360-451-6679
Email: BrianSmith2014@comcast.net

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	March 2015
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Prescan Meeting Held	June 2015
Scan Conducted	October 2015
Draft Summary Report submitted by SME	November 2016
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Actual Cost and Duration: $204,000. This scan was conducted as a workshop

Last Reviewed/Revised March 7, 2017

NCHRP 20-68 – "US Domestic Scan Program"

Scan 14-03 Successful Approaches for the Development of an Organization-wide Safety Culture in Transportation Agencies

Improving transportation-system safety is an important national goal pursued by government transportation agencies and others. New technology and regulatory action can contribute to reducing transportation fatalities, injuries, and property damage, but experience in many fields has shown that more fundamental changes in culture are needed as well. Road users and organizations with a role in transportation safety implicitly accept the levels of risk inherent in the system. Changing the culture entails enhancing everyone's understanding of what these risk levels are, how their actions influence their own and others' risks, and actions they can take to reduce risk in general. Large organizations in a variety of business areas have learned that changing their own organization's safety culture is an important step toward improving safety for their customers as well as themselves, and that such change can yield a range of benefits. Discussions of traffic safety culture are becoming more frequent among transportation safety professionals, but clear, practical paths forward for highway agencies have yet to be developed. One promising approach is to begin at home, with the safety culture of the agency itself.

The objective of this scan is to examine organizations that have successfully designed and implemented strategic safety-culture transformation programs. The scan team will examine research and experience with strategic safety culture transformation programs that could be applied to enhance highway safety.

Specifically, the team should examine:

- The characteristics of a strong organizational safety culture;
- How organizational safety culture differs by type of organization;
- Examples, within the transportation industry and beyond, of successful initiatives to change organizational culture;
- Examples of specific Department of Transportation and State Highway Safety Office initiatives to change traffic safety culture;
- How improvements in safety culture can be sustained.

Changing safety culture is a complex challenge and, while individual initiatives managed by specific departments or addressing specific issues contribute to changing the safety culture, it is necessary to develop a process for changing values and attitudes so that safety is a factor in every transportation decision, whether personal or organizational. The scan may entail discussions with insurance companies and private- and public-sector organizations concerned with internal and customer safety as well as with public transportation agencies. This scan will result in information for highway safety stakeholders, including state DOTs, on how to assess and transform traffic safety culture within their organization and among their road-users customers. It is envisioned that the scan report may include executive-level briefing material on organizational safety culture as applied to transportation organizations and "getting-started" guidance for DOT staff to begin identifying opportunities for creating or improving a traffic safety culture within the DOTs.

Original Scan Proposal Title(s): Development of an Executive-Level Primer for Improving Organizational Traffic Safety Culture

Scan Team Membership

Rudy Malfabon, P.E. – AASHTO Chair
Director
Nevada Department of Transportation
Office: 775-888-7440
Cell: 702-499-5084
Email: rmalfabon@dot.state.nv.us

Mike Tooley
Secretary
Montana DOT
2701 Prospect Avenue.
PO Box 201001
Helena MT 59620
T: 406-444-6201
Email: mitooley@mt.gov

Katie Fleming
Research Analyst
Mn/DOT, Traffic Safety & Technology
Mail Stop 725
1500 West County Rd B-2
Roseville, MN 55113
Phone: (651)234-7013
Fax: (651)234-7006 fax
Email: Katie.fleming@state.mn.us

Timothy E. Barnett, P.E., PTOE
State Safety Operations Engineer
Office of Safety Operations
Alabama Department of Transportation
1110 John Overton Drive
Montgomery, AL 36110
Office: 334-353-6464
Cell: 334-239-5526
Fax: 334-353-6470
Email: barnettt@dot.state.al.us

John Milton
Washington State Department of Transportation
414 Olive Way, Suite 400
Seattle, Washington 98101-1209
Phone – (360) 791-9242 or (206) 381-6423
Fax – (206) 381-6442
Email: MiltonJ@wsdot.wa.gov

Steven A. Buckley, P.E.
State Highway Safety Engineer
Bureau of Transportation Safety & Technology
700 SW Harrison Street, 6th Floor
Topeka, KS 66603-3745
785-296-1148
buckley@ksdot.org

Mark Shelton, P.E.
District Engineer
MoDOT, Southeast District
P.O. Box 160
Sikeston, MO 63801
Phone: 573.472.5341
Cell: 573.837.6171
Fax: 573.472.5381
Email: mark.shelton@modot.mo.gov

Chimai Ngo
Transportation Specialist
Office of Safety, FHWA (HAS-20 / E71-105)
12 New Jersey Ave, S.E.
Washington, DC 20590-9898
Phone: 202.366.1231
Email: Chimai.ngo@dot.gov

Dr. Nicholas J. Ward -SME
Mechanical and Industrial Engineering
College of Engineering
Montana State University
Office: 406-994-5942
Phone: 406-581-1633
Email: nward@ie.montana.edu

Execution Schedule

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Chairs and Team Members Identified	July 2014
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Actual Cost and Duration: $159,000; This scan was conducted as a workshop

Last Reviewed/Revised July 22, 2016

NCHRP 20-68 – "US Domestic Scan Program"

Scan 15-01 Developing And Maintaining Construction Inspection Competence

State transportation agencies face the prospect of losing a tremendous amount of institutional knowledge due to retirements of long-term employees and reductions in overall staffing levels. An area of specific concern is the loss of experienced construction inspectors. Increasing complexity of construction methods and use of more varied contracting methods have added challenges for agencies' efforts to develop and maintain their competence in construction inspection. For many agencies, these efforts include certification and training programs. This scan will investigate such programs, focusing particularly on leading states, counties, metropolitan areas, municipalities and other transportation agencies adoption of teaching and learning methods such as the following examples:

- Mentoring programs
- Hands on training
- Online training
- Just-in-time training
- Video training
- Public private training partnerships
- Innovative hiring practices
- Certification testing
- Pay for qualifications

The scan team will consider learning outcomes, measure of success, and how agencies plan to maintain competence in the future.

The scan is envisioned to be conducted as a Type 3 Scan (peer exchange). The scan team may interview trainers and construction inspectors from the states identified to have innovative practices. States to review might include Florida, Texas, Virginia, Oregon, South Carolina, Michigan, California, and Pennsylvania. Consideration should also be given to investigating successful programs offered by universities, contractor associations, materials trade associations, and other organizations. The scan will gather information on innovative methods of implementation and performance measurement, including determining competency.

Original Scan Proposal Title(s): Practices to Develop and Maintain competence in Construction Inspectors

Scan Team Membership

Robert Wight – AASHTO Chair
Director of Construction And Materials
Utah Department of Transportation
4501 South 2700 West
Salt Lake City, UT 84114-8220
Phone: 801-633-6252
Email: rwight@utah.gov

Darby Clayton
Regional Engineer for District 5 & 8
Contract Administration Division
West Virginia DOT
1900 Kanawha Blvd, East
Building 5, Room A-722
Charleston WV, 25305-0330
Phone: 304-558-9567
Fax: 304-558-3132
Email: J.Darby.Clayton@wv.gov

Mark Chaput
Deputy Bureau Director
Bureau of Highway Field Services
Michigan DOT
Phone: 517-322-3331
Cell: 517-206-1802
Email: chaputm@michigan.gov

Andy Alvarado, P.E.
Chief, Office of Contract Administration and Risk Management
California Department of Transportation
Caltrans Division of Construction (MS 44)
1120 N Street
Sacramento, CA 95814
(916) 653-8633 Office
(916) 798-6028 Cell
Email: andy.alvarado@dot.ca.gov

David Hoyne, P.E.
Bureau Director
Construction & Materials Bureau
Vermont Department of Transportation
Phone: (802) 828-2593
Direct: (802) 828-0110
Fax: (802) 828-2795
Email: David.Hoyne@vermont.gov

Romeo R. Garcia
Bridge & Tunnel Construction Engineer
Office of Infrastructure
Office of Asset Management, Pavement and Construction
Construction Management Team
HIAP-30, Room E73-473
Federal Highway Administration (FHWA)
1200 New Jersey Avenue, SE
Washington, DC 20590
Phone: 202-366-1342
Email: Romeo.Garcia@dot.gov

Robert A. Lutz
AMRL Manager
AASHTO Materials Reference Laboratory (AMRL)
4441 Buckeystown Pike, Suite A
Frederick, MD 21704-7507
Phone: 240-436-4801
E-mail: rlutz@amrl.net

Jeff Lewis
Construction and Contract Administration Engineer
Construction and Contract Administration
FHWA Resource Center
650 Capitol Mall Suite 4-100
Sacramento, CA 95814
Office: (916) 498-5035
Cell: (916) 599-1286
E-mail: Jeff.Lewis@dot.gov

Rick A. Smith, MSHRM, SPHR – Subject Matter Expert (SME)
4134 Heather Lakes Drive
Little River, SC 29566
Home: 770-663-8998
Cell: 743-321-3711
Email: rixter2015@gmail.com

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	October 2015
Desk Scan Completed	February 2016
Prescan Meeting Held	February 2016
Scan Conducted	October 2016
Draft Summary Report submitted by SME	November 2016
Draft Report Delivered to NCHRP and Panel	March 2017
Final Report Delivered to NCHRP	December 2017

Actual Cost and Duration: $ 224,000; This scan was conducted as a workshop

Last Reviewed/Revised December 31, 2017

NCHRP 20-68 – "US Domestic Scan Program"
Scan 15-02 Bridge Scour Risk Management

Flooding and scour are recognized by the bridge community as the leading cause of bridge failures in the United States. About 83 percent of the structures listed in the National Bridge Inventory cross waterways and are thereby exposed to the threats of flooding and scour. Agencies responsible for bridge safety seek effective threat-mitigation strategies, including installation of scour countermeasures to monitor, control, inhibit, change, delay, or minimize stream instability and bridge-scour susceptibility.

This scan will examine practices of states, counties, metropolitan areas, municipalities and other transportation agencies, to identify and document successful approaches to reducing bridge flooding and scour risk through appropriate use of countermeasures. The scan will also consider how innovative bridge owners assess structural vulnerability or bridge scour susceptibility.

The scan team would examine innovative approaches such as

1. Risk-based decision analysis. For
    a. selection and installation of countermeasures
    b. selection, installation, and management of monitoring systems
    c. bridge replacement rather than use of countermeasures or monitoring systems
2. Inspection procedures for scour countermeasures
3. Alert systems to trigger inspections during flood events
4. Road-closing and -reopening decision process
5. Bridge inspection and documentation procedures during and after a flood event, including updating bridge inspection reports and the agencies' Scour Plan of Action.

