PART III - SHOP OPERATIONS

Abstract

A METHODOLOGY FOR MEASURING SHOP PRODUCTIVITY

E. H. Kazlauskas and A. Geist
Pennsylvania Department of Transportation

This report is a review of the Department's (Pennsylvania Department of Transportation) effort to improve the productivity in the County Maintenance Shop facilities. With improving shop productivity as a goal, Clearfield County was selected as a pilot site to test shop improvement recommendations identified by a fleet management consultant along with suggestions already developed by the Department and to serve as a forum for testing alternative shop improvement methods. A database was established by reviewing the 83/84 fiscal year accounting records and identifying key shop activities that accounted for the major man-hours. This served as a basis for studying the 84/85 fiscal year records in order to make a relative comparison of shop time use.

Standards

Time studies were conducted in the shop to analyze existing work methods for key activities from which new shop work standards were developed. The types of work standards typically developed included preventive maintenance and minor repair work for trucks as well as construction equipment. It is important to recognize that the time standards served as the basis for the complete shop work standards developed through a Department Mech-Tech Committee.

The need for facility improvements was identified through numerous brainstorming sessions with the shop mechanics as well as the results of the fleet management consultants recommendations. The total cost for eliminating these deficiencies amounted to approximately $133,000.

Facilities

As an all out effort was made to eliminate these deficiencies, the arrangement of the shop layout was transformed into angle parking in clearly marked shop stalls. Each stall had an electrical outlet and support lighting to improve the work area. To enhance the efficient use of floor space and reduce lost time for the mechanics requisitioning parts out of the parts room, the carpenters room was converted into a parts room next to the stockroom, the tire storage cage was relocated into the stockroom and the floor space was used for additional work bays. Additional improvements were the elimination of the small equipment repair area and the establishment of a training room.

Training/Tools

Two important ingredients that contributed to the improvements within the shop area were the renewed emphasis on training supported by the proper tools. This enabled the mechanics to focus on their work at the bay area in lieu of borrowing tools from one another or losing valuable time seeking answers to questions pertaining to the repair of the new state-of-art equipment being delivered to the County. This also affected the quality of the shop work in a positive way because with the proper tools the mechanics were able to do a better job of repairs.

Return on Investment

As a result of this effort the shop costs for 84/85 fy averaged $47,869 per month compared to the 83/84 fy costs of $56,197 per month which indicated a 14.8% reduction. These savings relate to the key activities and are a part of the overall shop savings.

Return on investment and payback period were the two basic calculations used to evaluate the cost effectiveness of the project.

Formula:

$$ROI = \frac{S - DP}{FC} \times 100\%$$

$$PP = FC / S$$

ROI = Return on investment
S = Annual savings
DP = Depreciation
FC = Initial costs
PP = Payback period

S = annual savings	$ 85,332	/yr.
DP = depreciation/10 yrs	13,296	/yr.
FC = initial cost	132,960	

$$ROI = \frac{85332 - 13296}{132960} \times 100\% = 54\ \%$$ return on investment

PP = 132960 / 72,036 = 1.55 years payback period

Presented as part of a productivity study
conducted by the
Pennsylvania Department of Transportation
Bureau of Operations Review
in conjunction with

Productivity Center
Engineering District 2-0
Clearfield County Maintenance District
Architectural Division
Equipment Division
Training Division