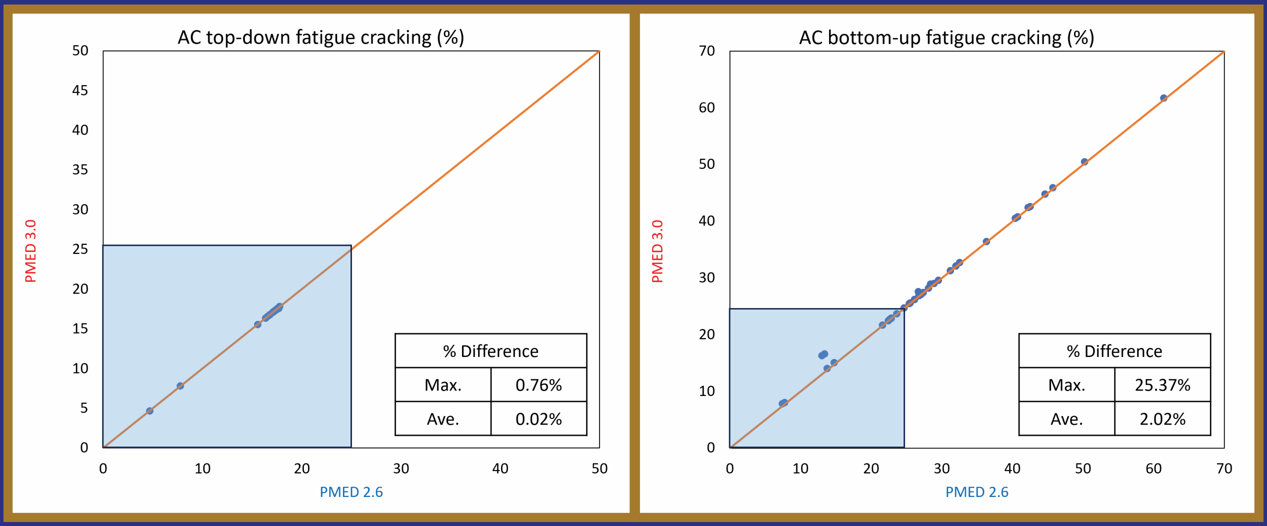
JOINT TRANSPORTATION RESEARCH PROGRAM

INDIANA DEPARTMENT OF TRANSPORTATION
AND PURDUE UNIVERSITY

Review of AASHTOWare Pavement ME Design Version 3.0



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16. Abstract

This study evaluated the differences between AASHTOWare Pavement ME Design (PMED) Version 2.6 and Version 3.0 using representative Indiana pavement structures and traffic conditions. PMED Version 3.0 introduces several major updates, including adoption of the MERRA-2 climate database, revised rigid pavement slab-base interaction models, updated calibration coefficients, and support for Multiple Stress Creep Recovery (MSCR)-based asphalt binder grading. Because the Indiana Department of Transportation (INDOT) currently uses PMED Version 2.6 with locally calibrated distress models, evaluation of Version 3.0 was necessary prior to implementation.

A total of 114 pavement design files representing full-depth asphalt pavements, asphalt overlay pavements, and Portland cement concrete (PCC) pavements, were analyzed using both PMED Version 2.6 and Version 3.0. Level 1 and Level 3 analyses were conducted, and predicted pavement distresses, including International Roughness Index (IRI), ruting, fatigue cracking, thermal cracking, faulting, and transverse cracking, were compared.

The results indicated that PMED Version 3.0 generally produces pavement performance predictions consistent with those from Version 2.6 for most distress indicators. The largest differences were observed in thermal cracking predictions, particularly for asphalt overlay pavements, where Version 3.0 generally predicted higher cracking levels than Version 2.6. For PCC pavements, Version 3.0 predicted lower IRI values and moderate differences in faulting and transverse cracking. MSCR-based asphalt binder grading was successfully implemented in Level 3 analyses; however, software errors occurred during Level 1 analyses.

Overall, the study demonstrated that PMED Version 3.0 Level 3 analyses can be implemented for pavement design applications in Indiana because the overall pavement performance prediction trends remain generally consistent with those from Version 2.6. However, implementation of Level 1 analyses is recommended after appropriate thermal cracking input properties are developed and validated through the ongoing SPR-4912 study.

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EXECUTIVE SUMMARY

Introduction

AASHTOWare Pavement ME Design (PMED) Version 3.0 introduces several major updates relative to PMED Version 2.6, including adoption of the MERRA-2 climate database, revised rigid pavement slab-base interaction models, updated calibration coefficients, and support for Multiple Stress Creep Recovery (MSCR)–based binder grading. Because the Indiana Department of Transportation (INDOT) currently uses PMED Version 2.6 together with locally calibrated distress models, evaluation of PMED Version 3.0 was necessary prior to statewide implementation.

The objective of this study was to evaluate the differences between PMED Version 2.6 and Version 3.0 using representative Indiana pavement structures and traffic conditions. The evaluation included full-depth asphalt pavements, asphalt overlay pavements, and Portland cement concrete (PCC) pavements using both Level 1 and Level 3 analyses.

Research Approach

A total of 114 pavement design files from INDOT projects were evaluated, including 39 full-depth asphalt pavements, 38 asphalt overlay pavements, and 37 PCC pavements. The selected projects represented a broad range of roadway classifications, traffic levels, and pavement structures throughout Indiana.

The original pavement design files were analyzed using both PMED Version 2.6 and Version 3.0. Predicted pavement distresses, including International Roughness Index (IRI), rutting, fatigue cracking, thermal cracking, faulting, and transverse cracking, were compared using parity plots and percentage difference calculations. Additional Level 1 analyses were conducted to evaluate the influence of higher-level material characterization on the updated prediction models incorporated into PMED Version 3.0.

Findings

The results demonstrated that PMED Version 3.0 generally produces pavement performance predictions consistent with those from PMED Version 2.6 for most distress indicators. For asphalt pavements, predictions of IRI, rutting, and fatigue cracking showed strong agreement between the two software versions for both Level 1 and Level 3 analyses.