The scan team will focus on practices for inspection, monitoring, countermeasure selection and placement, and risk management for scour-critical and scour-susceptible bridges individually and in networks of varying sizes. By documenting and sharing successful practices the scan team will produce a valuable resource for use by bridge owners, state and local bridge inspectors, bridge designers and bridge management staff in reducing the risk to the travelling public due to flooding and scour.

Original Scan Proposal Title(s): Best Practices in Monitoring, Mitigation and Risk Management of Scour Critical and Scour Susceptible Bridges

Last Reviewed/Revised March 17, 2015

Scan Team Membership

Rebecca Curtis –AASHTO Chair
Bridge Management Engineer
Michigan DOT
425 West Ottawa St
PO Box 30050
Lansing, MI 48909
Phone: 517-449-5243
Email: curtisr4@michigan.gov

Xiaohua "Hanna" Cheng, PhD, P.E.
Civil Engineer, Bureau of Structural Engineering
New Jersey Department of Transportation
1035 Parkway Ave,
Ewing Township, NJ 08625
Phone: 609-530-2464
Email: Xiaohua.cheng@dot.nj.gov

Stephanie Cavalier, P.E.
Bridge Scour Manager
Louisiana Department of Transportation and Development
(LADOTD)
1201 Capitol Access Road
Baton Rouge, LA 70804
Phone: 225-379-1329(O) 225-978-1504I
Fax: 225-379-1786
Email: stephanie.cavalier@la.gov

Rick Marz
The head of Wisconsin Inspection Program
Bureau of Structures Maintenance Chief
Wisconsin DOT
Phone: 608-266-8195
Cell: 608-516-6376
Email: Richard.Marz@dot.wi.gov

Jon Bischoff
Geotechnical Engineer Specialist
Utah Department of Transportation
4501 South 2700 West
Salt Lake City, Utah 84119
Phone: 801-441-9484
Email: jonbischoff@utah.gov

Kevin Flora
Senior Bridge Engineer, Structure Maintenance and Investigations
California Department of Transportation
(CALTRANS)
1801 30th Street
Sacramento, CA 95816
Phone: (916) 227-8036
Email: kevin.flora@dot.ca.gov

Hani Nassif, P.E., Ph.D., Professor – SME
Office: SOE A-Wing #131
Department of Civil & Env. Engineering
Rutgers, The State Univ. of New Jersey
96 Frelinghuysen Road
Piscataway, NJ 08854
Phone: (848)445-4414
Fax: (732) 445-8268
Email: nassif@rutgers.edu

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	September 2015
Desk Scan Completed	November 2015
Prescan Meeting Held	December 2015
Scan Conducted	July 2016
Draft Summary Report submitted by SME	August 2016
Draft Report Delivered to NCHRP and Panel	July 2017
Final Report Delivered to NCHRP	August 2018

Actual Cost and Duration: $241,000. This scan was conducted as a workshop

Last Reviewed/Revised July 16,2020

NCHRP 20-68 – "US Domestic Scan Program"
Scan 15-03 Successful Preservation Practices for Steel Bridge Coatings

Approximately 30% of the bridges in the U.S. national bridge inventory have steel superstructures. When selecting this type of superstructure for a bridge, the operating agency incurs an obligation to maintain the coating on the steel to protect it from corrosion to obtain its full service life. However, recoating existing steel bridges is a large and costly task for transportation agencies. Many agencies are faced with significant challenges in balancing available resources with major rehabilitation, reconstruction and complete replacement needs due largely to corrosion caused by failing coating systems. Agencies are anxious to identify improved coating and recoating methods that will extend the service life and save significant costs by reducing the frequency of recoating, or the need to recoat at all, thereby delaying costly major rehabilitation and replacement activities caused by corrosion.

This scan will attempt to identify effective strategies and practices used by transportation agencies in the areas of:

- Coating option decision making
- Surface preparation
- Specifications for coating systems including :
    - Removal and replacement
    - Overcoating
    - Spot/zone coating
- Use of Performance-based contracts
- Evaluation practices for in situ coatings prior to recoating,
- Evaluation of performance of overcoat and replacement coatings
- Inspector qualifications
- Contractor qualifications
- Determination of Agency Funding Levels
- Agency commitment to supporting future preservation of coatings

The scan team will visit with agencies that have assets in aggressive corrosive environments that have successful programs to identify the aspects of those programs such as innovative coating systems and recoating practices that lead to success.

The team will research significant challenges and successful corrosion mitigation recoating strategies. Of special interest are successful strategies, technologies and approached in dealing with concerns associated with environmentally hazardous materials.

Information documented by the scan team would provide effective strategies and other specific information for use by bridge owners in their preservation of coating systems for steel structures that will result in substantial cost savings and significant extension of service life. The audiences for this information are state and local bridge inspectors, bridge designers, bridge maintenance personnel, materials engineers and bridge preservation and management staff within state, local or other transportation agencies.

Original Scan Proposal Title(s): Bridge Recoating Best Practices

Scan Team Membership

Paul Vinik, M.S.ChE, P.E. –AASHTO Chair
State Structural Materials Engineer
Florida DOT
605 Suwannee Street
Tallahassee, FL 32399-0450
Telephone: 352-955-6686
Cell: 352-231-5335
Fax: 850-412-8374
Email: paul.vinik@dot.state.fl.us

Charlie Brown
Area engineer, structures coating division
Maryland State Highway Administration
Phone: (410) 545-8425
Cell No.: (410) 598-4109
Email: cbrown4@sha.state.md.us

Mike Todsen
Special projects engineer
Office of Bridges and Structures
Iowa DOT
Phone: 515- 233-7726
Email: Michael.Todsen@dot.iowa.gov

Ray Bottenberg, P.E.
Bridge Preservation Managing Engineer
Bridge Engineering
Oregon DOT
4040 Fairview Industrial Dr SE, MS 4
Salem, OR 97302-1142
Phone: (503) 986-3318
Email:
Raymond.D.BOTTENBERG@odot.state.or.us

Tom Schwerdt
Lead paint chemist
Texas DOT
125 E. 11Th St
Austin, Texas 78701
Phone: (512) 506-5883
Email: Tom.Schwerdt@txdot.gov

Justin Ocel, PhD, PE
Structural Steel Research Program Manager
Bridge and Foundation Engineering Team
Federal Highway Administration Turner-Fairbank Highway Research Center HRDI-40
6300 Georgetown Pike
McLean, VA 22101
Phone: (202) 493-3080
Fax: (202) 493-3477
Email: justin.ocel@dot.gov

Sudhir Palle P.E. –SME
Senior Research Engineer
Kentucky Transportation Center
176 Raymond Bldg.,
Lexington, KY, 40506
Phone: 859-257-2670
Cell: 859-333-4019
Fax: 859-257-8177
Email: Sudhir.Palle@uky.edu

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	September 2015
Desk Scan Completed	November 2015
Prescan Meeting Held	December 2015
Scan Conducted	May 2016
Draft Summary Report submitted by SME	June 2016
Draft Report Delivered to NCHRP and Panel	December 2016
Final Report Delivered to NCHRP	April 2017

Actual Cost and Duration: $ 206,000; This scan was conducted as a workshop.

Last Reviewed/Revised July 16, 2020

NCHRP 20-68 – "US Domestic Scan Program"

Scan 16-01 Leading Practices in the Use of the Highway Safety Manual for Planning, Design and Operations

Performance based processes that use data driven safety performance offer significant potential for project and operating cost reduction. The Highway Safety Manual (HSM) is a resource that provides safety knowledge and tools in a useful form to facilitate improved decision-making based on such safety performance. While other initiatives have focused on analytical examples of implementation of the Highway Safety Manual (HSM), this Domestic Scan will provide an opportunity for critical conversations around processes and the work force components not usually included in HSM implementation related presentations or meetings that occur elsewhere.

This scan will evaluate the processes, job aids/tools, workforce training, and manner in which states have institutionalized the HSM as part of performance based processes and asset management in planning, design and operations. The fiscally constrained environment that state DOTs operate in today require revisiting assumptions about safety performance benefits as well as processes and decisions that drive meeting full safety standards. The HSM provides tools to allow agencies to change their design for safety of a facility from traditional "design standards" of the AASHTO Green Book, Roadside Guide, MUTCD and state design manual to a more performance based statistical approach. Utilization of the HSM will help a DOT satisfy existing societal values of providing the highest level of safety performance for the financial and other resources provided to the DOT. .

The scan will focus on safety performance analysis using the HSM in planning, design and operations in transportation agencies. It is proposed that the scan engage the central and regional offices participating in the planning, design and operations of facilities in the States of Missouri, Florida, Idaho, Illinois, Kentucky, New York, Oregon, Washington, and Utah. In some states implementation will vary across regions and much value can be gained from learning about practices beyond the central office

The scan is envisioned to be conducted as a Type 2 Scan (Reverse Scan). The scan results will be documented in a report focusing on business processes, job tools/aids, workforce and training, and ways in which state DOTs implemented the HSM in planning, design and operations as part of a performance-based approach. The audience would be all state DOTs given the anticipated changes to the FHWA's 13 controlling criteria for geometric design. The report will cover lessons learned and key components of success. A webinar or series of webinars can be hosted where participating states share their individual implementation experiences and lessons learned.

