

NCHRP 20-68 – “US Domestic Scan Program”

Scan 22-01 “Recent Leading Innovations in the Design, Construction and Materials Used for Concrete Bridge Decks”

Deterioration of concrete bridge decks due to corrosion of steel reinforcement is a long-known cause of limited-service life and increased maintenance costs bridge structures. To address these issues bridge owners have implemented a variety of strategies such as the use of fiber-reinforced concrete, performance-based concrete mixes, FRP composite reinforcement, modified curing regimens, deck sealers, shrinkage reduce admixtures, partial or full precast decks, and prestressed concrete. Agencies are anxious to identify appropriate strategies based on environmental variables and service demands that will extend the service life and save significant costs by reducing the rate of concrete deck deterioration, thereby delaying costly major rehabilitation and replacement activities caused by corrosion.

The Domestic Scan will identify lessons learned from construction of bridge deck projects that utilize innovative materials and strategies. The information collected will allow States to consider future approaches to design bridge decks to provide better durability and service life for decks of their structures.

Topics to be considered by the scan include:

- Design and details, construction specifications and maintenance procedures for durable deck designs that have demonstrated good in-service performance history.
- Specialized technology and standards used in monitoring, inspecting, and repair of innovative deck designs to ensure safety and serviceability with optimal performance and to minimize downtime during bridge maintenance and rehabilitation.
- Relative costs for design, construction, maintenance, and inspection of various innovative deck types. and
- Lessons learned and suggestions for improvement.

In deciding on agencies to be studied considerations should be given to the climate challenges of the regions they are located as well as traffic volume, and project size. States with severe climate challenges such as cold and freezing conditions, considerable or low amounts of precipitation and coastal state with bridges in a marine environment should be included in the sample. States with very high ADTs on a significant number of bridges as well as those with significant numbers of volume roads in their inventory should be investigated.

This scan would be of specific interest to the AASHTO Committee on Bridges and Structures, the AASHTO Committee on Materials and the AASHTO Committee on Maintenance. The scan report will provide current information on successful innovations in deck design to bridge owners. It will also provide valuable information to the AASHTO Committees for future consideration when revising or developing new bridge design and construction specifications, 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 deck designs, university researchers, consultants, county, and local DOTs.

Original Scan Proposal Title(s): Performance evaluation of concrete bridge decks constructed with innovative designs, materials, and construction methods.

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Donn Digamon, P.E. -Team Chair
State Bridge Engineer
Office of Bridge Design and Maintenance
Georgia DOT
600 West Peachtree St, 24th Floor
Atlanta, GA, 30308
470.561.0715 mobile
404.631.1883 office
dodigamon@dot.ga.gov

Bijan Khaleghi
State Bridge Design Engineer (retired)
WSDOT - Bridge & Structures Office
Olympia, WA 98504-7340
Office: (360) 705-7181
Cell: (360) 522-2846
khalegb@wsdot.wa.gov

Hannah Cheng
Structural Engineering,
New Jersey DOT
(609) 963-1316
Xiaohua.Cheng@dot.nj.gov

Trey Carroll
Structures Management Unit
North Carolina DOT
(919) 707-6465
thcarroll1@ncdot.gov

Terry B. Koon
Structural Design Support Engineer
South Carolina DOT
(803) 737-4814
koontb@scdot.org

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

Cheryl Hersh Simmons, S.E.
Chief Structural Engineer
Utah DOT
4501 South 2700 West
Salt Lake City, UT 84114
Cell: 801.557.7846
cherylhersh@utah.gov

Don Nguyen-Tan
Chief, office of bridge design
Caltrans
(916) 639-5929
don.nguyen-tan@dot.ca.gov

Pete White
Bridge Engineering Design Manager
Indiana DOT
100 North Senate Ave., N758 – BRD
Indianapolis, IN 46204
Phone: (317) 232-5371
PeWhite@indot.in.gov

Kevin R Pruski, PE
Texas Department of Transportation
Bridge Division
Bridge Implementation Engineer
512-552-5971
Kevin.Pruski@txdot.gov

Scott M. Walls, P.E., M.C.E.
Project Manager, Bridge Design
Delaware Department of Transportation
Phone: (302) 760-2317
scott.walls@delaware.gov

Rick Liptak
Chief Bridge Construction Engineer
Michigan DOT
231.590.3382
liptakr@michigan.gov

Harry L. White 2nd
Director, Structure Policy and Innovation
Bureau
NYSDOT
50 Wolf Road, Albany, NY 12232
Work: (518) 485-7256
harry.white@dot.ny.gov

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

Pinar Okumus – Subject Matter Expert
Associate Professor
Civil, Structural and Environmental Engineering
University at Buffalo, The State University of
New York
T: (716) 645 4356
Email: pinaroku@buffalo.edu