

Every Minute Counts

Life Cycle Costing saves county \$5 per hour of motor grader operation



Greenlee County is 1,847 square miles. And Ron Pearson, public works manager, knows the county about as well as anyone.

Pearson, who is in charge of maintaining the county roadway system as well as the equipment fleet, started his career with Greenlee County 18 years ago as a motor grader operator.

The knowledge he gained rebuilding washed out roads, cutting out washboards, and other maintenance chores as a motor grader operator is invaluable in a county with terrain as varied as desert sands and forest roads.

County crews maintain 300 miles of unpaved roads and another 100 miles of paved roadway in the foothills of Arizona's White Mountains. "We maintain everything from desert roads to forest service roads," said Pearson. "I've been on all of the county roads many times."

Unpaved roads are constructed using native materials, which vary from caliche to sand, clay, and gila conglomerate. "It's almost like a cement base, but when you break it up, it lays down really nice," Pearson said of gila conglomerate.

Grader bits serve as sand picks on motor grader moldboards to screen material, and provide a better

gradation on the driving surface. "We can shape, and screen out material. It leaves a nice gravel driving surface," said Pearson.

The Fleet

Maintenance and other roadwork are done using three Cat® 140M Motor Graders, a 140M2 AWD, and a 140H.

"Operators not only have to adapt to all the different materials, they also have to adapt between two styles of graders," said Pearson.

That's where Empire Cat helps. The dealership provides training, including the use of simulators, to help operators meet the challenges of working on a variety of machines and road surfaces.

Empire Cat helped train operators who learned their trade using the steering wheel and shifters of traditional motor graders to make the transition to the joystick-controlled M Series. "They brought a simulator in before we even purchased the equipment," said Pearson. "Trainers were here when the machines arrived."

Pearson's background as a motor grader operator has helped hone his knowledge of machines, and the features necessary to successfully complete county work.

When the county needed a motor grader primarily for snowplowing and other heavy-duty work, he knew the 140M2 AWD was the machine for the job. "The M2 has outstanding power," Pearson said.

The M2 is one of two motor graders that the county uses primarily for special projects such as snow removal and rebuilding washed out roads. "We have a lot of monsoons. We may fix a road, then a monsoon hits, and everything is all blown out again," Pearson said.

The three 140M Motor Graders primarily perform road maintenance.

In years past, the county had kept motor graders as long as 20 years, but Life Cycle Costing that Pearson has been using since 2007 has shown that maintenance costs for older machines are prohibitive.

Today, motor graders are kept on a seven-year replacement cycle.

"We did a cost analysis and found that when you keep machines longer, maintenance costs are a lot higher. Now we do a seven-year rotation, which keeps us within the extended warranty we purchase for the machines," Pearson said.

He has calculated that a motor grader with a 15-year life costs \$47.67 per hour to run, while a machine

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Copper is King

The history of Greenlee County, Arizona, dates to the 1870s when soldiers from Silver City, N.M., noticed rich copper deposits near what are now the cities of Clifton and Morenci. Several of the men returned to prospect, and staked claims when they located large copper tracts.

Copper remains integral to Greenlee County's identity. The Freeport-McMoRan mine in Morenci is the largest copper mining operation in North America, and one of the largest copper mines in the world. With approximately 4,000 employees, the mine is the largest employer in the county, which has a population of approximately 8,500, according to the 2010 census. It is the least populous county in Arizona.





Ron Pearson
Public Works Manager
Greenlee County, Ariz.

Jacks of all Trades

Anyone who wants to work for the Greenlee County Public Works Department better be able to do a lot of different things well.

The department's 31 employees are responsible for a variety of tasks such as setting up for elections, maintaining arenas for rodeo events at the county fair, as well as road maintenance.

"We maintain the fleet, all the roads, the landfill, and a small county airport," said Ron Pearson, public works manager.

Maintenance on paved roads includes chip seal work, which is completed on a five-year schedule. County crews chip seal all 100 miles of paved roadway over the course of three years. In the two off-years, crews concentrate on other types of maintenance work, including a 3/8-inch overlay.

Greenlee County's 30-piece heavy fleet includes a Cat 420E Backhoe Loader, CS54 Soil Compactor, three 140Ms, a 140M2 AWD, and a 140H Motor Grader, 938G, 938H, 924, 908CA and 906CA Wheel Loaders.

"Everybody is cross-trained to operate all machines, except for the motor graders," said Pearson.



with a seven-year life costs \$42.66 per hour. That amounts to an annual savings of \$4,509 per machine and \$22,545 for the fleet.

"That includes everything—replacement cost, parts, labor, and fuel," said Pearson.

Figures are based on actual costs to the county during the five years that Pearson has been using Life Cycle Costing. "We return the savings to the fleet. It's a good investment. We have newer machines, receive a great return, and our maintenance costs are lower," Pearson said.

Full Warranty

By keeping machines for a shorter period, the county is not only saving \$5 per hour of operation, the machines are also under warranty for the entire seven years that they are owned by the county.

Motor graders are acquired through lease-purchase agreements with Empire Cat, which include guaranteed buybacks from the dealer or the option of selling to another party.

"Lately, we've been realizing a greater return on our graders than the guaranteed buyback," said Pearson. "When we resell equipment, it is very well maintained and very well documented."