Original Scan Proposal Title(s): Using the Highway Safety Manual for decisions in planning, design and operations

Scan Team Membership

John C. Milton, Ph.D., P.E. –AASHTO Chair
Director of Quality Assurance and Transportation System Safety
Washington State Department of Transportation
310 Maple Park Avenue SE
Olympia, Washington 98504
Phone: 360-704-6363
Cell: 360-791-9242
Email: MiltonJ@wsdot.wa.gov

Michael Vaughn, PE
Highway Safety Improvement Program
Division of Traffic Operations
Kentucky Transportation Cabinet
Phone: 502-782-4923
Email: Mike.Vaughn@ky.gov

Samuel Sturtz
Transportation Planner
Office of systems planning
Iowa Department of Transportation
Phone: 515-239-1788
Email: samuel.sturtz@dot.iowa.gov

Jerry Roche, P.E.
USDOT, Federal Highway Administration
Office of Safety – Data & Analysis Tools Team
105 6th Street
Ames, IA 50010
Phone: 515-233-7323
Email: Jerry.Roche@dot.gov

Dave Duncan
Transportation Manager 1, Region 4
Strategic Transportation Investments Division
James K. Polk Building, Suite 1000
505 Deaderick Street
Nashville, TN 37243-0344
Phone: 615.532.6131
Email: David.A.Duncan@tn.gov

Dennis Emidy, P.E.
HSIP Engineer
Maine Department of Transportation
Bureau of Planning
16 State House Station
Augusta, ME 04333
Phone: (207) 624-3309
Mobile: (207) 557-4604
Email: dennis.emidy@maine.gov

Darren J. Tobic, Ph.D—SME
Principal Traffic Engineer
MRIGlobal
2332 Raven Hollow Rd
State College, PA 16801
Phone: 814-237-8831
Cell: 814-574-9194
Email: dtorbic@mriglobal.org

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	February 2017
Desk Scan Completed	May 2017
Prescan Meeting Held	May 2017
Scan Conducted	October-November 2017
Draft Summary Report submitted by SME	January 2018
Draft Report Delivered to NCHRP and Panel	June 2018
Final Report Delivered to NCHRP	February 2019

Actual Cost and Duration: $230,000. This scan was conducted as traveling scans for two non-consecutive weeks

NCHRP 20-68 – "US Domestic Scan Program"

Domestic Scan 16-02 Leading Landscape Design Practices for Cost-Effective Roadside Water Management

Hotter, drier summers; warmer, wetter winters; and more frequent extreme weather events are confronting transportation agencies with increasingly frequent and intense floods, droughts, and temperature extremes that adversely affect transportation infrastructure. Transportation agencies, seeking ways to mitigate these adverse impacts, have been exploring principles and practices of "green infrastructure" for roadside water management, using such as techniques as water harvesting, landform grading, rain gardens, micro-catchment basins, and large-watershed actions as components of transportation development projects and operations. The fundamental intent of these techniques is to work with natural processes, to "build with nature." While the details of particular applications often are determined by geography, many of the techniques are transferrable to other climatic and landscape settings; the principles and practices being developed for designing, developing, and managing green infrastructure are generally applicable.

This scan will review recent experience with green infrastructure practices for roadside water management to identify planning and design criteria, management practices, and exemplary applications that may be broadly useful in transportation agencies nationwide. Because much of the leading-edge experience is coming from local and regional (sub-state) agencies, an important feature of this scan will be consideration of how exemplary applications may be scaled up to inter-city corridor and statewide systems. The scan may contribute toward development of nationally useful guidelines and policies on effective green infrastructure practice.

The following applications, recognized as successful advances in green infrastructure practice, are candidates for the scan team's attention:

- Green Infrastructure Center in Charlottesville, Virginia's use of GIS mapping
- City of Hot Springs, Arkansas 2015 project on identification and restoration of the city's highest value natural resources
- Meadowood Mall and Mount Rose I-580 Nevada, construction of micro-catchment basins in a dry arid climate
- Green Infrastructure Planning Guide 2013 developed for Ulster County, New York
- Construction of the Staten Island Bluebelt, Staten Island, New York,
- Landscape-based, green infrastructure approaches utilized along Lake Michigan, Chicago, Il.

The scan results will be documented in a report focusing on information gathered and lessons learned on how green infrastructure techniques can best be utilized to mitigate extreme weather events, and address the programming, planning, and mitigating, requirements of projects by transportation agencies. The information gathered will also provide transportation professionals examples of best management practices for green infrastructure while focusing on the larger regional scale of GIS mapping to determine the best smaller site-scale solutions. The results will explore how to think at multiple scales — from the site to the neighborhood, to the town, city, county, watershed and region — and then back again. It will explore the assumption that working multiple scales yields multiple benefits that might be missed through small scale approaches.

The scan is envisioned to be conducted as a Type 2 Scan (Reverse Scan). The scan will be a strong tool for transportation agencies, partners, and the public by sharing successful strategies, emerging practices and lessons learned that will help them to make better decisions on balancing growth and development with the conservation of natural assets over the long term while dealing with changing weather patterns.

Original Scan Proposal Title(s): Leading Landscape Design Practices for Cost-Effective Roadside Water Management

Scan Team Membership

Jennifer Taira – AASHTO Chair
Senior Landscape Architect
Office of Landscape Architecture Standards and Procedures
California Department of Transportation
1120 N Street, MS 28
Sacramento CA 95814
T: 916.654.4817
Jennifer.taira@dot.ca.gov

Charles Hebson
Manager, Surface Water Resources Division
Maine Dept. of Transportation
16 State House Station
Augusta, ME 04333-0016
T: 207.557.1052
Charles.Hebson@maine.gov

Garrett W. Jackson
Hydrology Program Manager
Washington State Department of Transportation
310 Maple Park Ave SE
Olympia, WA 98504
(360) 705-7485 Direct
(206) 403-6830 Mobile
(360) 705-6833 Fax
Email: JacksGa@wsdot.wa.gov

Mark Masteller, P.L.A.
Chief Landscape Architect
Iowa Department of Transportation
800 Lincoln Way
Ames, IA 50010
Office – 515-239-1424
Cell – 515-290-3882
Mark.Masteller@iowadot.us

Ken Graeve
Erosion and Stormwater Management Unit Chief
Office of Environmental Stewardship
Minnesota DOT
395 John Ireland Blvd
St Paul, MN 55155
651-366-3613
101ehrooz.graeve@state.mn.us

Brian Smith
Ecologist
FHWA – Resource Center
4749 Lincoln Mall Drive Suite 600
Matteson, IL 60443
Phone: 708-283-3553
Fax: (708) 283-3501
Email: bsmith@dot.gov

Lucy B Joyce, ASLA, RLA, CPM –SME
1729 Desert Peach Dr
Carson City, NV 89703
Phone: 775-450-706
Email: joycelucy6@gmail.com

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	January, 2017
Desk Scan Completed	May, 2017
Prescan Meeting Held	May 2017
Scan Conducted	November 2017
Draft Summary Report submitted by SME	December 2017
Draft Report Delivered to NCHRP and Panel	April 2018
Final Report Delivered to NCHRP	February 2019

Actual Cost and Duration: $250,000. This scan was conducted as a workshop

NCHRP 20-68 – "US Domestic Scan Program"

Domestic Scan 17-01 Successful Approaches for the Use of Unmanned Aerial Systems by Surface Transportation Agencies

A recent AASHTO survey has revealed that at least 19 different State DOT are exploring the use of the equipment. Several state DOTs are actively performing research in the use of Unmanned Aerial Systems (UAS) to facilitate operations. The UAS technology is dynamic and advancing quickly. UAS have been carrying numerous devices such as HD cameras, HD video cameras, LiDAR imaging equipment, and more. Contractors, Owners, and Consultants are using these devices to assist them in day to day operations as well as researching future uses. Because of its semi-regulated use, challenges do exist to implementation; however, several lead states have been identified whose experience can benefit others in accelerating implementation.

This scan will visit users of this technology and document their specific application: Based upon a AASHTO survey, the following are possible State DOT that should be considered for this visit: Connecticut, Delaware, Florida, Idaho, Indiana, Kentucky, Minnesota, Michigan, Oregon, South Carolina, Vermont, or Washington State. The team should meet with survey, design, inspection, operations and construction staff to assess the effectiveness of the technology and partnering efforts currently being used by the state DOT's, consultants, universities, supplier, and contractors.

Information to be gathered would include but not be limited to:

- Documenting why, how, and where are they are using this technology for inspection, inventory, survey, etc.
- How the data is being stored and used
- What control method is being used (remote control or autonomous).
- What attached devices are being used (i.e. HD cameras, video cameras, LiDAR, etc.)
- Who is the Owner/Operator of the UAS: (agencies, Contractors, Consultants, and/or Universities)
- Costs and realized Benefits
- Barriers, obstacles and opportunities experienced in deployment

The scan focus and objectives shall provide a better understanding of the proactive use of this technology as well as the return on investment and its benefits to the surface transportation community. This scan will assist the accelerated national deployment of the technology by providing "Getting Started" guidance and case studies of successful applications of UAS. The scan will also provide valuable information concerning where additional development and research might be needed to support the increased use of this technology.

Original Scan Proposal Title(s):
Unmanned Arial Systems In Highway Construction And Maintenance
Defining State DOT Needs For Unmanned Aerial Systems For Bridge Condition Assessment

Scan Team Membership

Emanuel Banks – AASHTO Chair
Deputy Director/ Chief Engineer
Arkansas DOT
10324 I-30,
Little Rock, AR 72209
Phone: 501-569-2214
Email: 103ehrooz.banks@ahtd.ar.gov

James Gray
Preservation and Maintenance Engineer
Office of Asset Management, Pavements, and Construction
FHWA, Michigan Div. Off.
Phone: 517-702-1834
Email: James.gray@dot.gov

Amy Tootle
State Construction Engineer, Florida DOT
605 Suwannee Street
Tallahassee, Florida 32399-0450
Phone: 850-414-4364
Email: Amy.Tootle@dot.state.fl.us

Gregg Fredrick
Chief Engineer, Wyoming DOT
Phone: 307-777-4484
Email: Gregg.fredrick@wyo.gov

Troy Larue
Division Operations Manager, Alaska DOT
Phone: 907-269-0730
Email: Troy.larue@alaska.gov

Paul R. Snyder – Co-SME
Director of UAS Program, Assistant Professor
University of North Dakota
Dubuque-Snyder Aviation Consulting
1811 17th St. NE
Grand Forks, N.D. 58203
Phone: 218-791-4161
Email: prsnyder08@gmail.com

Steven J. Cook, P.E.
Engineer of Operations & Maintenance
Michigan Department of Transportation
6333 Lansing Road
Lansing, Mi 48917
Office: 517-636-4094
Email: cooks9@michigan.gov

Paul Wheeler
Technology Advancement Specialist' Utah DOT
4501 South 2700 West,
Salt Lake City, Utah 84129
PO Box 148470,
Salt Lake City, Utah 84114-8470
Phone: 801-965-4700
Phone: 801-633-9998
Email: pwheeler@utah.gov

Zach Waller – Co-SME
Director of Research for the Aviation Department, Assistant Professor
University of North Dakota
Dubuque-Snyder Aviation Consulting
1811 17th St. NE
Grand Forks, N.D. 58203
Phone: (218)-205-0722,
E-mail: zwaller@aero.und.edu

Shayne Gill – AASHTO liaison
Program Director for Multimodal Transportation
American Association of State Highway and Transportation Officials
444 N. Capitol Street, NW, Suite 249
Washington, DC 20001
202-624-3630 Work
Sgill@aashto.org

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	April – May 2017
Desk Scan Completed	December 2017
Prescan Meeting Held	December 2017
Scan Conducted	April 2018
Draft Summary Report submitted by SME	May 2018
Draft Report Delivered to NCHRP and Panel	July 2018
Final Report Delivered to NCHRP	January 2019

Actual Cost and Duration: $ 213,000. This scan was conducted as a workshop.