The largest differences between the two versions were observed in thermal cracking predictions. For both full-depth and asphalt overlay pavements, PMED Version 3.0 generally predicted higher thermal cracking levels than Version 2.6. These differences are believed to result primarily from the updated MERRA-2 climate database and revised thermal restraint modeling incorporated into Version 3.0. The differences were particularly pronounced for asphalt overlay pavements and for Level 1 analyses, where Version 3.0 exhibited greater sensitivity to project-specific material and environmental conditions.

For PCC pavements, PMED Version 3.0 generally predicted lower IRI values than Version 2.6, with an average reduction of approximately 4.4%. Moderate differences were also observed in faulting and transverse cracking predictions. Sensitivity analyses indicated that increasing the PCC IRI calibration coefficient C4 from the default Version 3.0 value of 25.24 to approximately 31.1 produced IRI predictions more consistent with those from PMED Version 2.6.

The study also evaluated implementation of MSCR-based binder grading within PMED Version 3.0. MSCR-based binder inputs were successfully implemented in Level 3 analyses; however, software errors occurred during Level 1 analyses after entering MSCR test values.

Implementation

The results indicate that PMED Version 3.0, Level 3 analyses can be implemented for pavement design applications in Indiana because the overall pavement performance prediction trends remain generally consistent with those from PMED Version 2.6. However, additional evaluation and calibration of thermal cracking predictions are recommended, particularly for asphalt overlay pavements and Level 1 analyses.

Implementation of Level 1 analyses is recommended after appropriate thermal cracking material input properties are developed and validated through the ongoing SPR-4912 study. Additional local calibration and validation using Indiana pavement performance data are also recommended to improve compatibility between PMED Version 3.0 predictions and existing INDOT pavement design practices.

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1. INTRODUCTION

Mechanistic-empirical pavement design has become the standard approach for modern pavement analysis because it combines mechanistic response modeling with empirically calibrated pavement distress models. Compared to traditional empirical pavement design procedures, mechanistic-empirical methods provide improved capability for evaluating the effects of traffic loading, environmental conditions, material properties, and pavement structures on long-term pavement performance (Applied Research Associates [ARA], 2004). To support the implementation of mechanistic-empirical pavement design in the United States, the American Association of State Highway and Transportation Officials (AASHTO) developed the Mechanistic-Empirical Pavement Design Guide (MEPDG), which was later incorporated into AASHTOWare Pavement ME Design (PMED). PMED has since become one of the most widely used pavement design software platforms among state transportation agencies in the United States (AASHTO, 2022a).

Since its introduction, PMED has undergone multiple software updates intended to improve pavement performance prediction accuracy, material characterization, climate modeling, and overall usability. Major software updates can introduce changes to distress prediction algorithms, climate databases, calibration procedures, and mechanistic response models. Therefore, evaluation of an updated PMED version is important before implementation under agency-specific pavement design conditions. PMED Version 3.0 represents a major update to the software platform. Major modifications relative to PMED Version 2.6 include the transition from the desktop application to a web-based platform, adoption of the Modern-Era Retrospective Analysis for Research and Applications, Version 2 (MERRA-2) climate database, revised rigid pavement slab-base interaction models, and updated global calibration for rigid pavement designs (AASHTO, 2022b). MSCR-based asphalt binder grading was subsequently added to PMED through later software enhancements (AASHTO, 2024). MERRA-2 is a NASA atmospheric reanalysis dataset developed by the Global Modeling and Assimilation Office (Gelaro et al., 2017).

1.1 Problem Statement

The Indiana Department of Transportation (INDOT) currently uses PMED Version 2.6 together with locally calibrated pavement distress models developed through previous Joint Transportation Research Program (JTRP) studies. Because PMED Version 3.0 incorporates substantial modifications to climate databases, distress prediction algorithms, slab-base interaction models, and global calibration coefficients, implementation of the updated software without prior evaluation could introduce inconsistencies in pavement performance predictions and pavement design outcomes.

The updated MERRA-2 climate database, revised thermal restraint modeling, and modified Portland cement concrete (PCC) pavement response models may influence predictions of rutting, fatigue cracking, thermal cracking, roughness, faulting, and transverse cracking. In particular, thermal cracking predictions were expected to be highly sensitive to the updated environmental modeling incorporated in PMED Version 3.0. Similarly, modifications to PCC pavement structural response models may affect predictions of joint faulting, slab cracking, and International Roughness Index (IRI).

PMED Version 3.0 also introduces support for MSCR-based asphalt binder grading. However, the compatibility and reliability of this implementation within existing INDOT pavement design procedures had not been evaluated.

Accordingly, a comprehensive comparison of PMED Version 2.6 and Version 3.0 using representative Indiana pavement conditions was necessary prior to statewide implementation.

1.2 Research Objective

The primary objective of this study was to evaluate the compatibility and performance differences between PMED Version 2.6 and Version 3.0 using representative Indiana pavement structures and traffic conditions.

To achieve this objective, pavement performance predictions generated using PMED Version 2.6 and Version 3.0 were compared for full-depth asphalt pavements, asphalt overlay pavements, and PCC pavements. Both Level 1 and Level 3 analyses were conducted to evaluate the influence of updated software models under different material input levels.

The specific objectives of this study were to:

- Identify major changes incorporated into PMED Version 3.0 relative to Version 2.6;
- Compare predicted pavement distresses between PMED Version 2.6 and Version 3.0 for representative Indiana pavement designs; and
- Develop implementation recommendations for INDOT regarding future adoption and calibration of PMED Version 3.0.

2. RESEARCH APPROACH

A total of 114 pavement design files from INDOT projects were collected for evaluation in this study. The dataset included 39 full-depth asphalt pavements, 38 asphalt overlay pavements, and 37 PCC pavements, as summarized in Table 2.1. The selected projects represented a broad range of Indiana roadway classifications, traffic levels, and pavement structures.

Figure 2.1 presents the roadway classification distribution of the selected pavement designs. Approximately 43.0% of the

TABLE 2.1
Collected Indiana Pavement Designs.