Empire services Greenlee County's motor grader fleet. Service includes S•O•SSM Fluids Sampling. "We receive full reports on everything. We can head off problems before they occur," said Pearson. "One of the main reasons we go with Cat equipment is the service. That is invaluable to us. If anything happens, they have a facility in the county and are here within an hour."

Greenlee County is a three and one-half to four-hour drive from Phoenix and Tucson, so reliable equipment is essential.

"Because we're so remote, we have to have reliable equipment. Identifying issues before they happen is critical for us," Pearson said. ☺

The More You Know, The Less You Spend

Total cost purchasing enables selection of true low bid

The bottom line, your agency works hard to ensure that tax dollars are used as effectively as possible. Total cost purchasing is a way to achieve this goal.

Consider all owning and operating costs, not simply the initial purchase price. The result is your agency is basing its purchase decision on actual owning and operating expenses for the life of the machine.

Evaluating all owning and operating costs over a machine's working life (purchase price, maintenance and repair costs, and the expected trade-in or resale value of the machine). This provides an accurate measure of the total expense for the life of the equipment, and enables your agency to buy at the true low cost.

Not only does Life Cycle Costing (LCC) enable your agency to make the best use of tax dollars, it also aids in spec writing. With LCC, you're able to tailor your specs to include detailed information on performance, maintenance, anything that helps meet your agency's specific needs.

There's More

Specs can be written to include caps on maintenance and repairs, so there is no scramble to find funding should an unexpected breakdown occur. You can accomplish this when your agency looks beyond purchase price to the total cost of ownership.

Establishing annual service costs and length of ownership for machines also helps in fleet management. Detailed cost information on individual machines enables your agency to make plans to meet expected equipment demands.

With all costs established for the length of machine ownership, there are no budget surprises.

All maintenance and repair costs are set, so annual service expenses are known at the time of purchase. There are no hidden costs.

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Procurement

PROCUREMENT

Life Cycle Costing Point Award Resources

Life Cycle Costing

Life Cycle Costing (LCC) or Life Cycle Analysis (LCA) as it is sometimes referred, adds a new dimension to purchasing capital goods. This concept not only retains, but actually strengthens the competitive bidding low cost philosophy essential to any government agency. With LCC all major costs are established in advance. All of the owning and operating expenses throughout a machine's working life are considered, not just the initial purchase price. When the true costs are analyzed, the results can be surprising.

Taxpayers expect you to get the most value for the money with your equipment purchases. That can't be done without taking into account the total cost of operating the machine over its useful life. Agencies are being asked to do more with less, and the workload doesn't stop just because budgets are tight. No one wants to have unexpected repairs and maintenance costs, or unforeseen downtime eating away at the operating budget. Used correctly, LCC can save guesswork in budgeting and will save worry about the costs of machine repairs, downtime, and lack of availability. It can also protect you against a dealer who won't or can't stand behind the equipment they sell.

Life Cycle Costing is not a new concept for purchasing capital goods. In fact, this concept has been endorsed, and its use encouraged by several governmental associations including the National Institute of Governmental Purchasing (NIGP), National Association of State Procurement Officials (NASPO), American Bar Association (ABA), and NAFA Fleet Management Association. More agencies are using and applying LCC in their bidding process all the time.

In order to apply this methodology to a purchase, you will need to have a sound understanding on how long you plan on owning the machine and the application in which it will be used. In its simplest form, LCC is quite easy. Here are some simple steps describing the basic process.

1. **Begin with the equipment's selling price.**
2. **Next, include a residual/salvage value for the equipment.**
This is usually noted as a buyback or guaranteed buyback number. Be cautious with guaranteed trade-ins since these are only exercised when you purchase your next piece from the vendor offering it.
3. **Add the scheduled maintenance costs over the expected period of ownership.**
This should be a fixed amount and taken directly from the Operating and Maintenance Manual which will outline the individual maintenance intervals and procedures for the established period.
4. **Add the repair costs over the life of the equipment.**
This number will come in the form of the cost quoted for a warranty or extended warranty on the components or systems to be covered over the period of ownership.
5. **Add the fuel costs over the expected period of ownership.**
You will need to know the application the machine will be in and communicate it to the participating vendors. This number can vary dramatically if not clearly understood. Many manufacturers have technology built into the equipment that can measure fuel consumption. Historical records or peer experience can be your best ally. Do not simply accept the numbers published in a vendor's Performance Handbook.

Selling Price - Buyback + Maintenance Cost + Repair Cost + Fuel Cost = Life Cycle Cost

This formula can be customized to include productivity, uptime / downtime and many others. Ultimately, the more elements you include the more confident you can be in your evaluation of the actual cost a particular piece of equipment will have.

Utilizing this process can help you set budgets, predict expenses, establish an equitable process for selecting equipment and, of course, save money. And you have the security of knowing there will be no surprises.

"IT IS UNWISE TO PAY TOO MUCH, BUT IT IS WORSE TO PAY TOO LITTLE. WHEN YOU PAY TOO MUCH, YOU LOSE A LITTLE MONEY --- THAT IS ALL. WHEN YOU PAY TOO LITTLE, YOU SOMETIMES LOSE EVERYTHING, BECAUSE THE THING YOU BOUGHT WAS INCAPABLE OF DOING THE THING IT WAS BOUGHT TO DO!"

NIGP Specification Writing, 2nd Edition

Videos

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with Confidence
Life Cycle Costing - Budget with Confidence

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