Last Reviewed/Revised July 16, 2020

NCHRP 20-68 – "US Domestic Scan Program"

Domestic Scan 17-02 Successful Approaches to Accommodate Additional Modes and Services in Existing Right Of Way

State DOTs are increasingly being challenged to accommodate a variety of modes and services within existing right of ways. DOTs may be asked to dedicate (in whole or part) existing lanes or right of way to transit, high occupancy vehicles, bikes, freight or enhanced pedestrian access. The decisions to accommodate the additional modes and services requires a variety of site and community specific trade-offs, design and construction considerations and operational needs that have to be addressed for such accommodation to be accomplished successfully.

This scan will evaluate the design, operational and policy/procedural decisions that State DOTs have been faced with in response to a proposal from an external agency or entity to accommodate additional modes and services within existing ROW. A particular interest is on the dedication of existing lanes to transit as part of a Federal Transit Administration (FTA), Capital Investment Grant (CIG) project especially in urban settings. The scan team will examine technical issues associated with design, construction and operations/maintenance, but will also be strongly focuses on organizational, policy, procedural and "relationship" issues. Examples of key Information to be gathered and shared include:

- Processes and roles for stakeholders for evaluating and approving the use of existing ROW for additional modes.
- Methods and criteria were used by State DOTS to make decisions regarding the impacts on the facility.
- The organizational challenges for agencies involves in the process.
- Arrangements between the State DOT and other agency's involved in maintenance and operational costs
- The community outreach/local consensus building process
- The State DOT's participation in construction oversight for work within their ROW.
- Coordination between federal modal agencies, such as FTA and FHWA.
- Formal and informal agreements between the State DOT and the sponsoring agency.
- Specific design and construction challenges.

There are a number of State DOTs actively involved in accommodating transit projects – including light rail and BRT – in their ROW. Several of the States represented on the SCOP's MMTF have suggested projects that would be excellent sites to visit such as:

- Michigan – Lansing area BRT and Grand Rapids area BRT
- Florida I-95 Express Lanes – Miami-Dade County
- Texas – Dallas Area Rapid Transit | US-75 Integrated Corridor Management (ICM)
- Washington Department of Transportation's I-405 Project, North I-5 Project, I-90 Center Roadway and Lynnwood Link Light Rail
- Minnesota – I-35W and Lake Street, Minneapolis
- Tennessee DOT and the City of Nashville AMP Project – lessons learned
- Utah Transit Authority Provo-Orem Transportation Improvement Project
- San Francisco Municipal Transportation Agency's Van Ness Avenue Bus Rapid Transit (BRT) project
- San Diego Mid-Coast LRT along I-5
- Charlotte, NC – LYNX Gold Line (streetcar) along state-owned N. Tryon St

It is envisioned that this scan will advance the institutional capacity of State DOTs to participate/partner in projects proposed by others to "add" modes to existing ROW, in particular Bus Rapid Transit under the FTA Capital Investment Grants program and provide informal "roadmaps" and case studies to road, transit and other modal agencies as they approach these projects. It will also assist the various AASHTO's Standing Committees to advance the dialogue and capacity of AASHTO members to achieve their multi-modal goals.

Original Scan Proposal Title(s): Accommodating Additional Modes in Existing Right Of Way

Scan Team Membership

Sharon Edgar —AASHTO Chair
Administrator
Office of Passenger Transportation
Michigan Department of Transportation
Direct Line: 517-373-0470
Email: EdgarS@michigan.gov

Willard (Will) Thompson
Manager, Lansing Transportation Services Center
Michigan Department of Transportation
Office: 517-335-3726
Email: thompsonw@michigan.gov

Dylan Counts
Multimodal Access Integration & Safety Manager
Washington State Department of Transportation
Tel: (206)464-1232
Cell: (425)922-5689
Email: Countsd@wsdot.wa.gov

Elizabeth (Beth) Bonini
Acting director of the Office of PennPorts
Pennsylvania Department of Transportation
Office: 717-787-1211
Email: ebonini@pa.gov

Ming Gao
Multi-Modal Systems Administrator, District 7
(Tampa Bay area)
Florida DOT
Phone: 813-975-6454,
Email: Ming.gao@dot.state.fl.us

Scott A. Pedersen, P.E.
Metro District Project Management Manager
Minnesota DOT
1500 West County Road B2
Roseville, Mn. 55113
Phone: 651-234-7726
E-mail: scott.pedersen@state.mn.us

Gary Jensen
Team Leader, Livability Team
Office of Human Environment, HEPH-10
Federal Highway Administration
1200 New Jersey Avenue, SE
Washington, DC 20590
Phone: 202-366-2048
Email: Gary.Jensen@dot.gov

Dennis R. Slimmer - SME
6149 SW Brookfield Cir
Topeka, Kansas 66614-5278
Phone: (785) 845-6598
Email: Dennis.slimmer@gmail.com

Matthew Hardy –AASHTO Liaison
Program Director for Planning and Performance Management
AASHTO
Phone: (202) 624-3625
Email: mhardy@aashto.org

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	April- May 2017
Desk Scan Completed	August 2017
Prescan Meeting Held	August 2017
Scan Conducted	April – May 2018
Draft Summary Report submitted by SME	June 2018
Draft Report Delivered to NCHRP and Panel	August 2018
Final Report Delivered to NCHRP	February 2019

Actual Cost and Duration: $191,000. This scan was conducted as a workshop

NCHRP 20-68 – "US Domestic Scan Program"

Domestic Scan 17-03 Experiences in the Performance of Bridge Bearings And Expansion Joints Used For Highway Bridges

Damage related to bridge deck expansion joints in the United States costs agencies tens of millions of dollars each year. Damaged joints result in acceleration in deck deterioration as well as deterioration to the portion of the bridge beneath the opening that is exposed to debris and contaminants that leak through. Of specific concern below the joint in a bridge are the bridge's bearings. Bridge bearings are required to transmit the loads from the superstructure to the, while permitting the superstructure to undergo necessary movement without developing overstresses. A bearing assembly that is frozen or damaged due to deterioration caused by inadequate joints may overstress the bridge components below resulting in the need to implement an extremely costly repair to insure bridge safety and serviceability.

As little national work has been done in this area in almost 15 years, this scan will facilitate the exchange of recent ideas and best practices for Bridge Bearings and Expansion Joint design, performance evaluation, maintenance and repair/reconstruction. Discussions will include design, construction, maintenance and operations staff of state and other transportation agencies that have experienced good performance of their bridge joints and/or bearings. Details for various bridge types (i.e. materials, span arrangements, geometry) and sizes will be examined.

Topics to be considered by the scan include:

- Design and details, construction specifications and maintenance procedures for durable bearings and expansion joints that have a history of good in-service performance history;
- Visual inspection and other testing of joint and bearing details;
- Specialized technology and standards used in monitoring, inspecting, and repair of joint and bearing details to ensure safety and serviceability with optimal performance and to minimize downtime during bridge construction and rehabilitation; and
- Relative costs for design, construction, maintenance, and inspection of various joint and bearing details.
- Lessons learned and suggestions for improvement.

In deciding on agencies to be visited considerations should be given to the climate challenges of the regions they are located, traffic volume, project size, etc. Based on an initial review of bearing and joint performance it is suggested that the following state DOT's be studied:

1. States with severe climate challenges (cold and freezing conditions) – Illinois, New York and Massachusetts
2. States with considerable precipitation and cold climates – Washington State and Oregon.
3. States very high ADT's on many bridges – California, Texas, & New York
4. Coastal states with large size bridges such as Florida, Virginia, and Louisiana
5. States with success details (Minnesota) and lessons learned to offer (Pennsylvania).

This scan would be of specific interest to the AASHTO Subcommittee on Bridges and Structures Technical Committee T-2 "Bearings and Expansion Devices", the AASHTO Subcommittee on Materials and the AASHTO Subcommittee on Maintenance. The scan report will provide current information on successful expansion joints and bearings to bridge owners. It will also provide valuable information to the AASHTO Committees for future consideration when developing their work plans and research needs. A synthesis of this information would also be of interest to State DOTs and FHWA offices, other Federal and local agencies involved in bridges, bearing and joint manufacturers, university researchers, consultants, county and local DOT's.

Original Scan Proposal Title(s): Performance Of Bearings And Expansion Joints Used For Highway Bridges

Scan Team Membership

Bijan Khaleghi - AASHTO Chair
State Bridge Design Engineer
Washington State DOT
Bridge & Structures Office
P.O.Box 47340
Olympia, WA 98504-7340
Office: (360) 705-7181
Cell: (360) 480-9984
Email: khalegb@wsdot.wa.gov

Rebecca Nix
Bridge Management Engineer
Utah Department of Transportation
4501 South 2700 West,
Salt Lake City, Utah 84129
Phone: 801-965-4879
Phone: 801-633-2810
Email: Rnix@utah.gov

Ahmed N. Mongi, P.E.
QA/QC Unit Leader, In-House Design Section
Division of Highways, Engineering Division
West Virginia DOT
1334 Smith Street
Charleston, WV 25301
Tel: 304.558.9739
Fax: 304.558.0605
Cell: 304.553-3941
Email: Ahmed.N.Mongi@wv.gov

Zhengzheng "Jenny" Fu, P.E.
Assistant Bridge Design Administrator
LADOTD Room 603A
1201 Capitol Access Road
Baton Rouge, LA 70802
Office: 225-379-1321
Cell: 225-938-4669
Email: Zhengzheng.fu@la.gov

Ed Kestory
District Structures Maintenance Engineer
District 5 Bridge Inspection
Florida DOT
1650 North Kepler Road
DeLand, FL 32724
Phone: (386) 740-3450
Mobile: (386) 956-9873
Fax: (386) 736-5469
Email: Ed.Kestory@dot.state.fl.us

Linh Warren, P.E.
Structural Engineer
FHWA Office of Bridges and Structures
HIBS-10 E75-113
1200 New Jersey Ave SE
Washington DC 20590
phone: (202) 366-8501
email: tuonglinh.warren@dot.gov

John F. Stanton, PhD – SME
Professor, Civil and Environmental Engineering
University of Washington
More Hall 214D
Box 352700
Seattle, WA 98195-2700
Phone: 206-543-6057
Email: stanton@u.washington.edu

Jill Walsh, PhD, PE –Technical Consultant
Assistant professor
Saint Martin's University
5000 Abbey Way SE
Lacey, WA 98503
T: 360-688-2744
Email: jwalsh@stmartin.edu

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	July 2017
Desk Scan Completed	November 2017
Prescan Meeting Held	November 2017
Scan Conducted	March 2018
Draft Summary Report submitted by SME	April 2018
Draft Report Delivered to NCHRP and Panel	May 2019
Final Report Delivered to NCHRP	January 2020

Actual Cost and Duration: $ 185,000. This scan was conducted as a workshop.

