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**Financial Aspects of  
Equipment Acquisition**



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TRANSPORTATION RESEARCH BOARD  
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# Financial Aspects of Equipment Acquisition

Developed by TRB Committee on Maintenance Equipment

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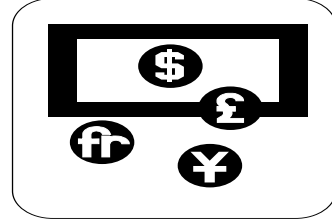
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## Foreword

The material in this Circular is provided to help professional fleet managers analyze various financial acquisition choices and their impacts on budget, total costs, and fleet upgrade factors. The information presented should be applied following a complete analysis to determine the level and duration of equipment needs. The best acquisition choices for a specific fleet and geographic location at any given time may vary from the examples shown in this document—examples in this Circular are presented only for demonstration purposes. Some governmental and commercial fleets are supported by funds generated from a transfer or rental arrangement between field and fleet operations. This steady income stream facilitates the planned replacement of fleet units. However, many fleet operations depend on funds allocated to equipment replacement by elements that are organizationally senior to fleet operations. In this situation, fleet allocations must compete with allocations necessary for operations and other capital asset projects. Often, equipment replacement budgets are subject to feast or famine conditions. Such surges and lags result in replacements that are less than ideal and that bring associated inefficiencies and increased fleet operating costs. Optimizing fleet replacement in a fiscal environment in which different elements are routinely competing for budget share is a challenge routinely addressed by many fleet managers. The following review of fleet procurement alternatives is intended to provide background information for optimizing the positive impact of funds available. This information is particularly applicable when the available capital budget varies due to conditions outside the control of the fleet manager.



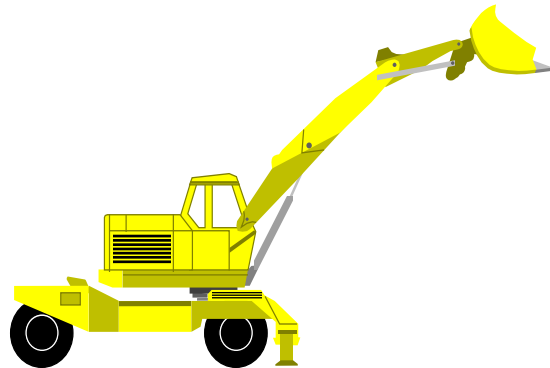
## Financial Aspects of Equipment Acquisition

There are many financial and equipment choices available today for agencies to satisfy the level and duration of equipment needs for key maintenance operations. Before applying the financial acquisition methods discussed in this Circular, it is important to identify the best or appropriate equipment to accomplish the work to be performed, the number of pieces of each required, and the requirement's duration. The results of this equipment needs analysis will significantly influence the choice of the best financial acquisition method for an agency. The financial choices include closed-end leases, open-end leases, municipal leases, residual value guarantees, short-term rentals, total cost bids, life-cycle cost analysis bids, skip payments, balloon payments, low annual percentage rate (APR), fixed payments, variable payments, and a multitude of other combinations. All of these different choices and variables, however, can be grouped into one of the following categories of equipment acquisition methods:

1. Rental,
2. Lease,
3. Cash purchase,
4. Lease purchase,
5. Cash purchase with trade or buyback guarantee, and
6. Any of the five above methods combined with all, some, or one of the following guaranteed costs for
  - Repairs, parts and labor;
  - Manufacturer's recommended maintenance; and
  - Replacement equipment.

These financial choices can be confusing in the aggregate. However, the choices can be simplified by asking the basic question, "Do I want to only pay for the use of the equipment or do I want to pay to own and use the equipment?"

When renting or leasing (via what is often called a true lease or operating lease) a piece of equipment, you are paying for the use of the equipment. A purchase option may be part of the lease or rental contract. However, this purchase option, when combined with the monthly rental or lease payments, will often bring a higher owning cost than other acquisition methods. When cash purchasing, lease purchasing, or cash purchasing with a trade or buyback guarantee, you are paying to own and use the equipment. Paying to own and use the equipment normally requires a higher initial cash flow than the use methods of acquisition such as rentals or operating leases. To simplify the comparative process, operator costs, fuel costs, and costs of misuse or accident have been considered a "wash" between the acquisition choices shown in this document. Be aware, however, that most rental contracts hold the agency liable for "accidents, theft, or misuse," which can



add substantial cost to these acquisition choices if not properly addressed or managed. Other key variables such as duration of need, costs of preventive maintenance and repairs, impact of warranties, lease penalties resulting from excess usage, return from salvage versus trade-in versus buyback, increased operating cost with age, and the administrative and operational disruption costs associated with equipment replacement frequency, should be considered by the fleet owner as they will vary with the alternative chosen. These elements are not included in the comparisons that follow.

