

Pavement Management Section

WSDOT HQ Pavements Branch
8/4/2014

Pavement Condition Trend

This performance measure documents the statewide pavement condition as represented by the pavement structural condition (cracking, faulting, patching, etc.), rutting, and ride (smoothness) measurements on the state highway network. This measure includes all pavement types: chip seal, asphalt, and concrete. These condition measures are used to characterize each pavement section in to one of five categories: very good, good, fair, poor, and very poor. A pavement section is determined to be “due” for rehabilitation when it has reached the “Fair” category based on one or more condition measures. The chart illustrates the number of lane miles of pavement in each of the five categories from 2001 to 2012. WSDOT’s goal is to limit approximately 10% of the lane miles of pavement in the “Poor” or “Very Poor” category¹. The 2012 condition data (rated and analyzed during 2012-2013) has been added and shows that the poor pavement (“Poor” and “Very Poor” categories) has improved slightly to 8.0% from 9.5% in 2011.

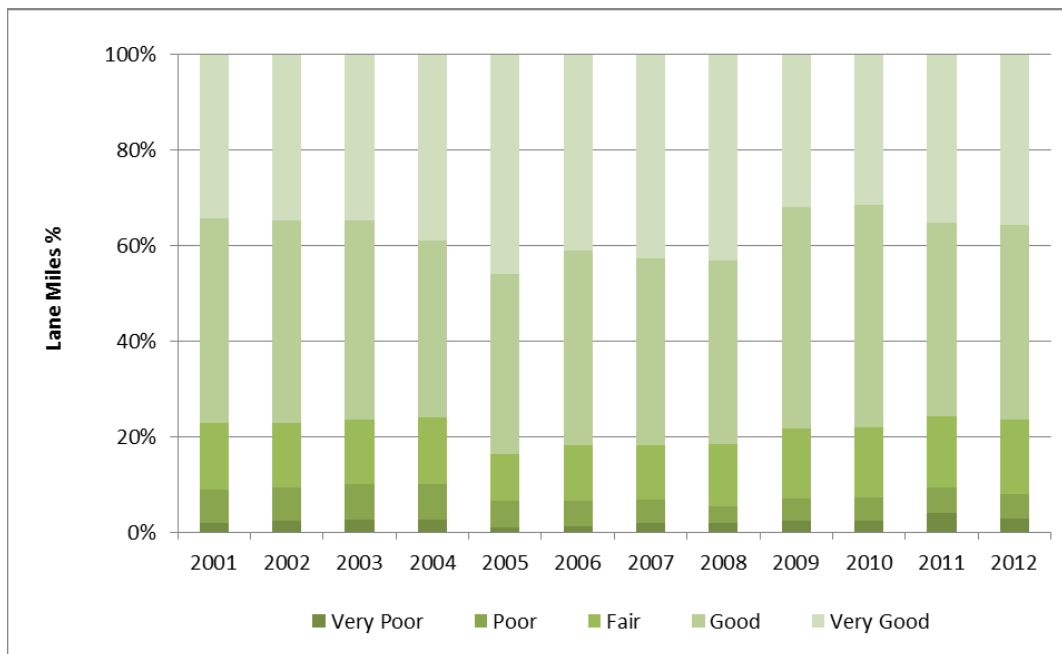


Figure 1 - Pavement Condition

¹ Except for those sections of pavements that are intentionally delayed due to upcoming reconstruction or other major construction work.

The following table represents the above figure and illustrates the number of good (pavements in very good, good and fair condition) and poor (pavements in poor and very poor condition) lane miles for all pavement types.

| Year | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 ² | 2012 ² |
|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------------------|-------------------|
| Good | 16,186 | 16,197 | 15,916 | 15,965 | 16,617 | 16,743 | 16,160 | 16,403 | 15,784 | 15,918 | 10,963 | 11,463 |
| Poor | 1,578 | 1,659 | 1,787 | 1,797 | 1,162 | 1,153 | 1,162 | 922 | 1,181 | 1,260 | 1,147 | 1,003 |

Figure 2 - Lane miles measured in Good (Very Good, Good and Fair) vs. lane miles measured in Poor (Poor, Very Poor) condition.

QA/QC in Pavement Rating

This performance measure attempts to quantify the accuracy of annual pavement condition surveys using statistical methods. One of the concerns WSPMS users have raised in the past has been that, in some cases, the survey results do not accurately reflect the condition of the pavement section. After the rating crew has finished rating a “set” (approximately 100 miles of roadway), about five random sample sections, each approximately 1 mile long, are selected within this set and are rated again (“sample” rating) by a different rater than the one who performed the “production” rating. The Pavement Structural Condition (PSC), a combined index of the various distresses on the pavement surface, is then computed using both the “production” rating and the “sample” rating and are then compared for any statistical differences. For the 2012-2013 pavement rating, 421 sample sections (each approximately 1 mile long) out of a total of approximately 6,000 miles of rated roadway were considered. The “production” and “sample” ratings were tested for differences using paired t-test and Wilcoxon signed rank test and both tests indicated that there are no significant differences between the two ratings.