Last Reviewed/Revised July 16, 2020

NCHRP 20-68 – "US Domestic Scan Program"

Domestic Scan 18-01 – Successful Approaches for the Use of Hydrodemolition For Partial Depth Removal of Bridge Decks

Rehabilitation of bridge decks is a recurring task for almost all agencies responsible for maintaining a road network. The task typically entails disturbance of traffic operations, exposure of workers to active traffic, and environmental remediation. Technology, procedures, and practices that can improve agencies' ability to reduce the time required and associated risks and adverse impacts for deck replacements can have widespread benefits. Several state transportation agencies are finding that hydrodemolition is offering such benefits. Learning and disseminating the lessons of these agencies' experience can accelerate the technology's adoption and support refinement and standardization of practice, particularly with regard to challenges associated with environmental restrictions, water sources, water disposal, and applications to deeper decks.

This scan will meet with users of hydrodemolition and document their specific applications: The team will seek to examine bridges undergoing hydrodemolition as well as bridges that have undergone past hydrodemolition deck replacements to study both the hydrodemolition process and long term performance of bridges that have been subject to a partial deck replacement. The team will explore various aspects of the hydrodemolition process, gathering perspectives of agencies, contractors, and consultants experienced in hydrodemolition. Agencies known to have used of this technology that may be approached for study by the scan team include the Illinois Department of Transportation, Michigan Department of Transportation, New York State Thruway Authority, and Utah Department of Transportation.

The scan will consider information such as the following points:

- Design criteria and details, construction specifications and staged-construction approaches utilized on projects specifying hydrodemolition
- Wastewater permitting, control, collection, reuse or disposal
- Special considerations regarding reinforcement steel location and protection, existing patch materials, other existing or latent field conditions or damage caused by the operation
- Limitations with regard to removal depths, if any
- Preferred overlay materials
- Relative costs for design, construction, maintenance, and inspection of bridges which have been subject to hydrodemolition
- Lessons learned and suggestions for improvement

This scan is anticipated to be conducted as a Type 1- Traveling Scan. The scan report will provide current information on successfully utilizing hydrodemolition to bridge preservations and rehabilitation projects by sharing both successes and lessons learned in planning, designing, specifying, permitting, construction and performance to all agencies considering the use of this technology in their bridge preservation strategies. The scan results are likely to be of interest to several AASHTO committees including the AASHTO Committees on Bridges and Structures, Construction, Maintenance and Materials, and possibly Environment and Sustainability.

Original Scan Proposal Title:

Hydrodemolition For Partial Depth Removal of Bridge Decks

Scan Team Membership

Cheryl Hersh Simmons -AASHTO Chair
Structures Design Manager
Utah DOT
T: 801-964-4463
Email: cherylhersh@utah.gov

Zhengzheng "Jenny" Fu, P.E.
Bridge Design Administrator
Louisiana DOTD
Room 603A
1201 Capitol Access Road
Baton Rouge, LA 70802
Office: 225-379-1321
Cell: 225-938-4669
Email: Zhengzheng.fu@la.gov

John Belcher
Bridge Construction Engineer
Michigan DOT
T: (517) 322- 5673
Email: BelcherJ@michigan.gov

Paul Pilarski
Metro North Region Bridge Engineer
Minnesota Dept of Transportation
Bridge Office – Mail Stop 610
3485 Hadley Avenue North
Oakdale, MN 55128
Office (651) 366-4563
Cell (651) 485-3167
Email: paul.pilarski@state.mn.us

Behrooz Rad, PE
Project Manager
District Department of Transportation
55 M Street SE, Suite 400
Washington, DC 20003
Email: 111ehrooz.rad@dc.gov

DeWayne Wilson PE
Bridge Asset Manager
Washington State DOT
P.O. Box 47340
Olympia, WA 98504-7340
Office: 360.705.7214
Email: WilsonD@wsdot.wa.gov

Xiaohua "Hannah" Cheng, PhD, P.E.
Civil Engineer, Bureau of Structural Engineering
New Jersey Department of Transportation
1035 Parkway Ave,
Ewing Township, NJ 08625
Phone: 609-530-2464
Email: Xiaohua.cheng@dot.nj.gov

Romeo R. Garcia
Bridge Construction Engineer
Office of Infrastructure
Office of Preconstruction, Construction and Pavements
Construction Management Team
HIAP-30, Room E73-473
Federal Highway Administration (FHWA)
1200 New Jersey Avenue, SE
Washington, DC 20590
Phone: 202-366-1342
Email: Romeo.Garcia@dot.gov

Brent Phares, PhD, P.E. – SME
Director, Bridge Engineering Center,
Institute for Transportation
Associate Research Professor, Department of Civil, Construction, and Environmental Engineering, Iowa State University
Advanced Structural, LLC
3012 Sapphire Circle
Ames, IA 50010
T: (515) 201-8676
Email: bphares@iastate.edu

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	July 2018
Desk Scan Completed	November 2018
Prescan Meeting Held	November 2018
Scan Conducted	April – May 2019
Draft Summary Report submitted by SME	June 2019
Draft Report Delivered to NCHRP and Panel	August 2019
Final Report Delivered to NCHRP	January 2020

Actual Cost and Duration: $1813000. This scan was conducted as a workshop.

Last Reviewed/Revised July 16, 2020

NCHRP 20-68 – "US Domestic Scan Program"

Domestic Scan 18-02 - Leading Practices in Modifying Agency Organization And Management To Accommodate Changing Transportation System Technologies

From the perspective of state departments of transportation (DOTs) and other public sector organizations responsible for development and management of surface transportation systems, *transportation systems technologies* refers broadly to operating procedures, procurement methods, and information management, as well as a wide range of hardware, materials, and software. Many of these technologies have been evolving rapidly and some are motivating change in DOT organization and management practices. Some agencies have found, for example, that effective implementation of Transportation Systems Management and Operations (TSMO) strategies requires significantly enhanced communication and coordination among operations, maintenance, and engineering staff. Others are finding that increased availability and reliability of information about roadway and traffic conditions offer opportunities for improving safety and travel times but require changes in their traffic incident management and road-weather management practices. Many observers expect that introduction of connected and automated vehicles (CAV) will continue to motivate organizational and management change.

The scan will investigate how DOTs are changing their organizations, institutional arrangements, and management practices to improve transportation system performance through adoption of new technologies. A diverse scan team—drawn from maintenance, operations, and traffic engineering—will be tasked to review the experience of DOTs or other agencies that have been notably successful in their adoption of new technologies for integrated corridor management, traffic incident management, and road-weather management, to explore the institutional and management changes credited for the success and to extract lessons that can inform other agencies' development.

TSMO is a recent example of changing transportation technology that is influencing organizations. Several states that have created TSMO Divisions or Bureaus within their agencies may provide insights to the scan. These include Arizona, Colorado, Florida, Georgia, Iowa, Maryland, Ohio, Tennessee, Texas and Washington. Other public sector or toll authorities or agencies may provide valuable insights as well.

This scan is anticipated to be conducted as a Type 1- Traveling Scan. The scan report will provide guidance on leading practices for enhancing communications and coordination amongst maintenance, operations, and traffic engineering staff and others, sharing of operational information across the organization and case studies demonstrating these success from agencies that have been successful in establishing organizations that deal effectively with changing transportation technology. The scan results are likely to be of interest to several AASHTO committees including the AASHTO Committees on Traffic Engineering, Construction, Maintenance and Transportation System Operations.

Original Scan Proposal Title:

Institutionalizing Collaboration and Cooperation In Maintenance, Operations, And Traffic Engineering To Support The Transition To New And Emerging Transportation Technologies

Scan Team Membership

Michael Lewis -AASHTO Chair
Previous Executive Director
Colorado DOT
Email: mikelewis1961@gmail.com

Tom Harman
Director, Center for Accelerating Innovation
Federal Highway Administration
Phone: (202) 366-6377
Email: Tom.Harman@dot.gov

Scott Marler
Director, Operations Bureau
Iowa Department of Transportation
800 Lincoln Way
Ames, Iowa 50010
Office 515.239.1205
Email: scott.marler@iowadot.us

John Hibbard
Director, Permits and Operations Division
Georgia DOT
One Georgia Center
600 West Peachtree St NW, 24th Floor
Atlanta, GA 30308
(470) 255-0655
Email: jhibbard@dot.ga.gov

Galen McGill
Manager, Intelligent Transportation Systems
Office of Maintenance and Operations
Highway Division
Oregon Department of Transportation
355 Capitol St NE Room 504
Salem, OR 97301-3871
T: (503) 986-4486
Email: Galen.E.McGill@odot.state.or.us

Gene S. Donaldson
Project Manager
TMC Operations Manager
Delaware DOT
T: 302.659.4601
Email: gene.donaldson@state.de.us

John Nisbet
Director & State Traffic Engineer
Traffic Operations Division
Washington State DOT
T: (360) 705-7280
Email: nisbetj@wsdot.wa.gov

Ron Vessey, PE
State ITS Operations Engineer
Washington State DOT
Office: 360.705.7948
Email: VesseyR@wsdot.wa.gov

Rob Wight
Director for Construction
Utah DOT
Phone: 801-965-4111
Email: rwight@utah.gov

Richard Roman
Director, Bureau of Maintenance and
Operations (BOMO)
Pennsylvania DOT
Phone: (717) 787-2510
Email: RIROMAN@pa.gov

Glenn Blackwelder
Traffic Operations Engineer
Utah DOT
T: 801-518-4180
Email: gblackwelder@utah.gov

William (Bill) Lambert
Administrator/Traffic Engineer, Traffic
Division
New Hampshire DOT
18 Smokey Bear Blvd
PO Box 483
Concord, NH 03302-0483
T: (603) 271-1679
Email: William.Lambert@dot.nh.gov

Anita Bush
Chief Maintenance and Asset Management
Engineer
Nevada DOT
T: 775-888-7856
Email: abush@dot.state.nv.us