## ACQUISITION METHODS

### Rental

Renting equipment is often a great choice for the short-term use of equipment. Rental contracts normally have minimum agency obligations and requirements relative to other acquisition methods. The agency is paying only for the use of the equipment and not for ownership. Renting normally has a relatively low cash-flow requirement for equipment use and can be an excellent way of “trying before buying” a particular model or make of equipment. Rentals are an excellent method for improving short-term equipment utilization ratios and accomplishing short-term job tasks with a minimum equipment fleet investment. Available rental machines may not always be equipped or be the exact model size and capacity to meet agency configuration requirements. Controls and machine functions also may be new to agency operators. In short-term job applications, however, these shortcomings may not be significant. Some rental agreements, called rental purchase contracts, allow the application of some portion of the rent paid for using the equipment to the purchase of the equipment. This can be an attractive option if there might be a long-term need for the equipment after the initial rental period.

### Operating Lease

The operating lease is a good choice for longer-term equipment use that avoids a relatively high investment. The agency usually has a longer-term obligation with an operating lease than with a rental. The monthly lease payment is often lower than the rental due for the committed longer lease term. As with a rental, with the operating lease, the agency is paying for the use, not the ownership of the equipment. Low cash-flow options are available with operating leases that can help justify the development of newer equipment fleets or the replacement of higher quantities of machines. Operating leases also can accommodate special agency requirements, such as skip payment plans, maintenance add-ons, and replacement machine riders. The operating lease also can offer a master lease plan that can greatly reduce traditional acquisition paperwork and procedures. Basically, with the master lease, the agency can add and subtract units as required (within guidelines) without substantially changing its monthly payments or encountering long delays for gaining approvals or processing paperwork.

### Cash Purchase

“Cash on the barrelhead” is the most common method used today by governmental agencies to acquire equipment. Cash purchase is the lowest *cost* method for owning, operating, and disposing of a piece of equipment. When combined with an effective contract for machine repair, parts, and labor required during the life of the equipment, the

cash purchase method is directly comparable to leasing or renting. Properly structured, cash purchase can be a near ideal method for long-term use of equipment by a governmental agency. The biggest barrier to cash purchase for many agencies, however, is its relatively high initial one-payment cash-flow requirement and the associated annual budget authorizations to cover the total cost of new or replacement equipment required by an agency using this approach.



### **Lease Purchase**

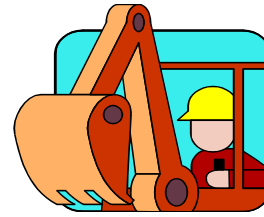
Properly structured, lease purchase (often called municipal lease purchase) contracts offer one of the lowest financing costs for paying to own and use a piece of equipment. By reducing initial cash-flow requirements, lease purchasing is an excellent ownership acquisition tool for matching existing equipment budgets to equipment needs. Normally, the financing documentation and interest costs associated with a lease purchase are lower than the costs incurred by an agency in issuing a bond for raising capital to pay cash for the total equipment acquisitions. The lease purchase contract can be written so there are no early payment penalties, and it can contain suitable nonappropriation of funds clause protection for the governmental agency. The lease purchase contract also may be structured as a capital lease for application of capital budget funds. The financial leverage effect of a lease purchase is impressive and can effectively facilitate quick updating of aged fleets or meeting of unexpected increased fleet quantity needs.

For example, an agency with increasing road usage and its associated deterioration may require additional new and replacement units of maintenance equipment at a faster rate than projected by the original budget set several years earlier. The agency has attempted to increase its equipment replacement budget above the current annual amount of \$1.5 million without success. However, the agency's response to taxpayer complaints about road conditions, traffic flow problems, and road hazards is becoming slower as the equipment fleet ages and traffic volumes increase. The available budget dollars can be used to purchase a combination of approximately 30 maintenance machines and vehicles each year. However, to address the roadway maintenance needs, the agency estimates the need for at least 130 units immediately, rather than in five years as under the current budget plan. A properly structured lease purchase can allow the agency to acquire the immediate use of this higher number of machines without exceeding the annual budget. The advantage of leveraging the available budget dollars to acquire the immediate use of a higher number of machines (and own them at the end of the lease) is one reason lease purchasing is a viable approach for addressing the increased equipment needs.



