

Mitigating Distress and Deterioration at Bridge Ends



Image courtesy of Virginia DOT

Virginia DOT has developed innovations such as the “Virginia abutment” for improved drainage, as well as backfill strategies to reduce the “bump at the end of the bridge.”

SCAN FOCUS

The interface between the road and the bridge present frequent design and maintenance challenges, particularly at the ends where the bridge meets the road. With Domestic Scan 19-01, the scan team sought to learn from state departments of transportation (DOTs) what tried-and-tested strategies can be used to increase bridge durability, reduce the need for repair, and improve user experience.

PERSON-TO-PERSON RESEARCH

After conducting interviews and a review of several state DOTs’ bridge design manuals, the scan team selected 12 agencies to participate in a multi-day peer exchange session in late 2019. Representing a variety of climate, structural, and geological design challenges, each agency presented its details and lessons learned for bridge-end features, such as joints, abutments, embankments, approach slabs, and drainage.

NEXT STEPS Put It into Practice

EXPLORE NEW IDEAS

The effective bridge design specifications shared by host states may suit your agency’s needs as well.

GET INVOLVED

Help problem-solve with AASHTO’s Committee on Bridges and Structures and its technical committees at bridges.transportation.org

READ MORE

The full report on Scan 19-01 is available at domesticscan.org/19-01.

SUGGEST FUTURE SCANS

What topic do you have for an NCHRP Domestic Scan?

See web.transportation.org/nchrp/20-68A.

PRELIMINARY FINDINGS

With so many methodologies and rationales involved in each state’s bridge designs, the scan team and host agencies determined that a standardized performance measurement system would help states better understand and compare how bridge components fared over time. Metrics would also help bridge designers as they strive to improve durability and reduce deterioration-related problems, such as the bump road users feel when they approach or leave a bridge.



Image courtesy of Pennsylvania DOT

By focusing on bridges of similar size and design, Pennsylvania DOT developed a standardized process to replace hundreds of single-span bridges and culverts.

PUTTING IT TO WORK

Despite the variety of design methods, the scan team compiled a list of five insights and recommendations:

1. Pile treatments can be used to prevent corrosion issues at bridge abutments.
2. Most of the participating DOTs prefer jointless bridges. Removing joints from the bridge deck reduces the potential for damage to a variety of structural features.
3. Approach slabs should be designed by the bridge office (as opposed to the road designer).
4. More priority should be placed on an embankment’s backfill material and how it is compacted.
5. Removing water from the bridge deck is critical to a bridge’s durability.

SHARING THE RESULTS

Scan team members are giving presentations at a variety of state and national conferences. The team is also pursuing opportunities for additional workshops, webinars, and journal articles to disseminate their findings. A “Quick Take” video discussing the project is available at domesticscan.org/19-01.

ABOUT THE PROGRAM: The NCHRP U.S. Domestic Scan Program (NCHRP Project 20-68, domesticscan.org) recognizes the value of firsthand sharing of new technologies and practices. Launched in 2006, the program typically sponsors two or three scans per year, putting state and federal DOT practitioners who need solutions in touch with innovative peers around the country, speeding the transfer of technology and know-how. During the intense experience of the scan (typically one to two weeks), participants see how a new technology or practice works in the real world. They also develop close professional relationships that remain readily available to them years later.

SCAN PARTICIPANTS



Image courtesy of Federal Highway Administration

SCAN TEAM

Jason DeRuyver, AASHTO Chair, Michigan DOT
 Devan Eaton, Maine DOT
 Romeo Garcia, FHWA
 Bijan Khaleghi, Washington State DOT
 Ted Kniazewycz, Tennessee DOT
 Adam Lancaster, Louisiana DOTD

PEER EXCHANGE PARTICIPANTS

California Department of Transportation	Pennsylvania DOT
Iowa DOT	South Dakota DOT
Louisiana DOTD	Tennessee DOT
Maine DOT	Utah DOT
Massachusetts DOT	Virginia DOT
Minnesota DOT	Washington State DOT

SUBJECT MATTER EXPERT

Jill Walsh | jwalsh@stmartin.edu

NCHRP SENIOR PROGRAM OFFICER

Andrew Lemer | alemer@nas.edu

SCAN MANAGEMENT

Harry Capers | hcapers@arorapc.com

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