Steve Lund
State Maintenance Engineer
Minnesota Department of Transportation
Central Office, Transportation Building
395 John Ireland Boulevard
Saint Paul, MN 55155-1899
T: 651 366-3566
C: 651 230-8986
Email: steven.lund@state.mn.us

Pamela Hutton, P.E. –SME
5293 Lake Gulch Rd
Castle Rock, CO 80104
T: 303-263-1212
Email: Appysandharleys@gmail.com

Marlon Spinks --AASHTO Liaison
AASHTO Engineering Fellow
Email: mspinks@aashto.org

Execution Schedule

Milestone	**Anticipated Date**
Chairs and Team Members Identified	September 2018
Desk Scan Completed	December 2018
Pre-scan Meeting Held	December 2018
Scan Conducted	August 2019
Draft Summary Report submitted by SME	September 2019
Draft Report Delivered to NCHRP and Panel	November 2019
Final Report Delivered to NCHRP	May 2020

Actual Cost and Duration: $183,000. This scan was conducted as a workshop

Last Reviewed/Revised July 16, 2020

NCHRP 20-68 – "US Domestic Scan Program"

Domestic Scan 19-01 Leading Practices for Detailing Bridge Ends and Approach Pavements To Limit Distress and Deterioration

Bridge owners seek to design and construct structures with details and materials that will minimize maintenance and repair costs. One strategy for doing so in design is to minimize the number of joints in the structure. While this approach has proven to improve durability of the structure itself, thermal expansion and contraction of the structure must still be accommodated and loads must be transferred between structural segments when joints are required. Detailing and maintaining joints at bridge ends are notoriously challenging not only because the transition from one structure to another often becomes noticeable to road users as "bump at the end of the bridge," but also because the displacements and forces at these locations are particularly prone to cause damage to riding surfaces and structural elements. Bridge owners have adopted a wide variety of design details to avoid this damage and have sought to understand the causes of observed distress. This scan will seek out leading design and management practices for minimizing structural distress and surface discontinuity on approaches to jointless bridges.

This scan team will meet with agencies having experience in dealing with distresses observed on approaches to jointless bridges and will explore such leading-edge solutions as the Minnesota Department of Transportation's differentiation criteria for the selection of appropriate abutment types based on geometric characteristics, wingwall configurations, abutment height and superstructure beam depth. The team will seek to identify tools that can assist in the selection of the appropriate details for use at the ends of bridges. Sharing of these tools nationwide will improve the performance and durability of jointless bridges. The key information to be gained is the identification of details that have been implemented at the ends of structures that achieve a jointless bridge while minimizing the structure distress, maintenance and repair costs, considering issues and strategies such as

1) Isolating the approach stab from the backfill material beneath it at the end of the bridge to allow for adequate movement.
2) Connections between components at the ends of bridges including, but not limited to bridge decks, abutment backwalls, abutments, abutment foundations, and the approach pavement.
3) End of bridge drainage systems.
4) Structure length, substructure skew, and other geometric characteristics that dictate the use of unique components or details.
5) Supporting design calculations critical to the resolution of issues.
6) Rehabilitation solutions to repair the deterioration and distress associated with the details at the ends of bridges that are not functioning as anticipated.

This scan is anticipated to be conducted as Type 3- Peer Exchange. The scan report will provide current information on successfully detailing jointless bridges by sharing both successes and lessons learned in planning, designing, specifying, permitting, construction and performance to all agencies considering the use of jointless bridges in their bridge design strategies. The audience for this information are state and local bridge design engineers and geotechnical engineers who can use the information to improve the end of bridge details currently in use. The scan results are likely to be of interest to several AASHTO committees including the AASHTO Committees on Bridges and Structures, Construction, Maintenance, Materials and Pavements, and possibly Design.

Original Scan Proposal Title: Best Practices for Detailing Bridge Ends and Approach Pavements To Limit Distress And Deterioration

Scan Team Membership

Jason DeRuyver, P.E. – Team Chair
Engineer Manager
Priority Preservation Support Unit
Structure Preservation
Bureau of Bridges and Structures
6333 Lansing Rd
Lansing, MI 48917
Phone: 517-242-2988
Fax: 517-322-3395
E-mail: DeRuyverJ@michigan.gov

Bijan Khaleghi
State Bridge Design Engineer
Washington State Department of Transportation
Bridge & Structures Office
Olympia, WA 98504-7340
Office: (360) 705-7181
Cell: (360) 522-2846
E-mail: khalegb@wsdot.wa.gov

Adam Lancaster
Bridge standard manager
Louisiana DOTD
Section 25 - Bridge Design, 606D
1201 Capitol Access Rd., 6th floor
Baton Rouge, LA 70802
Phone: (225) 379-1015
E-mail: Adam.Lancaster@LA.GOV

Devan Eaton, P.E.
Project Manager, Bridge Program
Maine DOT
Office: 207-624-3458
Cell: 207-215-5729
Fax: 207-624-3491
E-mail: devan.c.eaton@maine.gov
Ted A. Kniazewycz, P.E.,F.ASCE
Director - Structures Division
Tennessee DOT
T: 615.741.3351
Email: Ted.Kniazewycz@tn.gov

Romeo R. Garcia
Bridge Construction Engineer
Office of Infrastructure
Office of Preconstruction, Construction and Pavements
Construction Management Team
HIAP-30, Room E73-473
Federal Highway Administration (FHWA)
1200 New Jersey Avenue, SE
Washington, DC 20590
Phone: 202-366-1342
Email: Romeo.Garcia@dot.gov

Jill Walsh, PhD, PE - Subject Matter Expert
Assistant professor
Saint Martin's University
5000 Abbey Way SE
Lacey, WA 98503
T: 360-688-2744
Email: jwalsh@stmartin.edu

Execution Schedule

Milestone	**Anticipated Date**
Chairs and Team Members Identified	June 2019
Desk Scan Completed	August 2019
Pre-scan Meeting Held	August 2019
Scan Conducted	November 2019
Draft Summary Report submitted by SME	December 2020
Draft Report Delivered to NCHRP and Panel	June 2020
Final Report Delivered to NCHRP	September 2020

Estimated Scan Cost: $200,000
Anticipated Duration: 1 weeks (type 3 scan)

Last Reviewed/Revised July 16, 2020

NCHRP 20-68 – "US Domestic Scan Program"

Domestic Scan 19-02 Leading Practices in Strategic Workforce Management by Transportation Agencies

AASHTO leadership has identified workforce management as one of the most urgent issues for today's Departments of Transportation (DOTs). DOTs across the nation have increasingly expressed concerns about sustaining a qualified workforce. Many DOTs are addressing this problem by adopting some aspect of strategic workforce management, such as forecasting, succession planning, training and development, or targeted recruitment. This scan will examine innovative strategic workforce management strategies DOTS are implementing, particularly those activities that can be quickly adopted and implemented to recruit, develop, and retain the workforce they need today and for the future.

The scan team will review such examples as the following activities and seek out others that may be exemplary of leading-edge strategic workforce management: Vermont AOT's training program conducted by a fully integrated HR and Civil Rights team, Washington DOT's HR metrics to assess the success of its innovative modern work environment initiative, Virginia DOT's studies of the future transportation workforce, Alaska DOT&PF's evidence-based leadership development program, CalTrans' mentorship efforts, and Missouri DOT's online learning program designed to provide one-stop shopping for employee training needs. Agencies in Delaware; Pennsylvania; Iowa; Idaho; Tennessee, and Minnesota have examples as well.

The scan team will consider common elements of strategic workforce management, such as skills metrics and forecasting, succession planning, employee development, employee wellness and engagement, employee recognition, recruitment, retention, diversity and inclusion, and change management. Outsourcing of functions historically performed within an agency may also be considered. The team must consider agency cultural differences and the context in which the strategic workforce management is applied.

This scan is anticipated to be conducted as a Type 3- Peer Exchange, and is likely to be integrated with other NCHRP activities related to workforce development and knowledge management. .The scan results are likely to be of interest to all of AASHTO committees but particularly to the AASHTO Committees on Agency Administration, Human Resources, Civil Rights, and Knowledge Management, as well as FHWA's Center for Transportation Workforce Development.

Original Scan Proposal Title: Strategic Workforce Management in Transportation

Scan Team Membership

Amanda Holland – Team Chair
Deputy Commissioner,
Department of Administration,
State of Alaska
(907) 465-1233
Email: amanda.holland@alaska.gov

Karen A. Bobo
Director, Center for Transportation Workforce Development
Federal Highway Administration
Office: (202) 366-1333
Cell: (317) 460-0214
Email: Karen.Bobo@dot.gov

Brian Robinson
Deputy Human Resources Director
Georgia DOT
Office of Human Resources
600 W Peachtree St NW
Atlanta, GA 30308
Office: 404.631.1516
Cell: 404.858.0809
Email: BRobinson@dot.ga.gov

John L. Hibbard, P.E.
Operations Division Director
Georgia DOT
600 W. Peachtree St., NW
10th Floor
Atlanta, GA, 30308
Office: 404.631.1401
Cell: 470.225.0655
Email: JHibbard@dot.ga.gov

Kendra M. Campbell, MSIS, PHR, SHRM-CP
Texas Department of Transportation
HRD-Compensation and HRIS Manager
Phone: 512-486-5081
Cell: 512-632-2983
Email: Kendra.Campbell@txdot.gov

Lorri Economy
Chief Learning Officer
Utah Department of Transportation
4501 South 2700 West
PO Box 148460
Salt Lake City, UT 84114
Phone: (435) 632-8756
Email: leconomy@utah.gov

Rob Wight
Operations Director
Utah DOT
Phone: 801-965-4111
Cell: 801-633-6252
Email: rwight@utah.gov

Ashley McGuckin
Chief, Division of Human Resources
Department of Transportation
Cell: (916) 708-7194
Email: ashley.mcguckin@dot.ca.gov

Szandra Keszethelyi
Assistant Division Chief, Human Resources.
California DOT
Phone: (916) 227-7838
Email: Szandra.Keszthelyi@dot.ca.gov

Tammy J Roberts
Project Manager
Leadership Program Review
Safety and Management Services
California Department of transportation
Office: 916-227-3141
Email: tammy.roberts@dot.ca.gov

Craig Crick
Employee Development Manager
Stormwater Division
Nevada Department of Transportation
(775) 888-7819
Email: ccrick@dot.nv.gov

Alexis Martin
Administrator, Bureau of Human Resources
New Hampshire DOT
Room 140, JOM Building
PO Box 483 | 7 Hazen Drive
Concord, NH 03302-0483
T: (603) 271-8313
Email: alexis.martin@dot.nh.gov

William R. Lambert, PE
Traffic Engineer/Administrator
Bureau of Traffic
New Hampshire DOT
P.O. Box 483, 18 Smokey Bear Blvd.
Concord, NH 03302-0483
T: (603) 271-1679
Email: William.Lambert@dot.nh.gov

Lee Wilkinson
Director, Administrative Services Division
Iowa DOT
800 Lincoln Way
Ames, IA 50010
Phone: 515-239-1340
Email: Lee.Wilkinson@iowadot.us

Brian Brown
Deputy Director of Human Resources
Division of Human Resources.

