Level-1 / PBBT Analysis Tool

Introduction

The Level-1/PBBT Analysis Tool (LPAT) was designed to assist in the analysis of North American Standard Level-1 Inspection and Performance-Based Brake Test (PBBT) results collected through various research efforts at the Federal Motor Carrier Safety Administration's Commercial Motor Vehicle Roadside Technology Corridor (CMVRTC). LPAT is a work in progress developed to streamline the most common analyses performed by ORNL researchers.

The data incorporated into the tool includes the results of Level-1 inspections with accompanying PBBT test results. This data was collected over the course of several research efforts at the CMVRTC since the installation of the PBBT at the Greene County Inspection Station. This tool provides access to a rich set of data allowing comparisons to be made between out-of-service (OOS) rates for the PBBT and Level-1 inspection; it also makes it possible to determine the effect of various factors (such as vehicle age and weight) on OOS rates.

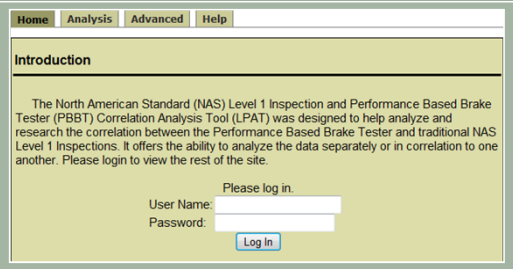

Figure 1 – Web Application Home Page

Overview of Analyses

The program allows the user to select a range of criteria to define data for analysis. (Fig. 2)

- Specific test periods
- Number of axles
- Option to consider specific wheel-ends only
- Individual violations
- Tractor model year
- Brake efficiency
- Overall result (pass or fail) for PBBT test and/or NAS Level 1inspection

The analysis returns the number of vehicles and the percentage of the data that meets the criteria.

There are a number of pre-defined analyses available to dynamically generate graphs and charts that explore trends in the correlation between the NAS Level 1 and PBBT. (Fig 3-5). There is also the ability to generate comma separated files from records in the database for any other analysis that is not supported by the tool.

Benefits

- Identification of trends between variables collected in the research
- Support for the use of PBBT tests in place of, or in conjugation with, NAS inspections.
- Simplification of research analyses

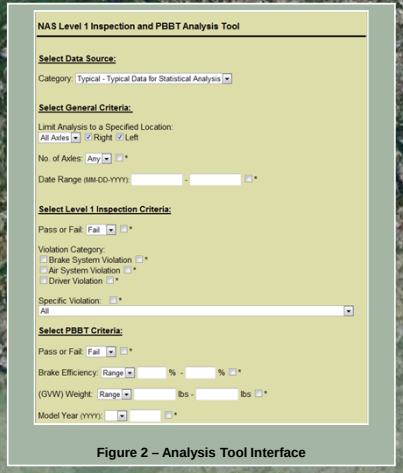

Figure 2 – Analysis Tool Interface

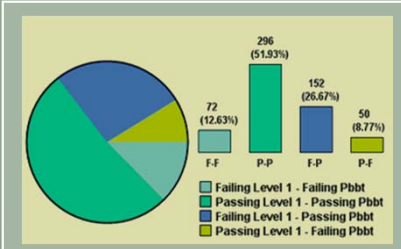

Figure 3 – Level 1 / PBBT Correlations

Figure 3 shows the results from a pre-defined analysis on the NAS Level 1 Inspection and PBBT Correlation. From this analysis, the PBBT performs the same as a Level-1 inspection 64.56% of the time.

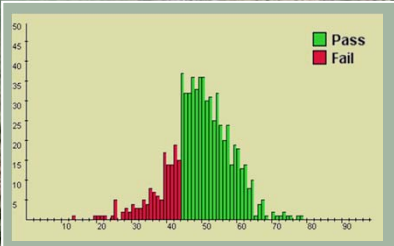

Figure 4 – Overall Brake Efficiencies

Figure 4 shows the overall brake efficiencies for all typical PBBTs collected. Efficiencies are rounded up and as the color indicates, efficiencies below 43.5% are considered failing.

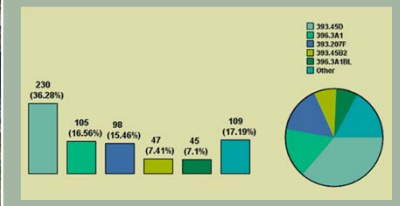

Figure 5 – Common Air Violations

Figure 5 shows the top five air violations using FMSCA regulation codes for NAS Level 1 Inspections. The most common air violation is a result of air hose leaks.

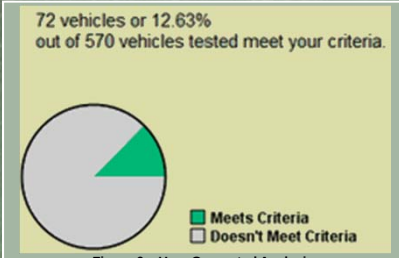

Figure 6 – User Generated Analysis

Figure 6 shows the results from a dynamically generated user analysis on the failing percentage of NAS Level 1 Inspections with brake violations. The user can generate results for specific wheel end or the overall vehicle.

Commercial Motor Vehicle Roadside Technology Corridor

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