

**Pavement & Materials Partnering Committee**  
**Work Product Scoping Document**  
**New**  
**Evaluate the New Concrete Pavement Smoothness Specification**  
**November 28, 2018**

**Task Group**

Concrete Task Group

**Title**

Evaluate the New Concrete Pavement Smoothness Specification

**Problem Process**

- Annual
- Expedited
- Emerging Initiative

**Statement of Effort/Improvement**

Caltrans recently developed a new concrete pavement smoothness specification with new Mean Roughness Index (MRI) thresholds and incentives/disincentives. The new specification will be implemented on projects in early 2019. Successful use of this new concrete 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 concrete pavement projects using the new specification. This evaluation is crucial and needed as the basis for any future adjustments to the smoothness specification.

**Purpose**

Concrete 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 concrete pavements has been prepared in partnership with Industry. The main purpose of this effort is to evaluate these new thresholds to make sure they 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**

Achieving concrete 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, smoother pavements generally reduce fuel usage and maintenance costs, which can be significant when accounting for expected traffic volumes and pavement life. By its turn, reduced fuel usage decreases greenhouse gas

emissions and reduced maintenance operations decreases traffic delays over the pavement's extended service life in terms of smoothness.

## **Approach**

### 1. Street Ready Assurance

Caltrans staff will collaborate with our industry partners on evaluating the new concrete pavement smoothness specification. This effort will focus on the evaluation of MRI for each of the following project types:

- Continuously Reinforced Concrete Pavement (CRCP) New/Reconstruction (Smoothness Target 60)
- CRCP Widening/Lane Replacement and Jointed Plain Concrete Pavement (JPCP) New/Reconstruction (Smoothness Target 67.5)
- JPCP Widening/Lane Replacement (Smoothness Target 75)
- Grinding of Existing Concrete Pavement (Smoothness Target Percent Improvement)

### 2. Performance Tracking/Management

Track the following parameters in at least three statewide concrete pavement projects and more if they are available using the new specification:

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

### 3. Consistently Implemented

Caltrans and Industry will collaborate on developing recommendations for potential changes to the new specifications. Successful evaluation of the new concrete pavement smoothness specifications will require that all involved parties work together to obtain the needed information in their respective role. This Working Group will reach out the project Resident Engineer's and Contractor's to identify challenges and successes regarding pavement smoothness.

### 4. Pilot Projects (if anticipated)

None.

5. Research Needs (if necessary)

None.

**Team Members (Indicate CT Chair and Industry Lead)**

<b>CT/Industry</b>	<b>Division/Firm Name</b>	<b>Member Name</b>
CT Chair	HQ Pavements	Dulce Rufino Feldman
CT	HQ Construction Standards	Deborah Yost
CT	HQ Pavements	Ron Jones
CT	HQ Materials Engineering and Testing Services (METS)	Bomasur Banzon
Industry Lead	Southwest Concrete Pavement Association (SWCPA)	Charles Stuart
Industry	Surface Systems and Instruments, Inc. (SSI)	Nicholas Schaefer
Industry	International Grinding and Grooving Association (IGGA)	Larry Scofield
Industry	Brosamer Wall	Tim Schaftlein

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

**Objectives/Deliverables/Due Dates**

Description:

1. Collect and compile smoothness data for selected concrete pavement projects using the new concrete pavement smoothness specification
2. Analyze smoothness data from selected concrete 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:

<b>Milestones</b>	<b>Name - Responsible Party</b>	<b>Due Date (Start/Complete)</b>
Collect/Compile Interim Data	Dulce Rufino Feldman/ Charles Stuart	March 2019/November 2019
Analyze Interim Data	Dulce Rufino Feldman/ Nicholas Schaefer	June 2019/January 2020
Interim Report	Dulce Rufino Feldman/ Charles Stuart	January 2020/March 2020
Interim Recommendations	Deborah Yost	January 2020/March 2020
Collect/Compile Final Data	Dulce Rufino Feldman/ Charles Stuart	March 2020/November 2020
Analyze Final Data	Dulce Rufino Feldman/ Nicholas Schaefer	June 2020/January 2021
Final Report	Dulce Rufino Feldman/ Charles Stuart	January 2021/March 2021
Final Recommendations	Deborah Yost	January 2021/March 2021

**Resources To Develop and Implement**

	Caltrans Hours			Industry Hours		
	FY 18/19	FY 19/20	FY 20/21	FY 18/19	FY 19/20	FY 20/21
1. Collect/Compile Data	78	176	98	39	88	49
2. Analyze Data	27	220	193	22	176	154
3. Report	0	132	132	0	132	132
4. Recommendations	0	264	264	0	44	44

**Benefits**

The new specifications include acceptance criteria for concrete pavement smoothness. The various levels of concrete pavement smoothness are quantified and pre-determine what Caltrans will pay for these levels. Since contractors will receive an incentive for smoother concrete pavement and a disincentive for rougher concrete pavement, the overall quality and smoothness is expected to improve with the new specifications. This will benefit Caltrans, as smoother concrete pavements require less smoothness-based maintenance and last longer in terms of MRI performance, which can save money over the pavement’s extended service life.

### **Estimated Impact to Caltrans and Contractor**

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

### **Impediments to Completion of Deliverables**

Concrete pavement smoothness is the highest priority of the Concrete 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 Cast In-Place Subtask Group will be responsible for the deliverables.

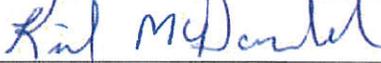
Pavement & Materials Partnering Committee  
 Scoping Document  
 Concrete Task Group/ Cast In-Place Pavement Sub-Task Group  
 Evaluate the New Concrete Pavement Smoothness Specification  
 November 28, 2018

**Recommendation and Approval**

This scoping document for *Evaluate the New Concrete Pavement Smoothness Specification* was prepared by the *Cast In-Place Concrete 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
 Keith Hoffman, Caltrans Task Group Chair	11/30/18	 Kirk McDonald, Industry Task Group Lead	11/30/18
 Kuo-Wei Lee, Caltrans Task Group Member	11/30/18	 Mark Hill, Industry Task Group Co-Member	11-30-18
 Blair Anderson, Caltrans Task Group Member	11/30/18		

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

Caltrans Name (Approval)	Date	Industry Name (Concurrence)	Date
 Sergio Aceves, Caltrans PMPC Executive Committee - Chair	12/11/18	Russ Snyder, Industry PMPC Executive Committee - Member	
 Ray Hopkins, Caltrans PMPC Executive Committee - Member	12/6/18	 Charley Rea, Industry PMPC Executive Committee - Member	12/6/18
 Tom Ostrom, Caltrans PMPC Executive Committee - Member	12/6/18		
 Dan Speer, Caltrans PMPC Executive Committee - Member	12/6/18		

Approval Date: \_\_\_\_\_