**QUARTERLY PROGRESS REPORT**

January 1, 2015 to March 31, 2015

- Three technical reports and five technical papers related to this study have recently been published. See below for details. The reports are available on the TFHRC website. See appropriate proceedings for the papers.
- The results of wind tunnel testing at NRCC indicated that the degree of roundness of HDPE is an important factor in the aerodynamics of bridge cables. To address this, FHWA has initiated follow-on testing at NRCC that will evaluate approximately 10 out-of round shapes under a variety of wind tunnel conditions and with models in realistic cable orientations. Initial shapes will be assumed, but most will be based upon field observations and measurements.
- To obtain detailed field measurements on the shape and condition of HDPE, the FHWA has designed, developed, and fabricated a robotic device. This robot is currently being programmed and proof tested in the FHWA Aerodynamics Laboratory at TFHRC. This robot will be deployed to the field for cable surveys in the near future.
- Two additional technical reports and one technical paper are currently in preparation.
- Finally, although this pooled-fund study is in the final stages of closeout, work on the guidelines document will continue. Updates are being made as new information becomes available from other ongoing projects.

**CABLE TECHNICAL PUBLICATIONS - FHWA**

1. *Dynamic Properties of Stay Cables on the Penobscot Narrows Bridge*, by H.R. Bosch and J.R. Pagenkopf, Report No. FHWA-HRT-14-067, Federal Highway Administration, McLean, VA, September 2014. Available at http://www.fhwa.dot.gov/publications/research/infrastructure/structures/bridge/14067/index.cfm.

2. Dynamic Properties of Stay Cables on the Bill Emerson Bridge, by H.R. Bosch and J.R. Pagenkopf, *Proceedings of the 12th Americas Conference on Wind Engineering*, Seattle, Washington, June 2013.

3. *Wind Tunnel Investigations of an Inclined Stay Cable with a Helical Fillet*, by G.L. Larose and A. D'Auteuil, Report No. FHWA-HRT-14-070, Federal Highway Administration, McLean, VA, September 2014. Available at http://www.fhwa.dot.gov/publications/research/infrastructure/structures/bridge/14070/index.cfm.

4. Wind-Induced Vibrations of Dry Inclined Stay Cables in the Critical Reynolds Number Range, by J.B. Jakobsen, G.L. Larose, A. D'Auteuil, J.H.G. Macdonald, and H.R. Bosch, *Proceedings of the 6th Symposium on Strait Crossings*, Bergen, Norway, June 2013.

5. Wind-Tunnel Investigations of an Inclined Stay Cable with a Helical Fillet, by G.L. Larose, A. D'Auteuil, H.R. Bosch, J.B. Jakobsen, and J.H.G. Macdonald, *Proceedings of the 6th European-African Conference on Wind Engineering*, Cambridge, UK, July 2013.

6. Sectional Load Characteristics of a Dry Inclined Helical Filleted Cable, by H. Christiansen, J.B. Jakobsen, J.H.G. Macdonald, G.L. Larose, and H.R. Bosch, *Proceedings of the 13th Conference of the Italian Association for Wind Engineering*, Genova, Italy, June 2014.

7. Comparison of the Aerodynamics of a Bridge Cable with Helical Fillets in Smooth and Turbulent Flow, by H. Christiansen, J.B. Jakobsen, G.L. Larose, J.H.G. Macdonald, A. D'Auteuil, and H.R. Bosch, *Proceedings of the Symposium on the Dynamics and Aerodynamics of Cables*, Copenhagen, Denmark, September 2014.

8. *Mitigation of Wind-Induced Vibration of Stay Cables: Numerical Simulations and Evaluations*, by S. Park and H.R. Bosch, Report No. FHWA-HRT-14-049, Federal Highway Administration, McLean, VA, August 2014. Available at http://www.fhwa.dot.gov/publications/research/infrastructure/structures/bridge/14049/index.cfm.