

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

Prospectus & Status of Programmed Scans—April 17, 2017

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.

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NCHRP 20-68A – “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

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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 PowerPoint 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.

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NCHRP 20-68A – “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

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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 PowerPoint 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 20-68A – “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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Execution Schedule

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Chairs and Team Members Identified	July, 2008
Desk Scan Completed	October, 2008
Prescan Meeting Held	October, 2008
Scan Conducted	March-April, 2008
Draft PowerPoint submitted by SME	June, 2009
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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.

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NCHRP 20-68A – “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

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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 PowerPoint 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 20-68A – “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

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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
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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 20-68A – “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

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Milestone	Anticipated Date
Chairs and Team Members Identified	December, 2008
Desk Scan Completed	March, 2009
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Scan Conducted	June, 2009
Draft PowerPoint 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 20-68A – “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

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Desk Scan Completed	February, 2009
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Scan Conducted	November, 2009
Draft PowerPoint 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 20-68A – “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

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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 PowerPoint submitted by SME	September, 2009
Draft Report Delivered to NCHRP and Panel	October, 2009
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Estimated Scan Cost and Funding

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

Last Reviewed/Revised October 26, 2010

NCHRP 20-68A – “US Domestic Scan Program”

Scan 08-04 Best Practices in Work Zone Assessment, Data Collection and Performance Measurements

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

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Desk Scan Completed	November, 2009
Prescan Meeting Held	November, 2009
Scan Conducted	March, 2010
Draft PowerPoint 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 20-68A – 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

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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 PowerPoint 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

NCHRP 20-68A – US Domestic Scan Program

Scan 09-02 Best Practices in Project Delivery Responding to Sudden Program Acceleration

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 PowerPoint 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

NCHRP 20-68A – US Domestic Scan Program

Scan 09-03 Best Practices In Solutions for Lane Departure Avoidance and Traffic Calming

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

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Desk Scan Completed	August, 2010
Prescan Meeting Held	August, 2010
Scan Conducted	November-December, 2010
Draft PowerPoint 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

NCHRP 20-68A – US Domestic Scan Program
Scan 09-04 Best Practices In Successful Strategies for Motorcycle Safety

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

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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 PowerPoint 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

NCHRP 20-68A – US Domestic Scan Program

Scan 09-05 Best Practices For Roadway Tunnel Design, Construction And Maintenance

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

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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 PowerPoint 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

NCHRP 20-68A – US Domestic Scan Program

Scan 10-01 Best Practices for Risk-Based Forecasts of Land Volatility for Corridor Management and Sustainable Communities

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

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Execution Schedule

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Chairs and Team Members Identified	February 2011
Desk Scan Completed	July 2011
Prescan Meeting Held	July 2011
Scan Conducted	October-November 2011
Draft PowerPoint 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

NCHRP 20-68A US Domestic Scan Program

Scan 10-02 Best Practices for Addressing Access and Parking Needs of Non-Resident Users of Rail and Intermodal Transportation Stations in Transit-Oriented Developments

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

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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 PowerPoint 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.

Last Reviewed/Revised October 9, 2014

NCHRP 20-68A US Domestic Scan Program

Scan 10-03 Best Practices in Performance Measuring for Highway Maintenance and Preservation

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

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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 PowerPoint 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 20-68A 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

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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 PowerPoint 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

NCHRP 20-68A – “US Domestic Scan Program”

Scan 11-01 Leading Practices in Large-Scale Outsourcing and Privatization of Maintenance Functions

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 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.

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Milestone	Anticipated Date
Chairs and Team Members Identified	February 2012
Desk Scan Completed	May 2012
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Scan Conducted	August 2012
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Draft Report Delivered to NCHRP and Panel	October 2013
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Estimated Scan Cost and Funding

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

Last Reviewed/Revised October 9, 2014

NCHRP 20-68A – “US Domestic Scan Program”

Scan 11-02 Best Practices Regarding Performance of ABC Connections in Bridges Subjected To Multi-Hazard and Extreme Events

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

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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 PowerPoint submitted by SME	June, 2012
Draft Report Delivered to NCHRP and Panel	October, 2012
Final Report Delivered to NCHRP	July, 2013

Estimated Scan Cost and Funding

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

Last Reviewed/Revised October 9, 2014

NCHRP 20-68A – “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

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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 PowerPoint submitted by SME	January 2014
Draft Report Delivered to NCHRP and Panel	March 2014
Final Report Delivered to NCHRP	October 2014

Estimated Scan Duration and Funding:

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

Last Reviewed/Revised July 22, 2016

NCHRP 20-68A – “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

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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 PowerPoint submitted by SME	August 2014
Draft Report Delivered to NCHRP and Panel	October 2014
Final Report Delivered to NCHRP	March 2015

Estimated Scan Cost and Funding

Actual Cost and Duration: \$200,000; 2 weeks

Last Reviewed/Revised July 22, 2016

NCHRP 20-68A – “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

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Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	March 2013
Desk Scan Completed	August 2013
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Scan Conducted	March-April 2014
Draft PowerPoint submitted by SME	May 2014
Draft Report Delivered to NCHRP and Panel	September 2014
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Estimated Scan Cost and Funding

Actual Cost and Duration: \$222,000; 2 weeks

Last Reviewed/Revised July 22, 2016

NCHRP 20-68A – “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

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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 PowerPoint submitted by SME	December 2013
Draft Report Delivered to NCHRP and Panel	February 2014
Final Report Delivered to NCHRP	October 2014

