I. INTRODUCTION

Highway maintenance tasks are complex and diversified. Highway Operations/maintenance personnel are required daily to make decisions that ultimately influence the level and effectiveness of maintenance service and the associated cost of that service. While the management of highway maintenance is not an exact science, most maintenance tasks can be categorized and completed in a standardized manner.

II. PURPOSE

The Maintenance Management System (MMS) was designed to ensure a standardization of maintenance work methods, as well as to achieve a uniform degree of quality maintenance service at the least cost, statewide. The Division's MMS is a true managerial system, as it makes available the necessary tools to perform the management functions of:

- Planning
- Organizing
- Directing
- Controlling
The Maintenance Performance Standards are a collection of the recognized tasks or activities as associated with the maintenance of highways. All true management systems must have a "standard" by which the actual is compared. The Performance Standards are those "standards" for maintenance tasks.

For ease of reference, the Maintenance Performance Standards are generally grouped into categories. Generally, these categories are composed of similar work types such as:

- Bituminous Pavement Maintenance
- Portland Cement Concrete Pavement Maintenance
- Unpaved Surface Maintenance
- Drainage Maintenance
- Roadside Maintenance
- Snow Removal and Ice Control
- Traffic Services
- Bridge Maintenance
- Other Maintenance
- Service Functions

The Maintenance Performance Standards are contained in the Maintenance Performance Standards Manual. Each maintenance activity or task, has one or more pages devoted to that specific activity in the Performance Standards Manual. The three digit code assigned to each Performance Standard is the same corresponding code assigned to the Activity Codes utilized by the REMIS Accounting System. These three digit codes are in fact the coding utilized as REMIS input when reporting labor, equipment and materials expenditures by work type.

The Maintenance Performance Standards are a very detailed version of explaining each maintenance task. They give such vital information as:

- What is the task?
- Why perform the task?
- When do you perform the task?
- How do you perform the task?
- What resources (labor, equipment and materials) are needed to perform the task?
- What is the daily production to be expected?
- How many man-hours to produce one unit (productivity)?
- How to report the task when completed?
• Where can one find Technical References regarding the task?

• What are the recommended work methods?

The Maintenance Management System utilized the Performance Standards data in the form of a computer file. Whenever actual work reported data is input into the MMS via the REMIS Reporting System, the actual data is "bumped" or compared against the Standard data for each maintenance activity. The Management Control Reports (Refer to Chapter 8) then allow the Maintenance Supervisor to see how efficient (productivity wise) the work crews actually are in relationship to the pre-set standard.

Similarly, the Standards are priced via the Basic Expense Standard (BES) File (Refer to Chapter 6) which allows the maintenance manager to compare the actual costs to the standard costs of the maintenance operation via the Management Control Reports. The Maintenance Performance Standards are also most beneficial to the Maintenance Supervisor when preparing the organizational Maintenance Plan. The Maintenance Plan (Refer to Chapter 6) is actually the organization supervisor's maintenance goals as approved by both District and Central Headquarters' managers, developed as work units of each activity or Maintenance Standard.

IV. DETAILED EXPLANATION OF EACH SECTION OF THE MAINTENANCE PERFORMANCE STANDARDS

Republished: 11/1/2000 Effective: 7/1/89

The following provides a detailed explanation of each section of the Maintenance Performance Standard.

Activity Name: Describes the applicable work type/activity or task the Performance Standard has been established for.

Activity No: The three-digit numeral assigned to the particular work type or task. This number is always the same as the REMIS Accounting Activity Code Numbers for all transaction types.

Description and Purpose: A brief narrative which describes the specific maintenance task and also provides an explanation of why the work is necessary.

Performance Criteria: Details the best timing for performance of the specific maintenance task. This can be in the form of: specified seasons; before or after other maintenance tasks are completed; at the direction of District management; under certain weather conditions; at certain temperature ranges, etc. Within the Performance Criteria section is the Performance Schedule, which is a calendar by month, denoting the month(s) to perform the specific tasks, and the month(s) of possible performance.

Crew Size: This portion of the Performance Schedule lists by employee classification, the type and quantity of work force deemed necessary to complete the daily production as noted on the standard.

Equipment: Lists the types (by class number and description) as well as the quantity of each type of equipment required to complete the task. Occasionally equipment will be listed as optional. The Performance Standard attempts to list every possible equipment type that might be needed to complete the task.

Materials: Lists the various materials that will be needed to perform the specific maintenance task.

Accomplishment: This particular section of the Performance Standard is divided into
three (3) very important segments:

**Unit** - Lists the method by which the accomplishment is to be reported; tons of pre-mix, tons of aggregate, linear feet, etc.

**Daily Production** - This illustrates the expected amount (standard quantity) that should be accomplished with the standard crew size and standard equipment compliment. Each Performance Standard lists a range for this data; that range is always 75% to 110% of the Standard Daily Production. To calculate the Standard Daily Production figure you can divide the smaller number by .75 or divide the larger number by 1.10. Refer to Exhibit I for Activity 201, the range is 9 - 13.2 accomplishments or tons of pre-mix. To calculate the Standard Daily Number:

\[
9 \times .75 = 12 \\
\text{or} \\
13.2 \times 1.10 = 12
\]

**Productivity (Man-Hours/Unit)** - This is very important data for the Maintenance Supervisor. This is the data utilized by the supervisor to measure the organizational crews' efficiency against the standard. This number represents how many man-hours must be expended to accomplish one unit. In the example of Activity 201 (Exhibit I) the Standard Productivity Number is 4.0. That number is achieved by dividing the man-hours required by the Performance Standard to meet the Standard Daily Production. Refer to Exhibit I for Activity 201, you will note the standard lists a total crew size of 6 which equates to 48 man-hours (6 x 8 = 48). Remember the Standard Daily Production Number is 12. Thus Standard Productivity is calculated as:

\[
48 \text{ Man-Hours} , 12 \text{ Accomplishments} = 4 \text{ Man-Hours/Unit}
\]

The MMS Management Control Reports lists each organization's actual productivity as compared with the Standard Productivity for all activities. This comparison is a vital management tool that the organizational supervisor can gauge the organizational crew's efficiency with the Standard.

