

Pavement & Materials Partnering Committee

Work Product Scoping Document

New

Evaluate the New Hot Mix Asphalt Pavement Smoothness Specification

April 11, 2019

Task Group

Asphalt Task Group/Asphalt Subtask Group/Smoothness Working Group

Title

Evaluate the New Hot Mix Asphalt Concrete Pavement Smoothness Specification

Problem Process

- Annual
- Expedited
- Emerging Initiative

Statement of Effort/Improvement *(What is the issue?)*

Caltrans recently developed a new hot mix asphalt (HMA) pavement smoothness specification with new Mean Roughness Index (MRI) thresholds and incentives/disincentives. The new specification will be implemented on projects in 2019. Successful use of this new HMA pavement smoothness specification will require partnership between Caltrans and Industry. Further improvements to the specification should be based on data collected from projects using the new specification. Through consistent data collection and analysis, this Working Group will provide a needed feedback mechanism to evaluate the smoothness information received from HMA pavement projects using the new specification. This evaluation is crucial and needed as the basis for any future adjustments to the smoothness specification.

Purpose *(Why we need to work on this.)*

HMA pavement smoothness continues to be a top priority for Caltrans and the travelling public. The current smoothness specifications have resulted in many disputes claiming that the specified smoothness requirement could not be achieved. As a result, a new smoothness specification for HMA pavements has been prepared in partnership with Industry. The main purpose of this effort is to evaluate these new thresholds to make sure they are achievable but not too lenient. Therefore, the objectives of this Working Group are to 1) gather and analyze smoothness information from projects, 2) produce a report showing the project smoothness results, and 3) make any recommendations for modification to the smoothness specification. With new financial incentives and disincentives, ensuring an optimum incentive/disincentive balance based on data-driven results from the new smoothness specification is crucial to reward good paving practices.

Background *(Background information to better understand the issue or provide information on other efforts on going related to the issue.)*

Achieving HMA pavement smoothness has been a long-standing goal at Caltrans. The traveling public has identified pavement smoothness as one of the most important factors in rating the

roadway. In addition to providing a more comfortable ride, the other benefits of pavement smoothness include:

- Smoother pavements generally reduce fuel usage and maintenance costs, which can be significant when accounting for expected traffic volumes and pavement life. The reduced fuel usage will decrease greenhouse gas emissions. The smoother HMA pavements will remain smoother longer and in turn extend the service life of the pavement.

Approach *(What approach will the Task Group use to attempt to ensure that the effort/improvement 1) will be Street-Ready, 2) will be tracked and managed to ensure expected performance and 3) will be implemented consistently statewide? This includes defining stakeholders to be included in the effort/improvement to attempt to ensure consistent implementation statewide as appropriate. What training/ guidance will be required? If “Pilot Projects” are to be used explain how in the approach.)*

1. **Street Ready Assurance**

Caltrans staff will collaborate with our industry partners on evaluating the new HMA pavement smoothness specification. This effort will focus on the evaluation of all MRI data for each 0.1 mile segment of data reported as required by the contract of the following project types:

- HMA placed in a single lift over an existing surface without any opportunity to correct the existing surface.
- HMA placed in a single lift over an existing surface with an opportunity to correct the existing surface.
- HMA placed in a single lift as a mill and fill operation where cold planing work is performed in the same shift.
- HMA placed in a single lift as a mill and fill operation where cold planing work is performed not in the same shift.
- HMA placed over an existing surface where two paving lift opportunities are available and without an opportunity to correct the existing surface.
- HMA placed over an existing surface where two paving lift opportunities are available and with an opportunity to correct the existing surface.
- HMA placed over an existing surface where three or more lift opportunities are available with or without an opportunity to correct the existing surface.
- Open-graded friction course placed on new HMA
- Open-graded friction course placed on an existing surface without any opportunity to correct the existing surface.
- Open-graded friction course placed on an existing surface with an opportunity to correct the existing surface.
- Open-graded friction course placed as a mill and fill operation.

2. Performance Tracking/Management

Track the following parameters in selected HMA pavement projects using the new specification:

- 0.1-mi MRI values
- Paid incentives and disincentives
- Project conditions that may have influenced smoothness outcomes

Team Members (Indicate CT Chair and Industry Lead)

CT/Industry	Division/Firm Name	Member Name
CT Chair	HQ Pavements	Allen King
CT	HQ Pavements	Saeed Pourtahmasb
CT	HQ Pavements	Sri Holikatti
CT	HQ Construction	Pete Spector
CT	HQ METS	Veera Nanugonda
Industry Lead	California Asphalt Producers Association (CALAPA)	Brandon Milar
Industry	Surface Systems and Instruments, Inc. (SSI)	Nicholas Schaefer
Industry	Pavement Recycling Systems.	Don Mathews

Team should not include more than 4 Caltrans staff and 4 members from Industry. See PMPC Standard Operating Procedures for more information.

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Objectives/Deliverables/Due Dates *(What is important to be done, what is the expected outcome, and when is each deliverable due and to who?)*

Description:

1. Collect and compile smoothness data for selected HMA pavement projects using the new HMA pavement smoothness specification
2. Analyze smoothness data from selected HMA pavement projects and calculate the percentage of sections within each pay range by smoothness requirement to evaluate the adequacy of the supplemental funds for construction administration.
3. Report the analyzed data.
4. Recommend changes to specifications if deemed necessary.