Estimated Scan Cost and Funding

Actual Cost and Duration: \$157,000; This scan was conducted as a workshop

Last Reviewed/Revised July 22, 2016

NCHRP 20-68A – “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

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Milestone	Anticipated Date
Chairs and Team Members Identified	July 2014
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Scan Conducted	March 2015
Draft PowerPoint submitted by SME	April 2015
Draft Report Delivered to NCHRP and Panel	August 2015
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Estimated Scan Cost and Funding

Actual Cost and Duration: \$159,000; This scan was conducted as a workshop

Last Reviewed/Revised July 22, 2016

NCHRP 20-68A – “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

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Execution Schedule

Milestone	Anticipated Date
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Scan Conducted	July – August 2014
Draft PowerPoint submitted by SME	September 2014
Draft Report Delivered to NCHRP and Panel	November 2014
Final Report Delivered to NCHRP	August 2016

Estimated Scan Cost: \$150,000

Actual Duration: 2 weeks

Last Reviewed/Revised July 22, 2015

NCHRP 20-68A – “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

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Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	August 2014
Desk Scan Completed	October 2014
Prescan Meeting Held	October 2014
Scan Conducted	June - July 2015
Draft PowerPoint submitted by SME	August 2015
Draft Report Delivered to NCHRP and Panel	August 2016
Final Report Delivered to NCHRP	March 2017

Estimated Scan Cost: \$170,000

Anticipated Duration: 2 weeks

Last Reviewed/Revised March 7, 2017

NCHRP 20-68A – “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

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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 PowerPoint submitted by SME	November 2015
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Final Report Delivered to NCHRP	August 2016

Estimated Scan Cost: \$170,000

Actual Duration: 2 week (type 2 scan)

Last Reviewed/Revised March 7, 2017

NCHRP 20-68A – “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

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Execution Schedule

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Last Reviewed/Revised March 7, 2017

NCHRP 20-68A – “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

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Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	July 2014
Desk Scan Completed	November 2014
Prescan Meeting Held	November 2014
Scan Conducted	May 2015
Draft PowerPoint submitted by SME	June 2015
Draft Report Delivered to NCHRP and Panel	August 2015
Final Report Delivered to NCHRP	June 2016

Estimated Scan Cost and Funding

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

Last Reviewed/Revised July 22, 2016

NCHRP 20-68A – “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

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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 PowerPoint submitted by SME	November 2016
Draft Report Delivered to NCHRP and Panel	February 2017
Final Report Delivered to NCHRP	May 2017

Estimated Scan Cost: \$150,000

Anticipated Duration: 1 week (type 3 scan)

Last Reviewed/Revised March 7, 2017

NCHRP 20-68A – “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

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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 PowerPoint submitted by SME	August 2016
Draft Report Delivered to NCHRP and Panel	March 2017
Final Report Delivered to NCHRP	June 2017

Estimated Scan Cost: \$170,000

Anticipated Duration: 1 week (type 3 scan)

Last Reviewed/Revised March 7, 2017

NCHRP 20-68A – “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 approaches 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

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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 PowerPoint submitted by SME	June 2016
Draft Report Delivered to NCHRP and Panel	December 2016
Final Report Delivered to NCHRP	April 2017

Estimated Scan Cost: \$170,000
 Anticipated Duration: 1 week (type 3 scan)

Last Reviewed/Revised March 7, 2017

NCHRP 20-68A – “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

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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 PowerPoint submitted by SME	December 2017
Draft Report Delivered to NCHRP and Panel	March 2018
Final Report Delivered to NCHRP	June 2018

Estimated Scan Cost: \$175,000

Anticipated Duration: 2 weeks (type 2 scan)

Last Reviewed/Revised March 7, 2017

NCHRP 20-68A – “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

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

Estimated Scan Cost: \$175,000
 Anticipated Duration: 2 weeks (type 2 scan)

Last Reviewed/Revised March 7, 2017

NCHRP 20-68A – “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 Aerial Systems In Highway Construction And Maintenance

Defining State DOT Needs For Unmanned Aerial Systems For Bridge Condition Assessment

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Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	April - May 2017
Desk Scan Completed	October 2017
Prescan Meeting Held	October 2017
Scan Conducted	March 2018
Draft PowerPoint submitted by SME	April 2018
Draft Report Delivered to NCHRP and Panel	June 2018
Final Report Delivered to NCHRP	October 2018

Estimated Scan Cost: \$175,000
Anticipated Duration: 1 week (type 3 scan)

Last Reviewed/Revised May 16, 2017

NCHRP 20-68A – “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

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Execution Schedule

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Chairs and Team Members Identified	April- May 2017
Desk Scan Completed	September 2017
Prescan Meeting Held	October 2017
Scan Conducted	March-April 2018
Draft PowerPoint submitted by SME	April-May 2018
Draft Report Delivered to NCHRP and Panel	June-July 2018
Final Report Delivered to NCHRP	October-November 2018

Estimated Scan Cost: \$175,000
Anticipated Duration: 1 week (type 3 scan)

Last Reviewed/Revised May 16, 2017

NCHRP 20-68A – “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

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Execution Schedule

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Chairs and Team Members Identified	July 2017
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Anticipated Duration: 1 week (type 3 scan)

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