Feature	Asphalt Pavement		Concrete Pavement	Total
	Full Depth	Overlay		
Number of designs	39	38	37	114
Interstate	18	2	29	49
US Route	4	11	8	23
State Route	17	25	0	42

projects are on interstate highways, 20.2% on U.S. routes, and the remaining 36.8% on state routes. To ensure that the comparison captured a representative range of traffic loading conditions, pavement designs representing multiple Truck Weight Road Groups (TWRGs) categories were included. Figure 2.2 and Figure 2.3 present the distributions of the selected pavement designs by TWRG category and design year, respectively.

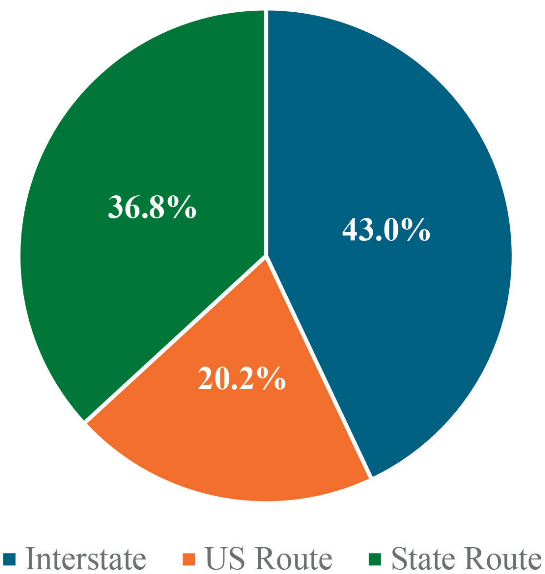

Figure 2.1 Distribution of Collected Pavement Designs by Roadway Classification.

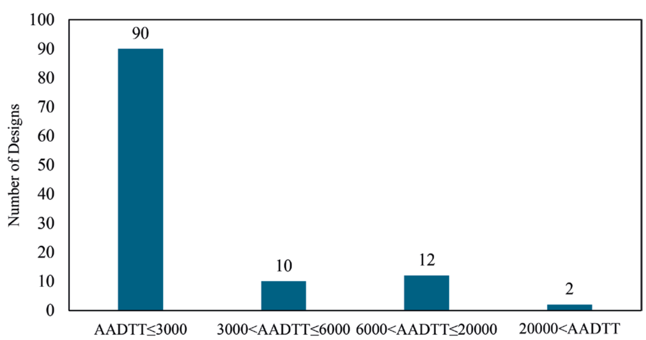

Figure 2.2 Distribution of Collected Pavement Designs by Truck Weight Road Group (TWRG).

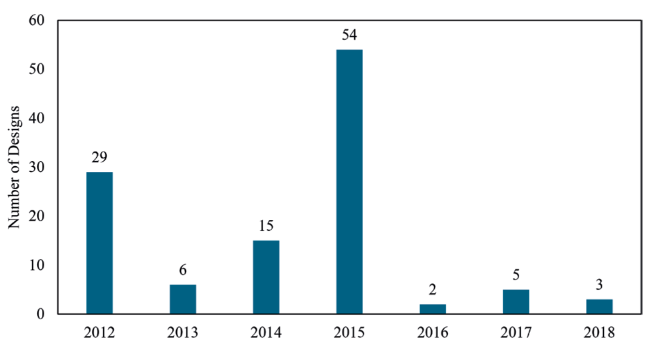

Figure 2.3 Distribution of Collected Pavement Designs by Design Year.

All pavement design files were originally developed using PMED Level 3 material inputs. For the Level 3 comparison, the original design files were analyzed directly in both PMED Version 2.6 and Version 3.0 without modification. This approach allowed direct evaluation of the influence of the software version changes while maintaining identical pavement structures, traffic inputs, climate locations, and material properties.

Additional analyses were conducted using Level 1 asphalt material inputs to evaluate the sensitivity of the updated prediction models to higher-quality material characterization. For full-depth asphalt pavements, Level 1 asphalt mixture properties were applied to all asphalt layers. For asphalt overlay pavements, Level 1 inputs were applied only to the newly constructed overlay layers, while the existing underlying pavement layers retained the original Level 3 inputs.

A 50-year analysis period was selected to maximize the visibility of long-term prediction differences between PMED Version 2.6 and Version 3.0. Although pavement designs are typically evaluated over shorter design lives, the extended analysis period allowed clearer identification of cumulative differences associated with updated climate databases, revised thermal restraint models, and modified distress prediction algorithms.

Predicted pavement performance indicators, including IRI, rutting, fatigue cracking, thermal cracking, faulting, and transverse cracking, were compared using parity plots and percentage difference calculations. This approach provided both visual and quantitative assessment of the consistency between the two software versions across multiple pavement types and analysis levels.

3. RESULTS AND DISCUSSION

PMED Version 3.0 incorporates several updates relative to PMED Version 2.6, including adoption of the MERRA-2 climate database, revised rigid pavement slab-base interaction models, updated calibration coefficients, and support for MSCR-based binder grading. These modifications may influence pavement performance predictions, particularly for thermal cracking and rigid pavement distress models.

To evaluate the practical impact of these updates under Indiana conditions, pavement performance predictions generated using PMED Version 2.6 and Version 3.0 were compared for multiple pavement types and analysis levels. The comparison focused on key pavement distress indicators, including IRI, rutting, fatigue cracking, thermal cracking, transverse cracking, and faulting.

3.1 Level 3 Analysis

3.1.1 Full-Depth Asphalt Pavement

Figure 3.1 through Figure 3.5 compare PMED Version 2.6 and Version 3.0 predictions for full-depth asphalt pavements using Level 3 inputs. The information box included in each figure summarizes the maximum percentage difference and average percentage difference between the two software versions.

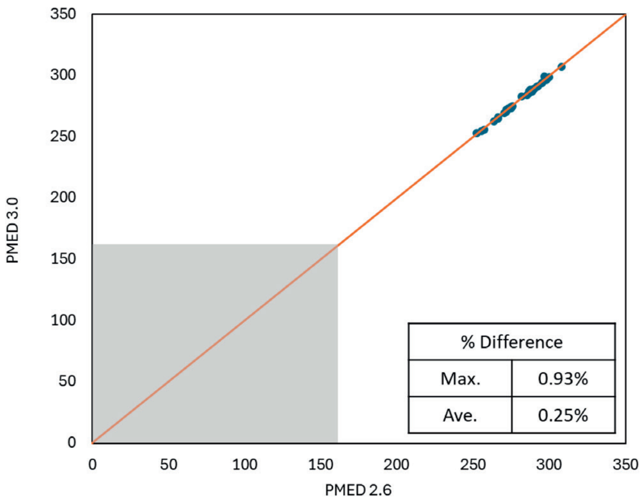

Figure 3.1 Comparison of Predicted IRI for Full-Depth Asphalt Pavements (Level 3 Analysis), in./mile.