The following two figures show graphically the differences between the “production” and “sample” rating. Out of the 386 sample sections considered, 365 sections (94.6%) had a PSC difference of less than 10 points and 21 sections (5.4%) had a PSC difference of more 10 than points. In Figure 2, the solid line represents the line of equality (R-squared = 92.1%) and the dashed lines represent ± 10 PSC points difference.

² Due to budget restrictions, Chip Seal pavements were not rated and excluded

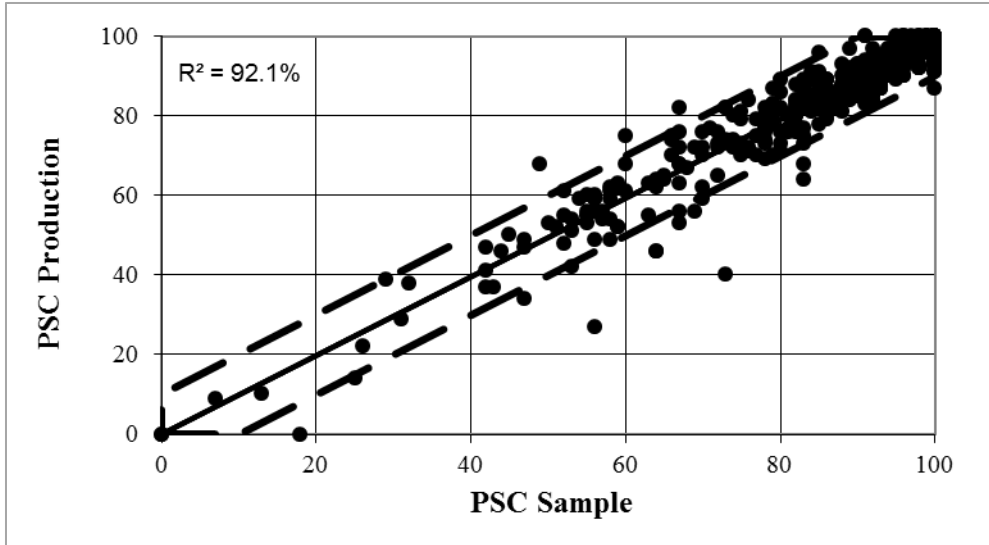


Figure 3 - PSC Comparison

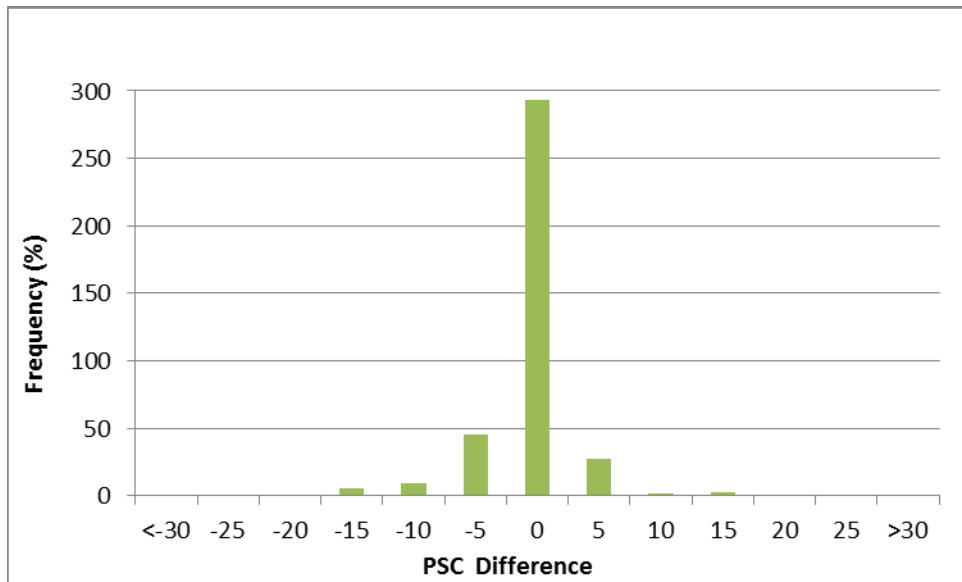


Figure 4 - Histogram of Differences in PSC between Production and Sample Rating