

## Use Benchmarks To Judge

Exclusive *CE* research provides industry yardsticks for maintenance cost numbers

**E**asy profit gains or simple changes for the better are often described as “low-hanging fruit,” implying small effort is needed to grab those improvements.

So what does that say about wasted maintenance dollars, described by one consultant as fruit lying on the ground just waiting to be picked up? “One-third of every maintenance dollar is waste,” says Preston Ingalls, president/CEO of TBR Strategies, a maintenance and reliability consulting firm. “There’s not efficient planning — a high reliance on reactive maintenance. We spend so much money on maintenance and do such a poor job preparing the resources.”

Before equipment managers can harvest that fruit, though, they must identify it. For that, they need benchmarks, a starting point from which they can walk the orchard. *Construction Equipment*, partnering with the Construction Financial Managers Association (CFMA), conducted exclusive research to

establish benchmarks for shop overhead. The accompanying tables list industry benchmarks, by fleet-replacement value, for total maintenance and repair costs, and the underlying costs of labor, facilities and function.

Benchmarking enables the equipment manager to put maintenance and equipment expertise where it’s most required. “You want your mechanics doing the things that will increase uptime of equipment,” says Brian Cooney, CFO for Barriere Construction Co., and chair of CFMA’s highway/heavy committee. For example, he says, mechanics should not be greasing machines in the field; that should be the responsibility of the operator as part of a precheck.

When a firm can measure its performance against industry standards, it can move to change the inefficiencies, such as technicians in the field to grease. Benchmarks enable a manager to give some direction to his decision-making, says Mike Vorster, David H. Burrows Professor of Construction Engineering &

Management at Virginia Tech and author of *Construction Equipment’s* Equipment Executive. “He can compare and calibrate his thinking,” Vorster says. “There are a huge number of judgment calls, and benchmarking helps them calibrate those calls.”

A major call for equipment managers is setting the correct rate for the use of machines. With benchmarks, the manager can accurately recoup the costs associated with equipment

### Maintenance/Repair-Cost Benchmarks (by fleet-replacement value)

	>\$25 million	\$1.1 - \$25 million	<\$1 million
<b>Total dollars, in thousands</b>	\$10,685	\$638	\$35
<b>As % of fleet-replacement value</b>	15.4%	14.7%	11.9%
<b>As % of revenue</b>	11.4%	8.3%	8.5%

Source: *Construction Equipment* 2005 Shop Overhead Survey

**Overall maintenance-and-repair cost should be the starting point for the benchmarking of a fleet’s shop operations. Once total dollars is known, that should be converted into a percentage of fleet value and of revenue. According to Preston Ingalls, a figure higher than 15 percent of fleet value means a company’s maintenance costs are draining profitability.**

# Shop Overhead

## Maintenance-Facilities Benchmarks (by fleet-replacement value)

	>\$25 million	\$1.1 - \$25 million	<\$1 million
<b>No. of permanent shops</b>	3.1	1.3	1.1
<b>Total indoor area at main location, sq.ft.</b>	32,300	15,400	5,900
<b>Total indoor area, all locations, sq.ft.</b>	42,000	20,800	7,100
<b>No. of service bays, total</b>	12.9	5.0	2.2
<b>No. of mechanics trucks</b>	17.9	2.1	0.7
<b>No. of fuel/lube trucks</b>	9.4	1.3	0.4

Source: *Construction Equipment 2005 Shop Overhead Survey*

**One in three fleets with replacement value less than \$1 million do not operate their own maintenance facilities, but those that do differ only in size of shop when compared to the mid-range fleets. The Giant fleets, not surprisingly, have substantial investment in facilities and service fleet.**

# Special Report: Shop Survey

maintenance. Some firms add a burden to their rates to cover shop overhead, Vorster says, and others build overhead into the labor base rate. Either way, capturing that number in the rate ensures accurate cost recovery.

