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

Prospectus & Status of Programmed Scans—*July 17, 2009*

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 sacn. 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 is 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

Last Revised April 28, 2008

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Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	July, 2008
Desk Scan Completed	October, 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	June, 2009
Final Report Delivered to NCHRP	August, 2009

Estimated Scan Cost and Funding

Estimated cost: and duration: $ 66,600, 1.5 week
FHWA is providing $45,000.

Last Revised March 13, 2009

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

Last Revised April 28, 2008

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Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	July, 2008
Desk Scan Completed	October, 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	August, 2009

Estimated Scan Cost and Funding

Estimated cost: and duration: $ 65,700; 2 weeks
FHWA is providing $25,000.

Last Revised January 29, 2009.

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

Last Revised April 28, 2008

Scan Team Membership

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Execution Schedule

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

Estimated Scan Cost and Funding

Estimated cost: and duration: $ 73,600; 2 weeks
FHWA is providing $50,000.

Last Revised April 20, 2009

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

Last Revised April 28, 2008

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Execution Schedule

Note: This scan is deferred pending completion of the synthesis study *NCHRP 20-05/Topic 41-07 Operational and Institutional Agreements that Facilitate Regional Traffic Signal Operations.*

Milestone	Anticipated Date
Chairs and Team Members Identified	April, 2009
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

Estimated Scan Cost and Funding

Estimated cost: and duration: $ 80,000; 2 week
Anticipated funds from FHWA : $ 25,000

Last Revised July 17, 2009

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 Revised April 28, 2008

Scan Team Membership

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Execution Schedule

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

Estimated Scan Cost and Funding

Estimated cost: and duration: $ 80,000; 2 week

Last Revised January 29, 2009

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 Revised April 28, 2008

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Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	January, 2009
Desk Scan Completed	March, 2009
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Estimated Scan Cost and Funding

Estimated cost: and duration: $ 80,000; 2 week
Anticipated fund from FHWA: $25,000

Last Revised March 10, 2009

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 Revised April 28, 2008

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Execution Schedule

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

Estimated Scan Cost and Funding

Estimated cost: and duration: $ 80,000; 2 week
Anticipated fund from FHWA: $ 25,000

Last Revised April 20, 2009

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 Revised April 28, 2008

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Execution Schedule

Milestone	Anticipated Date
Chairs and Team Members Identified	January, 2009
Desk Scan Completed	March, 2009
Prescan Meeting Held	March, 2009
Scan Conducted	July, 2009
Draft PowerPoint submitted by SME	August, 2009
Draft Report Delivered to NCHRP and Panel	October, 2009
Final Report Delivered to NCHRP	December, 2009

Estimated Scan Cost and Funding

Estimated cost: and duration: $ 80,000; 2 week

Last Revised July 6, 2009

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 Revised April 28, 2008

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Execution Schedule

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

Estimated Scan Cost and Funding

Estimated cost: and duration: $ 80, 000; 2 week
Anticipated fund from FHWA: $ 50,000 ($45,000 for scan expenses)

Last Revised July 17, 2009

NCHRP 20-68A – US Domestic Scan Program

Scan 09-01 Best Practices in Quality Control/Quality Assurance (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 Revised January 29, 2009

Scan Team Membership

(To Be Determined)

Execution Schedule

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

Estimated Scan Cost and Funding

Estimated cost and duration: $ 80,000; 2 week

Last Revised July 17, 2009

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	November, 2009
Desk Scan Completed	January, 2010
Prescan Meeting Held	January, 2010
Scan Conducted	March, 2010
Draft PowerPoint submitted by SME	April, 2010
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Estimated Scan Cost and Funding

Estimated cost and duration: $ 80,000; 2 week

Last Revised July 17, 2009

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 Revised January 29, 2009

Scan Team Membership

(To Be Determined)

Execution Schedule

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

Estimated Scan Cost and Funding

Estimated cost and duration: $ 80,000; 2 week

Last Revised July 17, 2009

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

1. Successful Strategies for Motorcycle Safety

Last Revised January 29, 2009

Scan Team Membership

(To Be Determined)

Execution Schedule

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

Estimated Scan Cost and Funding

Estimated cost: and duration: $ 60,000; 1 week

Last Revised July 17, 2009

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 Revised January 29, 2009

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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	December, 2009
Final Report Delivered to NCHRP	February, 2010

Estimated Scan Cost and Funding

Estimated cost: and duration: $ 80,000; 2 week
Anticipated fund from FHWA: $25,000

Last Revised April 20, 2009