Ohio DOT
1980 W. Broad Street, 1st Floor.
Columbus, OH 43223
Phone: 614-466-5869
Email: Brian.Brown@dot.ohio.gov

Amanda Henry
Strategic HR Business Partner
Maryland SHA
Phone: 410-545-5566
Email: Ahenry@mdot.maryland.gov

Jeremy Gornto
Internal Innovation Consultant
Maryland SHA
Phone: 410-545-5566
Email: Jgornto@mdot.maryland.gov

Rick A. Smith, MSHRM, SPHR -SME
4 Big Oak Street,
Hilton Head Island, SC 29926
Cell: 843-321-3711
Email: rixter2015@gmail.com

Execution Schedule

Milestone	**Anticipated Date**
Chairs and Team Members Identified	July 2019
Desk Scan Completed	September 2019
Pre-scan Meeting Held	September 2019
Scan Conducted	March 2020 – October 2020
Draft Summary Report submitted by SME	November 2020
Draft Report Delivered to NCHRP and Panel	May 2021
Final Report Delivered to NCHRP	August 2021

Estimated Scan Cost: $400,000
Anticipated Duration: 2 weeks (type 3 and type 4 scan)

Last Reviewed/Revised April 14,2021

NCHRP 20-68 – "US Domestic Scan Program"

Domestic Scan 20-01 "Successful Approaches to Utilizing Bridge Management Systems for Strategic Decision Making in Asset Management Plans"

Bridge management systems (BMS), first introduced to help manage bridge inventory and inspection data and to support the National Bridge Inspection Standards (NBIS) In the early 1990s, today continue to provide support for managing bridge inventory and inspection data at both an element level and component level and typically include other functions, such as inspection photo/document management, project tracking, modeling and optimization of maintenance decisions. However, BMS today must operate within the context of the 2012 "Moving Ahead for Progress in the 21st Century" (MAP-21) legislation that requires states to demonstrate that they have pavement and bridge asset management systems as part of more comprehensive Transportation Asset Management Plans. (TAMPs) The legislation defines asset management "as a strategic and systematic process of operating, maintaining, and improving physical assets, with a focus on engineering and economic analysis based upon quality information, to identify a structured sequence of maintenance, preservation, repair, rehabilitation, and replacement actions that will achieve and sustain a desired state of good repair over the lifecycle of the assets at minimum practicable cost."

Despite the advances made over time in BMS, many state DOTs face challenges in developing, implementing and maintaining data-driven, risk- and performance-based management at a system level. While most agencies have succeeded in establishing processes to maintain inventory data and manage the inspection process, many still struggle to utilize their BMS to help support decision-making utilizing available data while considering the risk and performance implications of their investment decisions. There are many different bridge management systems at different levels of maturity, and hence significant variability in how states approach bridge management within the context of the TAMP overall. This scan will help identify common features and approaches being used by agencies to successfully use BMS within the overall transportation asset management context. Particular attention will be given to examination of leading practices for predicting future bridge condition and developing deterioration curves. The Scan Team will investigate agency practices and case studies that illuminate such concerns as (1) data collection and management, (2) performance measure tracking and reporting, (3) use of component- and element-level data to track and forecast bridge condition, (4) usage of BMS data to convey condition information, and (5) agencies' knowledge transfer strategies to sustain staff qualified to operate their BMS.

This scan is anticipated to be conducted as Type 3- Peer Exchange. By documenting and sharing successful practices the scan team will produce a valuable resource for use by agencies in effectively integrating BMS data into their TAMP to successfully improve or preserve the condition of the assets and the performance of their system. The audiences for this information would include AASHTO Committee on Performance-Based Management, Committee on Bridges and Structures, asset management and bridge preservation staff within state, local or other transportation agencies.

Original Scan Proposal Title: Best Practices for Developing, Implementing and Maintaining An Effective Bridge Management System

Scan Team Membership

Chad A. Allen, P.E. – Team Chair
Director
Vermont Agency of Transportation
Asset Management Bureau
219 North Main Street
Barre, VT 05641
802-522-6948 office/cell
Email: Chad.Allen@vermont.gov

Kevin Marshia
Vermont Agency of Transportation
(802) 279-3594
Email: kevin.marshia@vermont.gov

Richard W. Runyen, P.E.
Section Chief
Pennsylvania Department of Transportation
Bureau of Maintenance and Operations
Asset Management Division
Bridge Inspection Section
400 North Street, 6th Floor
Harrisburg, PA 17120
Office: 717.783.5006
Cell: 717.903.2462
Email: rrunyen@pa.gov

Chester Kolota, P.E.
Maine DOT
Bridge Management Engineer
Results and Information Office
16 State House Station
Augusta, ME 04333
phone: 207-624-3535 office
phone: 207-441-8862 mobile
Email: Chester.C.Kolota@maine.gov

Paul Vaught
Louisiana DOTD
Bridge Design Section
Phone: (225) 379-1816
Email: paul.vaughtiii@la.gov

Eric Christie
Deputy State Maintenance Engineer
1409 Coliseum Boulevard
Montgomery, AL 36110
(334) 242-6281 (office)
(334) 8502697 (cell)
christiee@dot.state.al.us

C. Todd Springer, P.E.
Program Manager
Bridge Maintenance and Management
Program Area
Central Office, Structure & Bridge Division
804.786.7537 (O)
804.921.7187 (C)
Todd.Springer@VDOT.Virginia.gov

Felix Padilla
State Bridge Inspection Engineer, Structure
Operation Section
Florida DOT
(850) 410-5516)
605 Suwannee Street, MS 33
Tallahassee, FL 32399
P: 850-414-4306
C: 518-229-1152
felix.padilla@dot.state.fl.us

Scott Neubauer, P.E.
Bridge Maintenance And Inspection Engineer
Bridges and Structures Bureau
Iowa DOT
Office: 515-239-1165
Cell: 515-290-6327
Email: Scott.Neubauer@iowadot.us

Rebecca Curtis
Bridge Management Engineer
Michigan DOT
425 West Ottawa St
PO Box 30050
Lansing, MI 48909
Phone: 517-449-5243
Email: curtisr4@michigan.gov

Edward Lutgen
State Bridge Construction and Maintenance Engineer.
Minnesota DOT
Phone 651-366-4507
Email: edward.lutgen@state.mn.us

Mike Johnson
State Asset Management Engineer
California Department of Transportation (CALTRANS)
Office: 916.653.2572
Email: michael.b.johnson@dot.ca.gov

DeWayne Wilson, P.E.
Bridge Asset Management Engineer
Washington State DOT
Teleworking
Cell 360-867-8235
WilsonD@wsdot.wa.gov

Nancy Huether
Structure Management Engineer/Team Lead
North Dakota DOT
nmhuether@nd.gov

Derek Constable
Bridge Management Engineer
FHWA - Office of Bridges & Structures
HIBS-30, Room E73-125
1200 New Jersey Ave, SE
Washington, D.C. 20590
Phone: 202-366-4606
Email: derek.constable@dot.gov

Başak Bektaş, Ph.D. - SME
Assistant Professor of Civil Engineering
Minnesota State University, Mankato
205 Trafton Science Center East, TE 321
Mankato, MN 56001
Phone: 507-389-1467
Email: bashakbektash@gmail.com

Execution Schedule

Milestone	**Anticipated Date**
Chairs and Team Members Identified	April 2020
Desk Scan Completed	September 2020
Pre-scan Meeting Held	September 2020
Scan Conducted	March 2021
Draft Summary Report submitted by SME	April 2021
Draft Report Delivered to NCHRP and Panel	June 2021
Final Report Delivered to NCHRP	September 2021

Estimated Scan Cost: $200,000
Anticipated Duration: 1 weeks (type 4 scan)

Last Reviewed/Revised April 14, 2021

NCHRP 20-68 – "US Domestic Scan Program"

Domestic Scan 20-02 - "Successful Approaches for Facilitating Truck Parking Accommodation Along Major Freight Corridors"

Lack of adequate accommodation for truck parking along major freight corridors continues to be a critical issue for state transportation agencies. Truck parking at many state-provided safety rest areas and weigh stations routinely exceeds capacity, often leaving truck drivers without reliable options for safely taking rest periods when they are tired or legally required to do so. Drivers may resort to parking on highway ramps, shoulders, or other unsafe areas, creating hazardous situations for the truck drivers and other road users. In a recent FHWA survey of states as part of the implementation of Jason's Law, 36 state DOTs (72%) responded that they "have a problem with commercial vehicle truck parking." Nearly 59% of the states noted problems in public rest areas and over 45% acknowledged they had issues on freeway ramps and shoulders. Many survey respondents cited ability to share information with drivers about where parking is available as an issue of concern.

Several states have initiatives underway to address this situation. The I-10 Corridor Coalition is in the process of implementing a multistate truck parking availability system funded in part by FHWA's Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) Program. Florida is installing a Truck Parking Availability System along several interstate freight corridors. Colorado has undertaken a comprehensive truck parking information strategy including a Truck Parking Management System on East 1-70.

Scan participants will seek a better understanding of the process for developing a truck parking information system along with a successful strategies employed by leading agencies, candidate technologies that might be considered to support sharing parking availability, and case studies of systems that may be transferable to other agencies. Additionally, the scan will focus on and produce potential strategies for issues such as monitoring, ITS design, overcoming legal barriers, and potential funding mechanisms. The key audience for the scan report will be DOT executive and technical staff in freight, planning, design, revenue, ITS, and facilities, but also should be shared with interested outside parties including, FHWA, FMCSA, state patrols, academia, and others.

The scan is envisioned to be conducted as a Type 3 Scan (Peer Exchange). The scan will be a strong tool for transportation agencies, partners, and the public by sharing successful strategies, emerging practices and lessons learned that will help them to address truck parking issues along major freight corridors within their jurisdictions. It will also assist the various AASHTO's Committees, FHWA and industry to advance the dialogue on partnering opportunities that can contribute to addressing this issue.