Cooney says the equipment side must work with the finance side in order to make this happen. “The first thing to talk about with the finance [arm of the company] is to go through a detailed budget for the shop, including all direct shop overhead costs,” he says. “The shop manager has to determine what is going to be charged [to him] so he can establish his rates.

“Finance doesn’t understand how the shop runs, and the shop guy probably isn’t familiar with detailed budgets,” he says.

This silo mentality must be broken down, Cooney and Vorster say, and building a common language and communication around benchmark data fosters that. The finance arm must recognize that the equipment operation, including maintenance, is an important part of company profitability.

This communication is “absolutely essential,” Vorster says. “The financial folks get benchmarks from other operations,” he says. “Here, we have data that allow us to compare our operations, too. The financial folks can use these numbers to give them confidence that the equipment guys are doing a good job.”

But the relationship is one of balance, with both financial and equipment managers participating in order to make the decisions that are best for the construction company. According to data from CFMA’s highway/heavy subcommittee, property, plant and equipment represent 70 percent of a company’s assets. “Of the assets of highway/heavy companies, the most significant portion is the iron,” Cooney says.

“The shop and financial people are intimately tied in to determine the company’s needs for equipment,” he says. They must work

## Maintenance Materials, Parts Benchmarks (by fleet-replacement value)

	>\$25 million	\$1.1 - \$25 million	<\$1 million
<b>Total materials cost</b> , in thousands	\$2,455	\$283	\$20
<b>Total parts room cost</b> , in thousands	\$1,091	\$122	\$10
<b>Inventory turn</b> , per year	3.1	4.1	3.1

Source: *Construction Equipment 2005 Shop Overhead Survey*

**For those fleets that operate parts rooms, managers must balance having the right materials and parts available with the investment tied up in the inventory. Slow-moving or extremely expensive parts must be identified so the right decisions can be made about stocking them.**





together to determine the right mix for the dollars invested and to ensure that investment produces the return the company expects on each of its assets.

Of course, benchmarks also benefit the equipment manager who knows how to use them in evaluating operations. Cooney says equipment managers can use benchmarking to understand the business even more, if they're open-minded.

"[Benchmarking] identifies your strengths and weaknesses," he says. "It gives you the goal to shoot for. You can focus on maintaining your strengths and improving your weaknesses."

The numbers *Construction Equipment* uncovered with this research serve as industry benchmarks. We've broken them down by fleet-replacement value in an effort to provide managers with some level of comparison. Obviously, some variation will result due to regional differences in rates, whether a shop is union or not, and the fleet makeup in terms of off-road versus on-road vehicles. But as a starting point, these benchmarks will give fleet managers a plumb line of sorts by which to compare their own fleets.

Ingalls says maintenance costs in this industry range from 15 to 40 percent of fleet-replacement value. *Construction Equipment* data set the average at the low end of this range. Best-in-class companies, says Ingalls, manage a ratio of 8 percent. These types of comparisons

reveal where a maintenance shop can improve.

"Financial numbers only give a sense of the prize," Ingalls says. "Let's say I'm spending 30 percent more than others who are similar. That means I have to figure out ways to close that gap."

The easiest short-term method is to immediately cut costs, but this is short-sighted and will not build long-term efficiencies, Ingalls says. "If I were an equipment manager, I would like to know [these costs] so I can go after the investments to make improvements."

### Maintenance-Labor Benchmarks (by fleet-replacement value)

	>\$25 million	\$1.1 - \$25 million	<\$1 million
<b>No. of shop technicians</b>	18.3	2.9	1.9
<b>No. of field technicians</b>	10.3	1.5	0.8
<b>No. of shop supervisors</b>	3.0	0.9	0.7
<b>No. of shop parts room employees</b>	2.0	0.6	0.4
<b>Total maintenance employees</b>	31.1	5.1	4.6
<b>Shop technician cost/hour</b>	\$39.40	\$31.10	\$22.30
<b>As % of revenue</b>	14.1%	11.0%	5.7%
<b>Field technician cost/hour</b>	\$44.40	\$35.40	\$24.10
<b>As % of revenue</b>	13.4%	8.1%	6.5%