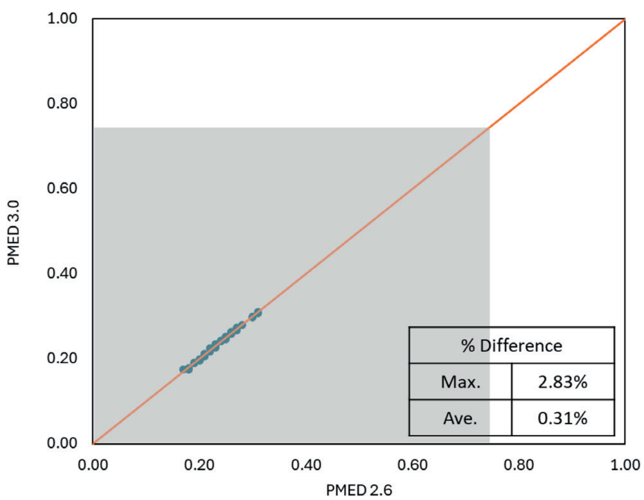

Figure 3.2 Comparison of Predicted Rutting for Full-Depth Asphalt Pavements (Level 3 Analysis), in.

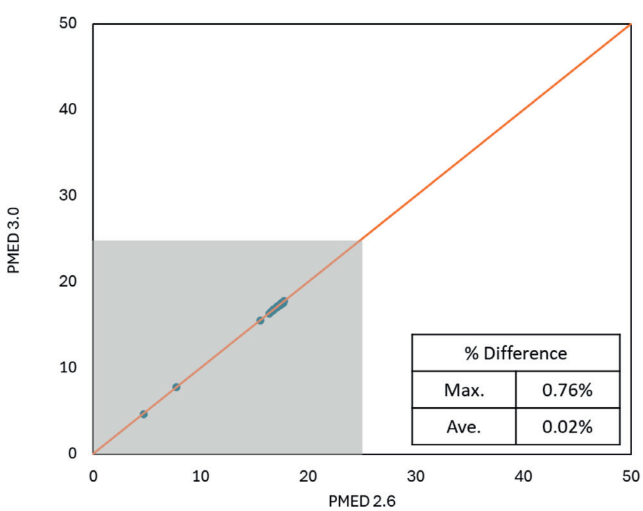

Figure 3.3 Comparison of Predicted Top-Down Fatigue for Full-Depth Asphalt Pavements (Level 3 Analysis), %.

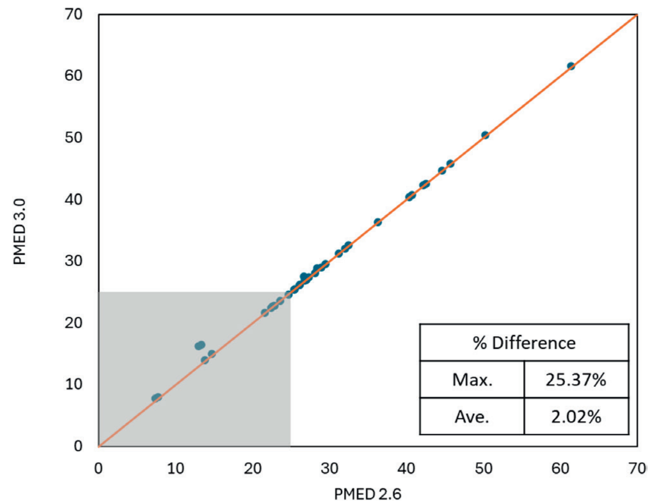

Figure 3.4 Comparison of Predicted Bottom-Up Fatigue Cracking for Full-Depth Asphalt Pavements (Level 3 Analysis), %.

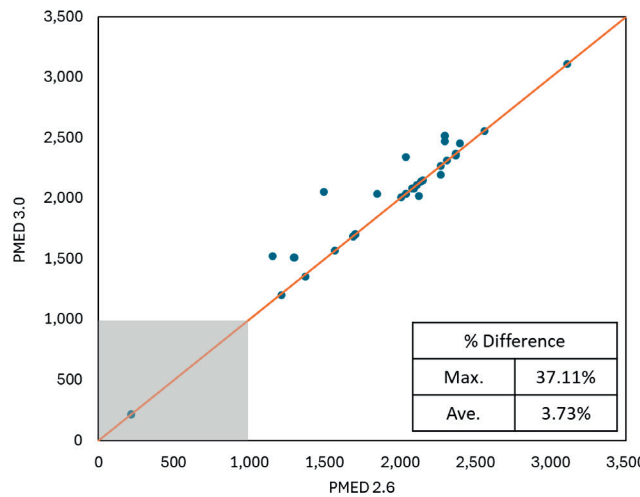

Figure 3.5 Comparison of Predicted Thermal Cracking for Full-Depth Asphalt Pavements (Level 3 Analysis), ft/mile.

The shaded region shown in the parity plots indicates that the predicted distress values remain within the corresponding design thresholds.

Overall, the two software versions produced similar predictions for IRI, rutting, and fatigue cracking. Most results closely followed the line of equality, indicating that the updated climate database and revised software framework implemented in PMED Version 3.0 have limited influence on these distress predictions under typical Indiana conditions.

The largest differences between the two versions were observed in thermal cracking predictions. PMED Version 3.0 generally predicted higher thermal cracking levels than Version 2.6, particularly over the extended 50-year analysis period used in this study.

These differences are likely associated with the change in climate inputs from the NARR dataset used in Version 2.6 to the MERRA-2 dataset used in Version 3.0, as well as revisions to the thermal cracking calculations incorporated into Version 3.0 (AASHTO, 2022b; Gelaro et al., 2017).