Details:

Milestones	Name - Responsible Party	Due Date (Start/Complete)
1.1 Develop Asphalt Smoothness Design Guidelines	Allen King / Saeed Pourtahmasb	July 2018/December 2018
1.2 Develop Asphalt Smoothness Design Guidelines Training for Caltrans staff	Allen King / Saeed Pourtahmasb	November 2018/December 2018
1.3 Outreach and train designers, office engineers, and pavement engineers in all 12 Districts	Allen King / Saeed Pourtahmasb	December 2018/March 2019
2.1 Collect/Compile Interim Data	Saeed Pourtahmasb / Don Mathews / Veera Nanugonda	March 2019/January 2020
3.1 Analyze Interim Data	Allen King / Pete Spector / Nicholas Schaefer / Veera Nanugonda	January 2020/February 2020
4.1 Interim Report	Sri Holikatti / Brandon Milar / Veera Nanugonda	March 2020/April 2020
5.1 Interim Recommendations	Allen King / Pete Spector / Don Mathews	March 2020/April 2020
6.1 Final Report	Allen King / Brandon Milar	May 2020

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Resources To Develop and Implement *(Staff hours and expenses.)*

	Caltrans Hours	Industry Hours
1. Develop Training Documents & Train Staff	OAP: 1.0 PY OCS: 0.25 PY METS: 0.01 PY	.05 PY
2. Collect/Compile Data	OAP: 0.25 PY OCS: 0.05 PY METS: 0.01 PY	0.1 PY
3. Analyze Data	OAP: 0.20 PY OCS: 0.10 PY METS: 0.01 PY	0.2 PY
4. Interim Report	OAP: 0.10 PY OCS: 0.05 PY METS: 0.01 PY	0.15 PY
5. Recommendations	OAP: 0.15 PY OCS: 0.15 PY METS: 0.01 PY	0.05 PY
6. Final Report	OAP: 0.05 PY OCS: 0.0 PY METS: 0.0 PY	0.05 PY

*NOTE: 1 PY = 2000 Hours

Benefits *(For example, increased life cycle, reduced costs, reduced risk factors, compliance with Caltrans goals etc.. Quantify benefits and define success and performance measures.)*

The new specifications include acceptance criteria for HMA pavement smoothness. The various levels of HMA pavement smoothness are quantified and pre-determine what Caltrans will pay for these levels. Since contractors will receive an incentive for smoother HMA pavement and a disincentive for rougher HMA pavement, the overall quality and smoothness is expected to improve with the new specifications. This will benefit Caltrans, as smoother HMA pavements require less maintenance, stay smoother longer and which, in turn, extends service life.

Estimated Impact to Caltrans and Contractor - *(What are the impacts to policy, specifications, construction practices, and stakeholders? Include an estimate to overall increase/decrease in project cost, District/HQ resources at project level, and Contractor/supplier impact. Estimate increased/reduced risk factors for Caltrans and Contractor.)*

The new specifications will reduce risk to Caltrans and contractors since HMA pavement smoothness is clearly defined with acceptance criteria and associated payment incentives and disincentives used to motivate contractors to pave smoother. Caltrans will include additional supplemental funds in a project to pay for HMA smoothness incentives.

Impediments to Completion of Deliverables – *(Identify impediments and potential mitigation measures to address impediments.)*

HMA pavement smoothness is the highest priority of the Asphalt Task Group. With this in mind, supervisors will be supportive of team members devoting time to work on this effort. Meeting the deliverable dates will require commitment from all team members. Team members should keep the group informed if there is a risk to missing a deliverable date. Utilizing other Caltrans staff and consultants are options for completing this effort on schedule but ultimately the Asphalt Subtask Group will be responsible for the deliverables.

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Recommendation and Approval

This scoping document for *Evaluate the New HMA Pavement Smoothness Specification* was prepared by the *Asphalt Sub-Task Group* to address a priority issue with statewide significance and is within the Pavement & Materials Partnering Committee mission as described in the Pavement & Materials Partnering Committee Charter. The Subtask Group members have determined the scope, resources required and timeline for delivery of this project to attempt to ensure that the deliverables are achievable. A signature here indicates that each Task Group and PMPC Executive Committee is committed to providing the resources to support this effort within the prescribed timeframes. Furthermore, it is everyone's responsibility to ensure that the final effort/improvement will be:

- 1) Street-Ready,
- 2) Monitored and reported for performance,
- 3) Successfully implemented statewide as appropriate.

Scoping Document Recommendation and Industry Concurrence by (name and date):

Caltrans Name (Recommendation)	Date	Industry Name (Concurrence)	Date
Tom Pyle <i>Tom Pyle</i> Caltrans Task Group Chair	4-17-19	Pat Imhoff, CalPortland Industry Task Group Lead	
Blair Anderson <i>Blair Anderson</i> Caltrans Task Group Member	4/12/19	Tracy Zubek, DeSilva Gates Construction Industry Task Group Co-Member	
Tim Greutert <i>Tim Greutert</i> Caltrans Task Group Member	4/12/19		

Scoping Document Approval and Industry Concurrence by (name and date):

Caltrans Name (Approval)	Date	Industry Name (Concurrence)	Date
<i>[Signature]</i> Sergio Aceves Caltrans PMPC Executive Committee – Chair Pavement Program	4/18/19	<i>[Signature]</i> Russ Snyder, CalAPA Industry PMPC Executive Committee	4/18/19
<i>[Signature]</i> Ray Hopkins Caltrans PMPC Executive Committee Headquarters Construction	4/18/19	<i>Charles J. Rea</i> Charley Rea, Cal CIMA Industry PMPC Executive Committee	4/18/19
<i>[Signature]</i> Dan Speer Caltrans PMPC Executive Committee Materials Engineering and Testing Services	4/18/19	<i>[Signature]</i> Pete Fernandez Industry PMPC Executive Committee	4/18/19

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Approval Date: _____