Source: *Construction Equipment* 2005 Shop Overhead Survey

**Actual labor costs vary by geography, obviously, but the important comparison here is that between shop and field. Regardless of fleet size, companies seem to rely on two shop technicians for every field technician. When comparing cost per hour, remember drive time when evaluating field techs.**

## 5 Tenets of Benchmarking

- 1) Never, never use a single metric to draw conclusions. It takes three or four to produce a sound conclusion.
- 2) Look at cost, but also look at equipment reliability, staffing, basic practices in use, and parts management.
- 3) Benchmark across similar and dissimilar industries, but look more closely at those in similar industries. You can learn from both.
- 4) Use benchmarking as a method to highlight opportunities for improvement, not as an end to itself. Be prepared to use the results to create or reshape a strategic plan.
- 5) Use many measures for benchmarking. Use a focused, abbreviated set for performance tracking.

Source: Maintenance Technology Magazine, [www.mt-online.com](http://www.mt-online.com)

One investment might be increased training for technicians instead of slashing technician head counts. If, as in Cooney's example with field operations, shop technicians learn how to solve more equipment problems instead of driving to jobsites with a grease gun, then shop productivity, efficiency and, ultimately, uptime will improve.

"You don't achieve world class by just cost-cutting," Ingalls says. "But we know of hundreds [of firms that] did it through efficiency gains."

The other area affected by a hard look at benchmarks is the equipment rate. Equipment contributes a major portion to a company's job estimate; an inaccurate rate on the high side may cause the company to lose bids. Even worse, an inaccurate rate that's low robs profitability when jobs actually cost more to produce because equipment costs were out of whack.

"If you have a viable [rate], you can pick and choose the profitable jobs," Ingalls says. "We should be working at reducing the rate to stay competitive. This puts the focus on profitability instead of revenue."

Cooney understands this philosophy. Barriere used Ingalls to evaluate their shop facilities. Although it's an extreme case, Barriere closed its shop facilities and now outsources maintenance and repair functions as a result of this type of analysis.

As Barriere began charging jobs for all the non-equipment functions, such as onsite greasing, it started to plan and schedule all of the maintenance work. "We were able to improve productivity of our mechanics by giving them more wrench time," Cooney says. "We lowered our hourly requirements for mechanics because they were now performing real mechanics' work."

Shop overhead, though, could not be lowered enough, and Barriere management elected to close down the function.

Even so, Barriere still maintains benchmarks. "We're still measuring uptime and mean time between breakdowns, for example," Cooney says. "Our shop supervisors are now managing outsourcing instead of managing our shop." 

## Maintenance-Function Benchmarks (by fleet-replacement value)

	>\$25 million	\$1.1 - \$25 million	<\$1 million
<b>Preventive maintenance</b>			
total man-hours spent	5,344	1,717	208
% of total maintenance hours	42.2%	26.2%	23.6%
% of total overtime hours	23.5%	9.0%	8.8%
<b>Scheduled maintenance</b>			
total man-hours spent	6,360	2,143	220
% of total maintenance hours	42.7%	34.9%	25.2%
% of total overtime hours	21.0%	11.8%	8.0%
<b>Emergency/breakdowns</b>			
total man-hours spent	5,555	1,572	140
% of total maintenance hours	31.3%	22.4%	16.5%
% of total overtime hours	36.5%	25.0%	14.4%
<b>% of maintenance that is planned</b>	69.8%	66.2%	61.4%
<b>% of maintenance charged to work orders</b>	67.3%	35.9%	17.7%

Source: Construction Equipment 2005 Shop Overhead Survey

**Raw numbers are not as important as the ratios when it comes to evaluating maintenance performance. Shop philosophy, such as repair before failure, can be justified or defended by looking at how much emergency/breakdown work costs the company, especially in terms of overtime hours.**