Although the predicted thermal cracking values differed between the two software versions, most predicted distress levels remained within acceptable design thresholds. The results indicate that PMED Version 3.0 maintains general compatibility with Version 2.6 for most asphalt pavement performance predictions, while exhibiting greater sensitivity to thermal cracking behavior.

3.1.2 Asphalt Overlay Pavements

Figure 3.6 through Figure 3.10 present the comparison results for asphalt overlay pavements using Level 3 inputs. Similar to the full-depth asphalt pavement analyses, PMED Version 2.6 and Version 3.0 produced comparable predictions for IRI, rutting, and fatigue cracking.

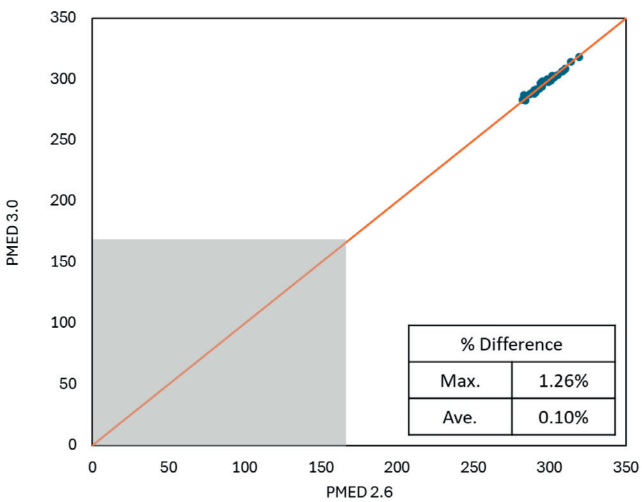

Figure 3.6 Comparison of Predicted IRI for Asphalt Overlay Pavements (Level 3 Analysis), in./mile.

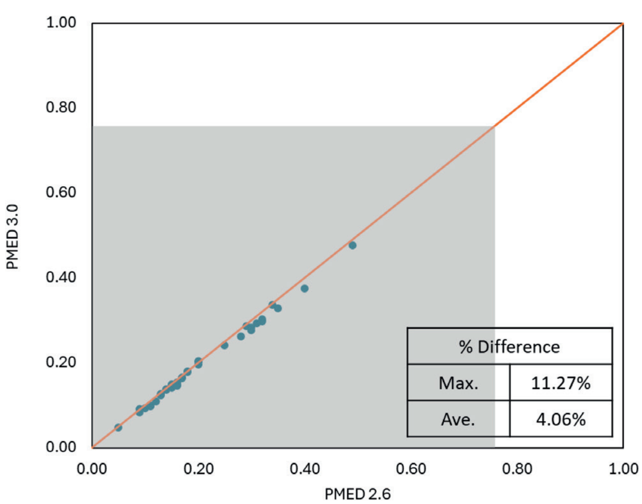

Figure 3.7 Comparison of Predicted Rutting for Asphalt Overlay Pavements (Level 3 Analysis), in.

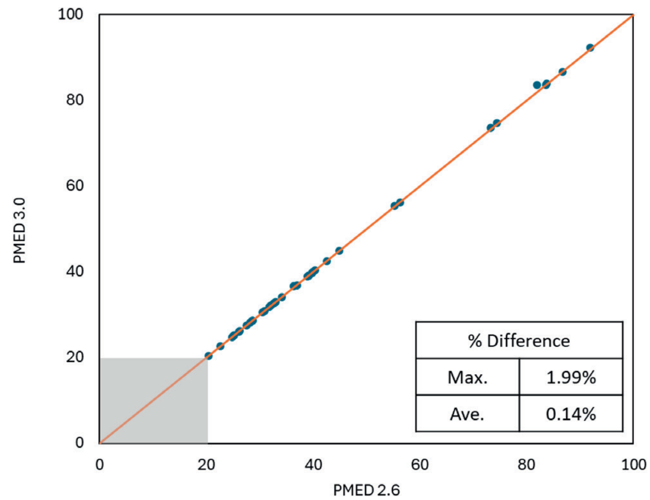

Figure 3.8 Comparison of Predicted Fatigue Cracking for Asphalt Overlay Pavements (Level 3 Analysis), %.

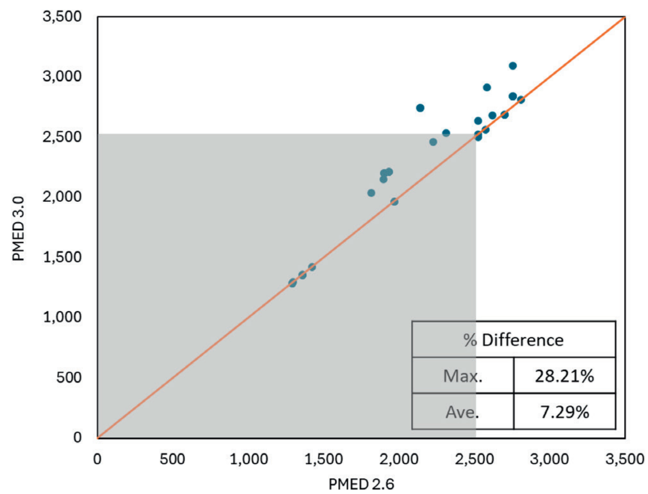

Figure 3.9 Comparison of Predicted Transverse Cracking for Asphalt Overlay Pavements (Level 3 Analysis), ft/mile.

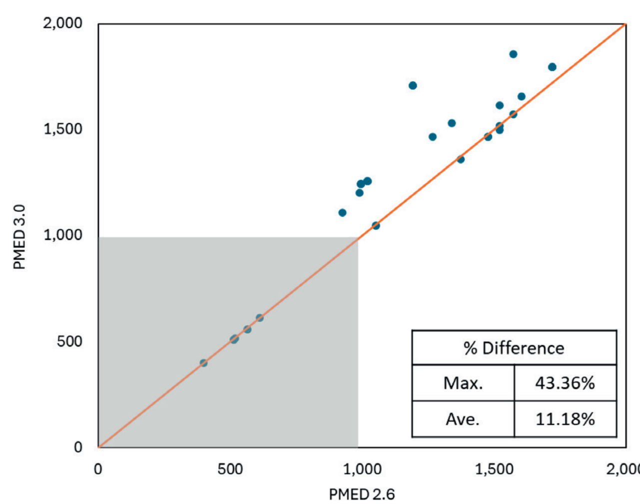

Figure 3.10 Comparison of Predicted Thermal Cracking for Asphalt Overlay Pavements (Level 3 Analysis), ft/mile.