Original Scan Proposal Title: Implementing Reservation System Technologies for Truck Parking at State Facilities

Scan Team Membership

Jason Beloso – Team Chair
Rail, Freight and Ports Strategic Planning Manager
Freight Systems Division
Washington State DOT
310 Maple Park Ave SE
Room 3D03
Olympia, WA 98504
Office: 206-464-1259
Cell: 831-521-7669
Email: BelosoJ@wsdot.wa.gov

Mauricio Garcia-Theran
Lead freight planner
Office of Strategic Planning and Projects
Bureau of Policy and Planning
Connecticut Department of Transportation
Email: Mauricio.Garcia-Theran@ct.gov

Andrew Ludasi
Division of Multimodal Services
New Jersey DOT
T: 609.963.2086
Email: Andrew.Ludasi@dot.nj.gov

Adam Moncivaez
Traffic Operations Division
James K. Polk Building,18th Floor
505 Deaderick Street, Nashville, TN 37243
Tennessee DOT
p. 615-741-5368
c. 615-801-3460
Email: Adam.Moncivaez@tn.gov

Erik Johnson
Freight Planner
Virginia DOT
(804) 371-0811
E-mail: erik.johnson@vdot.virginia.gov

Randall Hoyt
Freeway Operations Engineer
Wisconsin Department of Transportation
433 West St. Paul Ave.
Suite 300
Milwaukee, WI 53203-3007
(414) 227-4671
Email: randall.hoyt@dot.wi.gov

Caroline A Mays, AICP
Director, Freight, Trade, and Connectivity Section
118 E. Riverside Dr.
Austin, Texas 78704
Office: 512-936-0904
Cell: 512-658-2436
Email: caroline.mays@txdot.gov

Craig Hurst
Freight Office Manager
Colorado DOT
Email: craig.hurst@state.co.us

Tiffany Julien
Freight Management And Operations
Office of Operations
Federal Highway Administration
T: 202-366-9241
Email: Tiffany.Julien@dot.gov

Richard Dunne, P.E. -SME
National Director Bridge Preservation
GPI
100 Corporate Drive, Suite 301,
Lebanon, NJ 08833
d +1 (908) 287-2678
c +1 609-468-7051
Email: rdunne@gpinet.com

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	April 2020
Desk Scan Completed	November 2020
Pre-scan Meeting Held	November 2020
Scan Conducted	May 2021
Draft Summary Report submitted by SME	June 2021
Draft Report Delivered to NCHRP and Panel	August 2021
Final Report Delivered to NCHRP	December 2021

Estimated Scan Cost: $200,000
Anticipated Duration: 1 weeks (type 4 scan)

Last Reviewed/Revised April 14, 2021

NCHRP 20-68 – "US Domestic Scan Program"

Domestic Scan 21-01 Lessons of Agency Resilience During Periods of Disruption

The onset and progress of the global COVID-19 pandemic have presented unprecedented challenges to state transportation agencies. Often changing public health precautions and guidelines, high absenteeism due to illness, fear and anxiety within agency and contractor workforces and the public generally, supply shortages, and economic instability and sudden changes in travel demand, and reduced revenues were among the more visible disruptions to "normal" operations. More subtle challenges arose from coping with telework, public demands for increased safety measures, and construction seasons with lighter than usual vehicle traffic. Throughout the experience agencies have learned valuable lessons and many have found innovative ways to maintain their operations and productivity.

Anecdotal evidence from agencies in Washington State, Virginia, Vermont, Texas, Minnesota, Idaho, Georgia, and others indicates that the experiences gained in dealing with the pandemic disruptions may be useful to other agencies and in the preparing for and responding to future disruptions stemming from public health concerns or other sources. Technology played a key role in some instances, while others illustrate the value of flexible staffing policies, workforce adaptability, and effective leadership. The objective of this scan is to document agency experiences and the lessons learned that can ensure and facilitate agency resilience to maintain efficiency and effectiveness during disruption and post-event recovery, as well as agency preparedness for future disruptions.

The scan team will seek to identify the most innovative and beneficial elements of practice adopted by state transportation agencies to maintain their productivity and system performance, particularly as those activities have enhanced agency resilience and are likely to strengthen agencies' adaptability if confronted by future disruptions. The scan will investigate such key factors as remote work policies and arrangements, use and configuration of physical workplace, continuity of services and prioritization of work, use and incorporation of technology; productivity and performance management, employee engagement, remote training and learning, communications, and leadership and culture.

This scan is being planned as a Virtual Peer Exchange (Type 4). . The scan will entail compilation of lessons learned by each participating agency and effective practices that can comprise a "toolbox" of resources that agencies can adapt for their own use. The scan's audience includes CEOs, department leadership, supervisors, and managers; strategic planners, and human resources and emergency response personnel. The scan results are likely to be of interest to all of AASHTO's committees but particularly to the AASHTO Executive Committee and several Committees in the Agency Administration, Program Delivery and Operations and Enterprise/Cross Discipline areas.

Original Scan Proposal Title: Agency Resilience During Periods of Disruption

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	May 2021
Desk Scan Completed	August 2021
Pre-scan Meeting Held	August 2021
Scan Conducted	November/December 2021
Draft Summary Report submitted by SME	January 2022
Draft Report Delivered to NCHRP and Panel	April 2022
Final Report Delivered to NCHRP	August 2022

Estimated Scan Cost: $150,000
Anticipated Duration: 1 weeks (type 4 scan)

Last Reviewed/Revised April 14, 2021

NCHRP 20-68 – "US Domestic Scan Program"

Domestic Scan 21-02 Leading Approaches to Implementing Context-Based Classification of Roadways in Planning and Design

The recently released 7th edition of the AASHTO "A Policy on Geometric Design of Highways and Streets (Green Book)" introduced the concept of context-based classification of roadways, intended to ensure that roadway designs are appropriate for the settings in which they are built and operated. The new guidance introduced a broader set of land-use context classifications (including rural, rural town, suburban, urban, and urban core) to better match design solutions to specific contexts and provide flexibility in developing project scopes with traditional functional classifications of roadways (local roads and streets, collectors, arterials, and freeways).

The Green Book does not present specific methodologies or parameters for applying the new context classifications. Some agencies seeking to take advantage of the flexibility made possible by these new classifications (for example Florida, New York, Connecticut, and the State of Washington) have implemented context classification in their own design guidance. The objective of the scan is to describe the experiences gained in such leading states and lessons learned that may be valuable to others who have not yet implemented context-based classification.

The scan will investigate a number of key questions:

- In developing a project when is context classification determined?
- Is Context Classification of roadways be done on a state-wide, corridor, or project basis?
- What factors are considered in defining the context of a particular roadway?
- Is context based on current or anticipated future conditions?
- What agency staff is involved in context classification decision making?
- What criteria is used for design exceptions within the determined context classification?
- What flexibility in design do designers have for differing context classifications?
- How are multi-modal considerations (e.g., bike-ped, transit) incorporated in projects?
- Does Context Classifications allow the flexibility for seasonal or special events? (e.g., outside dining, seasonal tourism sites, festivals)?

The scan is planned to be conducted as a virtual peer exchange (Type 4 Scan). In addition to providing an opportunity to document and compare how leading states have implemented Context-Based Classification within their jurisdictions, the scan should encourage a more uniform implementation of guidance across the country and allow for a common language to develop nationwide, promoting greater cooperation and sharing among practitioners. The scan also will provide information for the AASHTO Committee on Design to consider in the development of the next version of the Green Book.

Original Scan Proposal Title: Implementation of Context Classification of Roadways

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	May 2021
Desk Scan Completed	August 2020
Pre-scan Meeting Held	August 2020
Scan Conducted	December 2021
Draft Summary Report submitted by SME	January 2022
Draft Report Delivered to NCHRP and Panel	April 2022
Final Report Delivered to NCHRP	August 2022

Estimated Scan Cost: $150,000
Anticipated Duration: 1 weeks (type 4 scan)

Last Reviewed/Revised April 14, 2021

NCHRP 20-68 – "US Domestic Scan Program"

Domestic Scan 21-03 Successful Approaches to Setting Project Development Budgets

A perpetual challenge facing state transportation agency planners formulating the state's transportation capital program is developing a reliable project development budget for each candidate project. While years of experience and analytical tools inform estimation of projects' construction costs, current practices for estimating costs of internal staff salaries and external consultant services for pre-construction activities such as scope development, environmental documentation, site investigation and analyses, preliminary engineering and plan development, public engagement, and project management tend to be much more susceptible to uncertainty and therefore much less reliable. The uncertainties and unreliability of estimates can have substantial impact of an agency's ability to communicate effectively with stakeholders and decision-makers, as well as to ensure that budgets can be met and capital program's formulated to yield the greatest benefit for available resources.

Some agencies are viewed by their peers as having developed more successful procedures for setting project development budgets, for example Georgia Maine, Minnesota, Nevada, and Utah. The objective of this scan is to document the experience of such leading agencies and extract lessons that may be adapt to other agencies and applied to direct further improvements of budget estimation practices nationwide.

This scan team will examine how project development budgets are set for activities occurring during a project's development phase, such as the NEPA clearance process, surveys, preliminary traffic studies, preliminary engineering analyses and design, preliminary plan preparation, associated project management, site investigations, and the right-of-way acquisition process. Projects funded by government programs as well as innovative funding strategies (e.g., PPP, Design-build, DBOM) will be examined.

Key factors to be investigated include:

- How agencies address budgeting project development
- tasks/elements are included in the pre-construction budget
- Process for final project scope development and approval (including budget)
- construction project size impact the approach to setting project development budgets?
- Approach to addressing pre-construction risks in the process
- Assessment of accuracy of budgets developed using agency practice and Lessons
- Comparison of practices of public and toll agencies

The scan is envisioned to be conducted as a virtual peer exchange (Type 4). It will provide an opportunity to examine how leading states have been successful in providing accurate total capital investment project cost estimates. This will provide stakeholders and decision-makers an accurate picture of the true cost of a project allowing a more informed decision regarding a proposed project. The scan will provide significant information for the AASHTO Committee on Design, Committee on Planning and the Council on Highways and Streets.

Original Scan Proposal Title: Tools, Methods, and Strategies for Setting Project Development Budgets – U.S. Best Practices

Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	May 2021
Desk Scan Completed	August 2020
Pre-scan Meeting Held	August 2020
Scan Conducted	December 2021
Draft Summary Report submitted by SME	January 2022
Draft Report Delivered to NCHRP and Panel	April 2022
Final Report Delivered to NCHRP	August 2022

Estimated Scan Cost: $150,000
Anticipated Duration: 1 weeks (type 4 scan)

Last Reviewed/Revised April 14, 2021