

## MaineDOT Cyclical Pavement Resurfacing (CPR) Program

### **CPR subcommittee members:**

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### **Introduction**

In December of 2015, the Maine Department of Transportation's Commissioner and Chief Engineer directed the development of the Department's Highway Management Plan to review current and identify new management strategies for Maine's highway network. A Roads Report Team consisting of professional highway engineers from the Highway Management Group, Bureau of Project Development, and Bureau of Maintenance and Operations was formed to discuss the state of our highway system and current policies, to assess the condition and performance of the system, and to make recommendations as to how we can maximize the return on investment in our highway assets. One of the major recommendations of this group was to develop a treatment that would address the declining condition of the category HCP-3 roadways. Current funding levels will not allow for our traditional pavement preservation treatments to be applied to the HCP-3's as the cost for such a strategy would exceed \$40,000,000 per year. Therefore, the Roads Report group recommended a cycle paving program be developed to maintain serviceability of the eligible HCP-3 roadways by extending the service life, while maintaining the investment in the roadway and integrity of the pavement structure. Though this treatment does not add capacity or structural value, it does restore the overall condition of the transportation facility. Materials meeting standard specifications would be used to allow for future potential recycling of the treated roadways.

Moving forward, the program will define the expected improvements to the pavement as well as other roadway elements. Focus will be on extending the service life of the pavement surface and identifying and improving critical safety and roadway issues. Prudent risk through engineering judgment will be weighed against standards based on customer expectations and traffic volume.

**Treatment Overview:** The goal for the CPR treatment is to maintain serviceability of the facility by extending the service life of the pavement and the integrity of the pavement structure, thus improving or sustaining the facility in a state of good repair. The scope of work is primarily for a variable-depth shim and a ¾" HMA surface course over existing pavement. The target tonnage per mile for the treatment will be 1200 tons, assuming a 28 ft. wide roadway. The treatment will be performed on a cycle basis (on a regional level) on eligible roadways. The treatment would only be applied to built roadways in the new HCP-3 corridor priority.

**Project Selection:** The CPR projects will not be selected in the traditional 3 year work plan process, but in a manner similar to the light preservation treatments. Much like with Light Capital Paving, a significant portion of the candidates will be selected two years prior to construction. The candidates are then evaluated and selected in the year prior to construction by a team consisting of Highway Management, Maintenance & Operations representatives, and Project Development personnel. The existing network-level ARAN data will be leveraged to provide cross-slope and shim area measurements to assist field staff in determination of deficient areas (high IRI, excessive cross slope, etc). Candidate selection will be based upon protecting existing investments with maintaining serviceability of the network. Each Region will receive an allotment of funding with an associated mileage expectation. Funding is provided based upon the attached estimated budget, showing the treatment funded at \$135,000 per mile. Allowable tonnage per mile is adjusted on a project basis based upon actual widths and square yards identified during the selection process. However, the targets of 1200 tons/per mile and the associated mileage expectation shall be met on a Region basis for each construction season.

**Design / Construction:** The CPR projects require preliminary engineering by Project Development personnel in the Regions. During design, there is consideration for cross slope, although the treatment will not be held to the Engineering Council guidance on cross-slopes. Considerations shall be made with regard to safety, with improvements made in areas where safety is deemed to be inadequate due to cross-slope. Existing cross-slope data will be analyzed. The intent shall be to establish a consistent, reasonable cross slope for the roadway and establishing superelevation as needed to ensure ride quality and comfort to the user. Historic crash data is investigated on CPR projects to help identify where improvements are necessary.

The HMA material will be a 9.5 mm nominal maximum aggregate size mix, with an approved design meeting all the applicable requirements of Sections 400 and 700 of the specification. The HMA is accepted under Method C parameters (asphalt content & gradation), and no incentive/disincentive provisions for density applies. The Contractor is required to supply a quality control technician with a densometer during all surface production to maximize the density of the mixture, and a minimum roller train (including a rubber-tired roller) is required.

All existing guardrail will comply with the Guardrail and Guardrail Terminal Policy under Rehabilitation. New guardrail shall be used in spot locations along a project to protect vehicles from a hazard. Engineering judgment shall be used to determine if the installation of guardrail is introducing a greater hazard. Prior to guardrail installation the following items shall be considered.

- Body of water at base of slope
- Vertical drop of 15' or more from top of slope to bottom of slope
- Alignment of roadway next to hazard (outside of curve, inside of curve, tangent section)
- Crash history at that location
- Length of hazard

Ditching items (including backing up of shoulders) are included in the project, but the assumption is made that no borrow is needed and all material is available from ditching and in-

slope work. In addition, any culvert work, frost heave repairs, and other maintenance activities will not be completed as part of the project. Any needed culvert work will be performed or administered by Maintenance & Operations prior to the year of paving. No field office item will be included in the contract. The CPR contracts are structured to include multiple projects in a geographic area to achieve an economy of scale.

**Program Requirements:** The CPR Program is targeted at the 1297 miles of built HCP 3's. Analysis of 3/4" overlays performed by MaineDOT's pavement management and research units indicates a life expectancy in preservation of 9.2 years. The cycle of this program has been established at 9 years. 144 miles would need to be paved annually to fully deliver this program. The cost estimated for this treatment averages \$135,000/mile. The annual funding need is estimated to be \$19,440,000.