Several projects exhibited percentage differences greater than 10% for rutting predictions. However, these differences correspond to very small baseline rutting values, and the maximum absolute difference was approximately 0.03 in. Consequently, the practical effect on pavement design is negligible.

More substantial differences were observed for thermal and transverse cracking predictions. PMED Version 3.0 generally predicted higher cracking levels than PMED Version 2.6.

The increased cracking predictions are likely related to revisions in the overlay thermal restraint modeling incorporated into PMED Version 3.0. In Version 2.6, overlays were modeled closer to a free thermal contraction condition, which reduced predicted thermal tensile stresses within the overlay layer. Version 3.0 appears to account more explicitly for restraint effects caused by interaction between the overlay and the underlying pavement structure, resulting in higher predicted tensile stresses and increased cracking.

The influence of the revised restraint model became more pronounced over the extended analysis period because thermal damage continued to accumulate with time. Despite these differences, many predicted distress values remained within acceptable design limits. However, the results suggest that overlay pavement designs may require additional evaluation and local calibration when implementing PMED Version 3.0 under Indiana conditions.

3.1.3 Portland Cement Concrete Pavements

Figure 3.11 through Figure 3.13 compare PMED Version 2.6 and Version 3.0 predictions for PCC pavements using Level 3 inputs.

PMED Version 3.0 generally predicted lower IRI values than Version 2.6, with an average reduction of approximately 4.4%. Faulting predictions showed moderate variation between the two versions, while larger variability was observed for transverse cracking.

The differences are likely associated with updates to the rigid pavement slab-base interaction models, revised calibration coefficients, and updated climate inputs incorporated into PMED Version 3.0. The revised slab-base interaction treatment in Version 3.0 incorporates the NCHRP 1-51 research on interaction between PCC slabs and underlying layers (Khazanovich et al., 2017; AASHTO, 2022b). Sensitivity analyses indicated that increasing the PCC IRI calibration coefficient C4 from the default Version 3.0 value of 25.24 to approximately 31.1 produced IRI predictions more consistent with those from Version 2.6 for the pavement sections evaluated in this study.

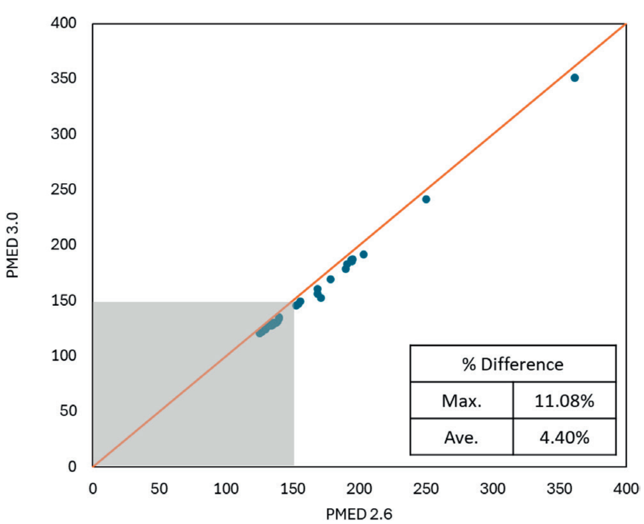

Figure 3.11 Comparison of Predicted IRI for PCC Pavements (Level 3 Analysis), in./mile.

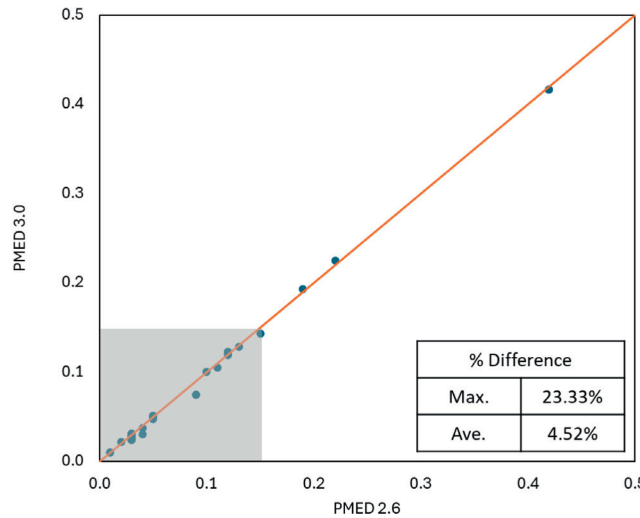

Figure 3.12 Comparison of Predicted Joint Faulting for PCC Pavements (Level 3 Analysis), in.

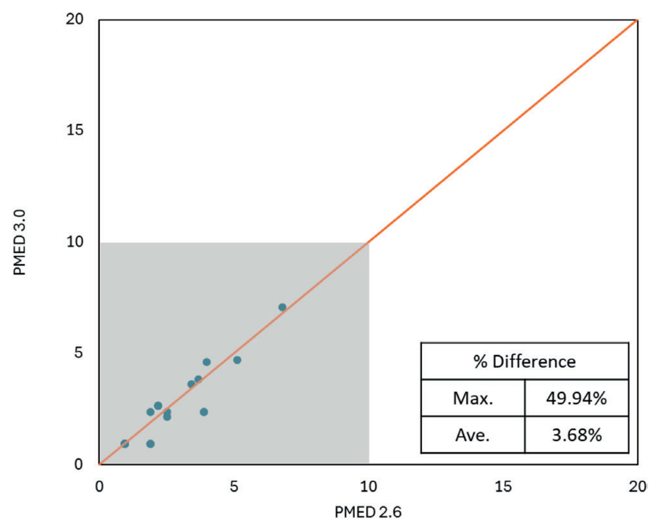

Figure 3.13 Comparison of Predicted Transverse Cracking for PCC Pavements (Level 3 Analysis), %.

