# Dowel Bar Task Force Update

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| **Solicitation Number:** | |
| **Status:** | |
| **Title:** | Development of Improved Tests and Specifications for Corrosion Resistant Dowel Bars |
| **Sponsoring Agency:** | TBD |
| **Sponsor Solicitation Contact:** | TBD |
| **Technical Contact:** | TBD (developed by: Tom.Burnham@state.mn.us)<br>Phone: TBD (651-366-5452) |
| **Lead Agency:** | TBD |
| **Partners:** | TBD |
| **Date Posted:** | |
| **Solicitation Expires:** | |
| **Commitment Start Year:** | 2016 |
| **Commitment End Year:** | 2018 |
| **Duration:** | 24 months |
| **100% SP&R Approval:** | Pending Approval |
| **Commitments Required:** | $240,000 |
| **Commitments Received:** | $ |

**Background:**

The inclusion of dowel bars into jointed concrete pavements has long been shown to significantly increase joint performance under heavy traffic loads. Historically, the life expectancy of dowel bars was not considered to be an issue, since most concrete pavements were designed with a service life of 35 years of less. For pavements exposed to typical deicing chemicals like sodium chloride, the use of epoxy coated steel dowels have in most cases provided sufficient capacity for this length of service. However, with increasing congestion and shrinking budgets, agencies are interested in investing in longer life concrete pavements. In addition, newer more effective, but also more corrosive, deicing chemicals are being used on pavements today. The combined need for enhanced corrosion resistance and longer service life has recently led to the development of alternative dowel bar materials and configurations. Agencies are struggling with the acceptance of these new dowel bar types, as their current test methods and specifications are catered solely to epoxy-coated steel dowels.
The higher demands on dowel bars in long life concrete pavements may require different or modified tests to ensure their quality and robustness.

Currently, the most common specifications and tests used by agencies for accepting dowel bars are AASHTO M254 and AASHTO T253. As mentioned above, these are specifically applicable to epoxy-coated steel dowel bars. Due to the different materials and fabrication techniques associated with alternative dowel bars designed for more corrosion resistance and longer life, it was felt that the tests in AASHTO T253 should be reviewed for applicability. A National Concrete Consortium (NCC) task force recently completed such an effort. While many of the existing tests in T253 were found to be the relevant for other dowel bar types and materials, other tests were proposed to accommodate some of the current and potential future materials used in dowel bars. This preliminary effort was unable however, to produce specific values and ranges for individual performance tests. The NCC Dowel Bar Task

force also developed proposed changes to the AASHTO M245 specifications toward including all dowel bar types and materials.

Before agencies can confidently accept a particular dowel bar based on the proposed updates to AASHTO M254 and T253, there is a need to complete the work of identifying appropriate test method parameters, results and specifications that ensure long term performance.

**Objectives:**

Utilizing the recommendations provided by the NCC Dowel Bar Task Force 2.0, this project has two main objectives:
1. Develop recommended changes to the AASHTO T253 standard. This will include identifying existing performance tests, or developing new ones that will provide confidence to agencies that a particular dowel system will supply adequate load transfer for all concrete pavements, including long life designs. These tests will focus on both the structural capacity of the dowel system, as well as its long-term corrosion resistance.
Based on the results of the performance tests, this effort will include developing guidelines of expected performance of a dowel system for a given loading and climate exposure.

2. Develop recommended changes to the AASHTO M245 specifications. These specifications will be applicable to all currently produced corrosion resistant dowel systems, but also flexible enough to accommodate future innovative dowel systems and materials.

**Scope of Work:**

This research project would be carried out in 6 tasks:
1. Review and refine the dowel bar system structural equivalency test proposed by the NCC Dowel Bar Task Force 2.0. Conduct tests on 5 different dowel bar systems, with a standard epoxy-coated dowel bar system as the control.
2. Review, refine or select appropriate dowel bar corrosion resistance tests similar to those proposed by NCC Dowel Bar Task Force 2.0. Conduct tests on up to 10 different dowel bar types, including standard epoxy-coated dowel bars.
3. For the tests in Tasks 1 and 2, determine dowel bar performance guidelines for various applications (service life under given traffic, climate, and type of deicer exposure).
4. Draft corrosion resistant dowel bar test protocols in the language and format similar to current AASHTO T253.
5. Draft corrosion resistant dowel bar specifications in the language and format similar to current AASHTO M254.

6. Create guidelines for implementation of the proposed new AASHTO products developed in previous tasks. These guidelines will be used by owners to aid in the acceptance of all current and future corrosion resistant dowel bars for concrete pavements.

**Comments:**

This study will provide language intended to update current AASHTO corrosion resistant dowel bar testing standards and specifications, as well as guidance for their application. States and Agencies will be able to select corrosion resistant dowel bar systems that will function for their given traffic loading and climate. This study will address the lack of knowledge related to the robustness of recently introduced innovative dowel bar materials and geometries designed to function in long-life concrete pavements.

Participating states to commit $15,000 each year for 2 years.

**Documents:**