Domestic Scan Proposal Form

AASHTO is now soliciting proposals for the **US Domestic Scan Program** (NCHRP Panel 20-68A).

Selected scan topics will be investigated by one of three ways: (type 1) site visits to three to six locations for approximately a two week period or less, by webinar; (type 2) peer exchange; or (type 3) conducted by a group of eight to 12 transportation professionals with expertise in the selected topic area. Proposed topics should meet the following criteria:

* Address an important and timely need for information by transportation agencies;
* Are of interest to a broad national spectrum of people and agencies;
* Are complex and also “hands-on,” meaning they lend themselves particularly well to exploration through on-site visits; and
* Are sufficiently focused that the tour participants are able to investigate and understand key issues in the limited time available on the tour.

Before submitting your proposal it is highly recommended that you read **What Makes a Good Scan Topic Proposal** [**http://www.domesticscan.org/what-makes-a-good-scan-topic-proposal**](http://www.domesticscan.org/what-makes-a-good-scan-topic-proposal)

This form is designed to collect the full length of your proposal. Sections requiring essays have unlimited space for you to use. Contact information has some limited text. ***Click on the highlighted boxes to advance to the area where you need to complete information.***

# Proposals should be returned no later than date list on NCHRP website.

**IMPORTANT NOTE on How to save your document**: ***LastNameFirst Initial, underscore\_Organization Acronym \_CY2021 Saved Document Name Example: NgetheP\_AASHTO\_CY2021***

***If you have more than one, add a number after first initial: NgetheP1\_AASHTO\_CY2021***

# Domestic Scan Proposal Contact Information

**Name** Bijan Khaleghi, PhD, PE, SE **Address** 7345 Linderson Way SW, Tumwater, WA 98501

**Title** State Bridge Design Engineer **E-mail** khalegb@wsdot.wa.gov

**Agency/Member Department**

Washington State DOT

**AASHTOCommittee**

T-4, T-9, T-10, T-18

**Telephone number** 3605222846

**Date of submission**

 10/30/2021

[ ] Please **check** this box if your proposal has been endorsed or is being requested through an AASHTO Committee. List the AASHTO Committee(s) that endorsed this proposal: Click or tap here to enter text.

# Title of Proposed Scan: Long-term Performance of balanced cantilever segmentally constructed concrete bridges

**Problem Statement** (What topic is to be examined? What drives the need for the scan? Why now?)

Recent information regarding long-term creep deflections in concrete has generated a need for Bridge Owners to evaluate their inventory of long-span balanced cantilever segmental bridges. This genre of bridge type represents important crossings in a States highway system. A recent example is the closure of the seven lane West Seattle Bridge over the Duwamish Waterway in Seattle, Washington. Closure of this major freeway is due to continued mid-span cracking in the bottom flange, web and the web to top slab interface. Issues associated to the cracking include concentration of tendon anchorages at a limited number of main span segments and the evaluation of long-term creep in concrete. This scan is primarily interested in the Repair, retrofit, and maintenance problems associated with specific design, construction methods, and structural details. Successful and unsuccessful methods to overcome identified problems. Enhanced or emerging technologies relating to inspection, maintenance, repair, or retrofitting.

**Scan Scope** (What specific subject areas are to be examined? Which cities and states might be visited? Which agencies/organizations (including specific departments or types of staff if applicable)?

This scan shall guide agencies to develop concentrated inspection techniques to identify conditions that cause premature cracking, distress and loss of geometry control. Guidance shall include recommendations on triggers to embark on structural analysis needs and appropriate long-term creep modeling. Recommendations shall include repair and strengthening methodologies. The scan will focus on the performance of balanced cantilever segmental bridge design and construction practices, safety to travelling public, and design and rehabilitation standards practiced by state DOT’s and local agencies. Consideration will be given to segmental bridge types with regards to long-term creep effect and prestressing tendon termination. The scan will focus on the condition of segmental bridges including bridge inspection reports, photographs, maintenance and safety. The scan will also include forensic inspection, rehabilitation, design, and repairs with respect to existing segmental bridges and consideration for repair methodologies. The domestic scan identifies best practices with regard to rehabilitation considerations among states and other transportation agencies. The scan will focus on states with significant number of long span segmental bridges built with balanced cantilever construction method.

**Anticipated Scan Results** (What key information is to be gained? What information is to be shared after the scan? Who would the audience be for this information?)

The segmental bridge domestic scan will augment information on current condition and long term performance segmental bridges for Improving Bridge Safety and Serviceability. One of the objectives will be to identify specialized technology and standards used in monitoring or inspecting segmental bridges to ensure optimal performance and minimize downtime during maintenance or rehabilitation. The scan findings will be essential in developing a guidance on best practices with regard to long term cheep and shrinkage consideration, and placement of intermittent continuity tendons. The anticipated scan results include: enhanced or emerging technologies relating to inspection, maintenance, repair, or retrofitting segmental bridges with intermident continuity tendons and unfavorrable log term creep and shrinkage deformation. Corrosion protection methods, methods for demolition, in the event of functional obsolescence or structural deficiency are included.

**Benefits Expected** (Including potential impacts on current technology or procedures) The domestic scan on performance of segmental bridges will provide recommendation to AASHTO LRFD Bridge Design Specifications for long term creep and shrinkage considerations for safety and functionality with respect to bridge serviceability. With a national inventory on long span segmental bridges, and better information on existing segmental bridges, we will be in a better position to identify critical bridge infrastructure needs with respect to bridge serviceability, safety and functionality. This scan would be of specific interest to the AASHTO Subcommittee on Bridges and Structures Technical Committees T-9, Bridge Preservation, T-10 concrete bridges, and T-18, Bridge Management. 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, university researchers, consultants, county and local transportation agencies. We will have better information to assess programmatic needs such as program level cost, scope and schedule for improving long term segmental bridge performance, maintenance and inspection, that will likely go along with future design and rehabilitation standards. The scan will include cost estimating for rehabilitation of existing bridges, retrofitting, maintenance and repairs for planning purposes.