Although moderate differences were observed for several distress predictions, most values remained within acceptable design thresholds. Overall, the results indicate that PMED Version 3.0 produces rigid pavement performance predictions generally comparable to those from Version 2.6, while additional local calibration may improve prediction consistency under Indiana conditions.

3.2 Level 1 Analysis

The Level 1 analyses produced trends generally consistent with those observed in the Level 3 analyses. Predictions of IRI, rutting, and fatigue cracking remained relatively similar between PMED Version 2.6 and Version 3.0 for both full-depth and overlay asphalt pavements.

The most significant differences again occurred in thermal cracking predictions. However, the differences observed using Level 1 inputs were substantially larger than those observed in the Level 3 analyses.

3.2.1 Full-Depth Asphalt Pavements

Figure 3.14 through Figure 3.18 compare Level 1 predictions for full-depth asphalt pavements.

PMED Version 2.6 generally produced thermal cracking predictions that stabilized shortly after cracking initiation. Once

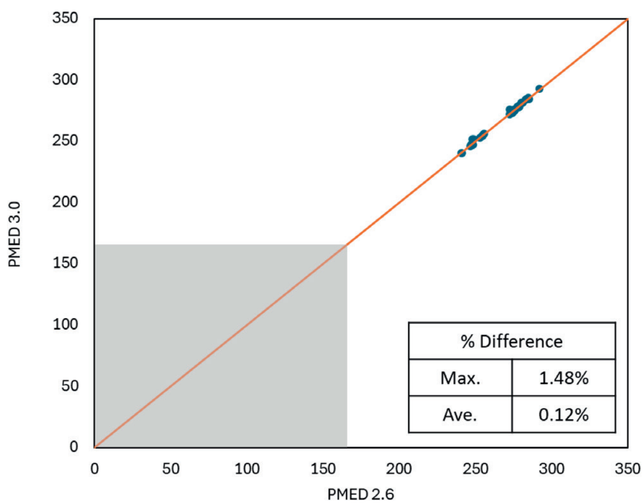

Figure 3.14 Comparison of Predicted IRI for Full-Depth Asphalt Pavements (Level 1 Analysis), in./mile.

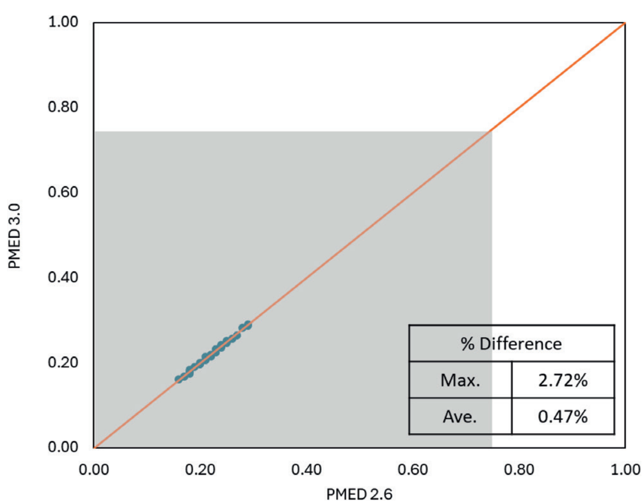

Figure 3.15 Comparison of Predicted Rutting for Full-Depth Asphalt Pavements (Level 1 Analysis), in.

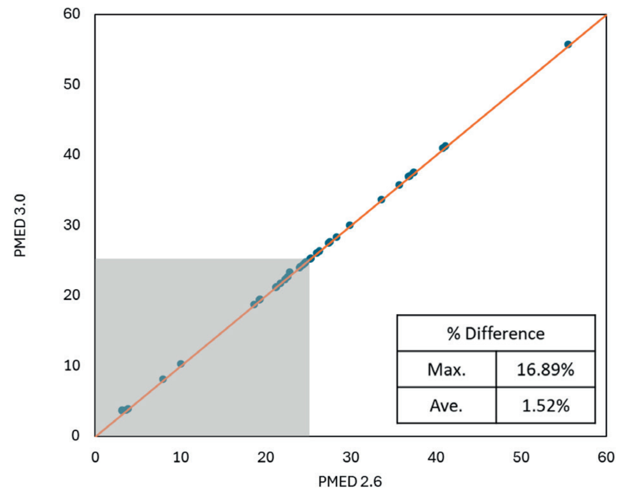

Figure 3.16 Comparison of Predicted Bottom-Up Fatigue Cracking for Full-Depth Asphalt Pavements (Level 1 Analysis), %.

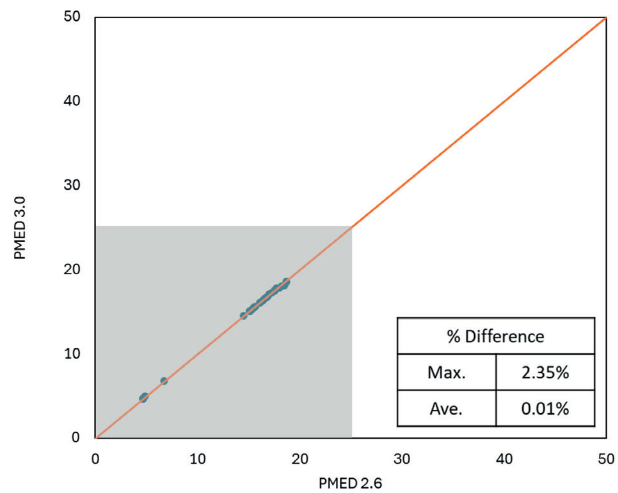

Figure 3.17 Comparison of Predicted Top-Down Fatigue Cracking for Full-Depth Asphalt Pavements (Level 1 Analysis), %.

