

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

Scan Team Membership

Kevin Thompson, AASHTO Chair
State Bridge Engineer
California DOT
Div. Engineering Services, Structure Design
P.O.Box 168041
1801 30th Street
Sacramento, CA 95816-8041
Phone: (916) 227-8807
Fax: (916) 227-8149
E-mail: Kevin.Thompson@dot.ca.gov

Jesus M. Rohena, FHWA Chair
Senior Tunnel Engineer
FHWA Office of Bridge Technology
HIBT-10, Room 3203
400 Seventh Street, SW.
Washington, DC 20590
Phone: (202) 366-4593
Fax: (202) 366-3077
E-mail: jesus.rohena@fhwa.dot.gov

Michael G. Salamon
Tunnel Superintendent
Colorado DOT
4201 East Arkansas Ave
Denver, CO 80222-3406
Phone: (303) 512-5731
Fax: (303) 512-5799
E-mail: Michael.salamon@dot.state.co.us

Alexander K. Bardow
Director of Bridge and Structures
Massachusetts Highway Department
10 Park Plaza, Suite 6430
BOSTON, MA 02116-3973
Office: (617) 973-7571
Fax: (617) 973-7554
E-mail: Alexander.bardow@mhd.state.ma.us

Louis Ruzzi
District Bridge Engineer for Engineering
District 11-0(Pittsburgh Area)
Pennsylvania DOT
45 Thomas Run Road
Bridgeville, PA 15017
Phone: (412) 429-4893
Fax: (412) 429-5085

E-mail: lruzzi@state.pa.us
Bijan Khaleghi
State Bridge Design Engineer
Washington State DOT
Bridge & Structures Office
P.O.Box 47340
Olympia, WA 98504-7340
(360) 705-7181
E-mail: khalegb@wsdot.wa.gov

Barry B Brecto, P.E.
Division Bridge Engineer
FHWA Washington State Division
711 S. Capitol Way, Suite 501,
Olympia, WA 98501
Ph: 360-753-9482
Fax: 360-753-9889
E-mail: Barry.Brecto@dot.gov

Fulvio Tonon, Ph.D., P.E. (TX; Italy, EU)
Assistant Professor
The University of Texas at Austin Department
of Civil Engineering
1 University Station C1792
Austin, TX 78712-0280 USA
(Office location: ECJ 9.227F)
PH (Direct): +1-512-475-8196
PH (Secretary): +1-512-471-4929
FAX: +1-512-471-6548
E-mail: tonon@mail.utexas.edu

Mary Lou Ralls, P.E., SME
Principal
Ralls Newman, LLC
2906 Pinecrest Drive
Austin, TX 78757
Phone: (512) 422-9080
Fax: (512) 371-3778
E-mail: ralls-newman@sbcglobal.net

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