The following, (See Exhibit II.) represents the reverse side or page 2 of the Performance Standard:

**Work Methods and Technical Reference**

Technical references where applicable are listed for additional reference. Generally these technical references list the appropriate Maintenance Manual Chapter and any other reference guides. Also step by step recommended work methods are listed.

**Exhibit III** represents page 3 of the Performance Standard and addresses the following:

**General Notes**

This portion serves as a reminder of certain facts regarding each maintenance task. Usually safety, personnel qualifications and the need for hand tools or other auxiliary tools are listed below.
Reporting Notes

Most Performance Standards utilize this area to remind that flaggers for all activities are reported under a separate activity.

Planning Notes

Some Performance Standards use this segment to advise the ideal or standard material quantity per accomplishment unit, for each of the material types listed under the Materials Section.

All Highway Operations/maintenance personnel, whether managers or non-managers involved in planning, scheduling, reporting or controlling maintenance tasks, must uniformly understand and become familiar with the Maintenance Performance Standards. These Maintenance Performance Standards are utilized by Central Office managers for budgeting and controlling the Maintenance Operation. District Management utilize the Performance Standards for planning and controlling the Maintenance Operation. Supervisors and Maintenance Crew Leaders will find the Performance Standards most beneficial in scheduling and controlling the Maintenance Operation and of course, the REMIS entry clerks utilize the Performance Standards to report the Maintenance Operation.

Each level of management that utilized the Maintenance Performance Standards will create a more systematic, more plan-able, more consistent working environment within the Maintenance Operation. This results in greater crew efficiency and a standardized Maintenance Program with the least consumption of available resources; that is the ultimate goal of the Maintenance Performance Standards and the Maintenance Management System.

V. EXHIBIT

Republished: 11/1/2000 Effective: 7/1/89

HIGHWAY OPERATIONS DIVISION - PERFORMANCE STANDARDS

(FORM SM-30) - ACTIVITY 201 - PAGE 1 OF 3
DESCRIPTION & PURPOSE: Repair of bituminous pavements, shoulders and approaches with premix to correct potholes, edge failures, upheaval, settlements, cracking, raveling and base failures; to prevent further deterioration, eliminate safety hazard, improve riding quality and restore proper drainage. The repair and construction of asphaltic paved sections to provide adequate drainage and erosion control.

PERFORMANCE CRITERIA: All permanent repairs should be scheduled and performed as soon as possible when weather conditions permit. The type of maintenance performed will be dictated by the condition of pavement, shoulders and approaches when hot-mix is used. Base temperature should be above 40°F and the surface dry.

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<th>Quantity</th>
<th>Description/Class</th>
<th>Quantity</th>
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<tr>
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<td>040-Sweeper (Opt.)</td>
<td>1</td>
</tr>
<tr>
<td>Operator</td>
<td>3</td>
<td>203-Crew Slop Muck Truck</td>
<td>1</td>
</tr>
<tr>
<td>Laborers/Craftsmen</td>
<td>2</td>
<td>253-Tilt Trailer (Opt.)</td>
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<tr>
<td></td>
<td></td>
<td>371/375-Dump Truck</td>
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<td></td>
<td></td>
<td>410-Gradall (Opt.)</td>
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<tr>
<td></td>
<td></td>
<td>562-Asphalt Storage Tr. (Opt.)</td>
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<tr>
<td></td>
<td></td>
<td>512-Distributor</td>
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<tr>
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<td>540-Paver (Opt.)</td>
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<td>592-Dailer</td>
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<td>612-Air Compressor</td>
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MATERIALS

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<tr>
<td>200</td>
<td>Premix</td>
<td></td>
</tr>
<tr>
<td>210</td>
<td>Bituminous Material</td>
<td></td>
</tr>
<tr>
<td>220</td>
<td>Base Aggregate</td>
<td></td>
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<tr>
<td>232</td>
<td>Fine Aggregate</td>
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</tr>
<tr>
<td>244</td>
<td>Filter Fabric</td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>Sand</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Accomplishment</th>
<th>Unit</th>
<th>Daily Production</th>
<th>Productivity Hour/Unit</th>
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</thead>
<tbody>
<tr>
<td>Tons of Premix</td>
<td>9.65</td>
<td>13.2</td>
<td>4.0</td>
</tr>
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</table>

ACTIVITY NO. 201

HIGHWAY OPERATIONS DIVISION - PERFORMANCE STANDARDS

(FORM SM-30) - ACTIVITY 201 - PAGE 2 OF 3
HIGHWAY OPERATIONS DIVISION - PERFORMANCE STANDARDS

(FORM SM-30) - ACTIVITY 201 - PAGE 3 OF 3
**WORK METHODS**

6) Remove and properly dispose of waste material.

**GENERAL NOTES:**
- All maintenance crew leaders and operators are working crew members.
- Hand tools to include rakes, brooms, shovels, lutes, hand tampers, multi purpose saw, etc.
- Number of trucks and operators required will vary depending on haul distance.
- Number of personnel will depend on type of repairs being performed.

**REPORTING NOTES:**

**PLANNING NOTES:**
- 0.5 linear feet of perforated pipe per ton of premix programmed (base repair).
- Two (2) tons of base aggregate per ton of premix programmed (base repair).

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Recommended By: ____________________________ Date ____________

Approved By: ____________________________ Date ____________