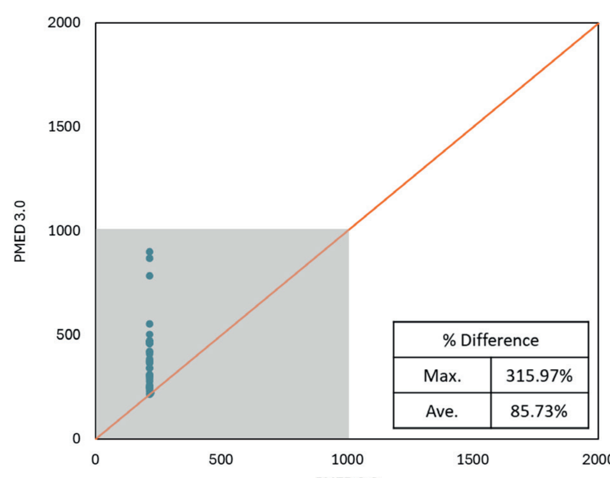

Figure 3.18 Comparison of Predicted Thermal Cracking for Full-Depth Asphalt Pavements (Level 1 Analysis), ft/mile.

cracking developed during an early low-temperature event, predicted cracking levels remained nearly constant throughout the remainder of the analysis period.

In contrast, PMED Version 3.0 exhibited progressively increasing thermal cracking over time. The revised model appears to allow thermal damage to accumulate during repeated seasonal loading cycles, resulting in continued cracking growth throughout the analysis period.

An additional observation was that PMED Version 2.6 frequently produced nearly identical thermal cracking predictions for projects with substantially different pavement structures, traffic levels, and environmental conditions. PMED Version 3.0 demonstrated greater variability and sensitivity to project-specific inputs, suggesting improved responsiveness to material characterization and environmental loading.

3.2.2 Asphalt Overlay Pavements

The Level 1 overlay analyses produced trends similar to those observed for full-depth asphalt pavements. Predictions of IRI, rutting, and fatigue cracking remained generally consistent between the two software versions, while thermal cracking predictions differed substantially.

PMED Version 3.0 again predicted progressively increasing thermal cracking over time because of the cumulative damage behavior incorporated into the revised thermal cracking model. The differences were more pronounced for overlays, likely because the updated restraint modeling increased the influence of interaction between the overlay and underlying pavement structure.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

This study evaluated differences between AASHTOWare PMED Version 2.6 and Version 3.0 using representative Indiana pavement structures and traffic conditions. The evaluation included Level 1 and Level 3 analyses for full-depth asphalt pavements, asphalt overlay pavements, and PCC pavements.

Overall, PMED Version 3.0 produced pavement performance predictions generally consistent with those from Version 2.6 for most distress indicators. For asphalt pavements, predictions of IRI, rutting, and fatigue cracking showed strong agreement between the two software versions for both Levels 1 and 3 analyses.

The largest differences between the two versions were consistently observed in thermal cracking predictions. PMED Version 3.0 generally predicted higher thermal cracking levels than Version 2.6 for both full-depth and overlay asphalt pavements. These differences are likely associated with the updated MERRA-2 climate database and revisions to the thermal cracking and thermal restraint models incorporated into Version 3.0.

The influence of the revised thermal cracking models became more pronounced over the extended 50-year analysis period because thermal damage continued to accumulate with repeated environmental loading cycles. However, the practical impact under typical pavement design lives is expected to be less significant.

The Level 1 analyses showed that PMED Version 3.0 is substantially more sensitive to project-specific material characterization and environmental loading conditions than Version 2.6. In particular, Version 2.6 frequently produced nearly identical thermal cracking predictions for projects with different pavement structures and traffic levels, whereas Version 3.0 produced more variable and progressive thermal cracking behavior.

For PCC pavements, PMED Version 3.0 generally predicted lower IRI values than Version 2.6, with an average reduction of approximately 4.4%. Moderate differences were also observed for faulting and transverse cracking predictions. Sensitivity analyses indicated that increasing the PCC IRI calibration coefficient C4 from 25.24 (default value) to approximately 31.1 produced IRI predictions more consistent with those from Version 2.6.

The study also evaluated implementation of MSCR-based asphalt binder grading within PMED Version 3.0. MSCR-based binder inputs were successfully implemented in Level 3 analyses; however, software errors occurred during Level 1 analyses after entering MSCR test values.

4.2 Recommendations

Based on the findings of this study, the following recommendations are provided for INDOT regarding implementation of PMED Version 3.0:

- PMED Version 3.0 Level 3 analyses are recommended for pavement design applications because overall pavement performance predictions remain generally consistent with those from Version 2.6.
- Implementation of Level 1 analyses is recommended after appropriate material input properties are developed and validated through the ongoing SPR-4912 study.
- For PCC pavement IRI predictions, adjustment of the calibration coefficient C4 from the default Version 3.0 value of 25.24 to approximately 31.1 is recommended to improve consistency with PMED Version 2.6 predictions.
- Additional evaluation of thermal cracking predictions using Indiana field performance data is recommended to better understand the influence of the updated MERRA-2 climate database and revised thermal restraint modeling incorporated into PMED Version 3.0.
- Overlay asphalt pavement designs should receive particular attention because PMED Version 3.0 predicts higher thermal cracking due to revised representation of pavement restraint effects.
- MSCR-based asphalt binder grading may be used for Level 3 analyses; however, additional software verification and refinement are recommended before Level 1 MSCR analyses are implemented for pavement design applications.
- Continued validation of PMED Version 3.0 using Indiana pavement performance data is recommended to support future local calibration refinement and long-term implementation.

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On March 11, 1937, the Indiana Legislature passed an act which authorized the Indiana State Highway Commission to cooperate with and assist Purdue University in developing the best methods of improving and maintaining the highways of the state and the respective counties thereof. That collaborative effort was called the Joint Highway Research Project (JHRP). In 1997 the collaborative venture was renamed as the Joint Transportation Research Program (JTRP) to reflect the state and national efforts to integrate the management and operation of various transportation modes.

The first studies of JHRP were concerned with Test Road No. 1—evaluation of the weathering characteristics of stabilized materials. After World War II, the JHRP program grew substantially and was regularly producing technical reports. Over 1,600 technical reports are now available, published as part of the JHRP and subsequently JTRP collaborative venture between Purdue University and what is now the Indiana Department of Transportation.

Free online access to all reports is provided through a unique collaboration between JTRP and Purdue Libraries. These are available at docs.lib.purdue.edu/jtrp/.

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