### Cash Purchase with Trade or Buyback Guarantee

In the long term, the cash purchase of new equipment that includes a trade or buyback guarantee of that equipment will cost more than a straight cash purchase. The main reason for the higher cost is that the agency is asking the bidder to accept some risk regarding the resale value of the machine. Often, the bidder also is asked to guarantee the cost of repairs during the ownership period. To make the risks acceptable, the bidder adds a cost cushion to ensure funds to support the guarantees. The advantage of this acquisition choice is that the cost of ownership is guaranteed and agencies can budget machine costs accurately. Since these guarantees are effective over time, it is to an agency's advantage to deal only with bonded and reputable manufacturers and dealers.



### COST FACTORS

When considering the six basic acquisition methods, it is sometimes helpful to lay out the financial choices and look at their relative, bottom-line effective costs. [Table 1](#) details a sample of retail prices for components on a four-wheel-drive loader that an agency might consider for acquisition. With the basic machine configuration specified, let's see how an equipment dealer or manufacturer might approach the opportunity to price the machine to a governmental agency.

### Pricing Overview

[Table 2](#) presents an example of the considerations that may be reviewed by a dealer or manufacturer when setting a price. The data shown illustrate how an agency might develop a method for evaluating various options for the acquisition of equipment. The best choice available at any given time, on any given bid, in any given area, from any given bidder may vary from time to time and differ from the example.

For example purposes, assume that the supplier's bid price in [Table 2](#) of \$70,655 is acceptable and that the customer now wants to consider acquisition alternatives. Because of maintenance operation need, the customer is considering the acquisition of 25 machines and wants to compare the investment requirements of pay-to-use and pay-to-own options for durations up to 48 months.

**TABLE 1 Example Retail Prices for 2.5-yd<sup>3</sup> Wheel Loader**

| Equipment Component  | Price (\$) |
|--|------------|
| <input type="checkbox"/> Base Machine Price                            | 75,000     |
| <input type="checkbox"/> Front-Axle Hydraulic Lock                     | 850        |
| <input type="checkbox"/> 17.5 x 25 12 PR L2 Tires                      | 500        |
| <input type="checkbox"/> Rollover Protective Cab and Deluxe Cloth Seat | 3,450      |
| <input type="checkbox"/> Bucket with Teeth and Return-to-Dig           | 4,850      |
| <input type="checkbox"/> Counterweight, Drawbar, and Fenders           | 1,950      |
| Manufacturer's Suggested Retail Price (MSRP)                           | 86,600     |

**TABLE 2 Sample Dealer/Manufacturer Pricing Sheet for 2.5-yd<sup>3</sup> Wheel Loader**

| Component   | Price (\$) |
|---|------------|
| <input type="checkbox"/> MSRP (from Table 1)                          | 86,600     |
| <input type="checkbox"/> Factory Freight                              | 1,800      |
| <input type="checkbox"/> Dealer Preparation, Inspection, and Delivery | 400        |
| <input type="checkbox"/> Suggested Window Sticker Price               | 88,800     |
| Supplier's Bid Price  | 70,655     |

### Cash Flow Analysis

**Table 3** compares four acquisition alternatives and identifies the initial cash-flow requirements, the cash-flow requirements at various times during the 48-month period, and the total cash investment over the 48-month term of the contracts. Using this approach, a governmental buyer can see which plan is the best choice in terms of cash flow or total cash investment.

If the agency is interested in owning the equipment, the lowest investment is represented by the straight cash purchase option. If, however, the agency does not have \$1.766 million to purchase the units, it might consider the lease purchase option. This requires \$522,456 in cash the first year. If taken to full term, the lease purchase contract carries \$323,449 in finance charges compared to no finance charges with the straight cash purchase.

Another use of the lease purchase contract is to leverage an existing capital budget to cover additional items, which may not be possible with the straight cash purchase method. For example, if the agency has \$1.766 million in cash to purchase the loaders but decides to use the lease purchase contract, it would have more than \$1.243 million (\$1,766,375 to \$522,456) left after paying for the first year of the lease. These funds could be applied to other purchases, capital, or personnel requirements, and the agency could still have use of the 25 loaders for the first year. The agency could then pay off the amount owed on the lease purchase the next year or continue the contract to its full term.

The rental or operating lease option offers even more leverage of an existing capital budget. The agency could consider renting the loaders instead. Renting may be more cost-effective if the units will only be needed for a short time. In addition, if an

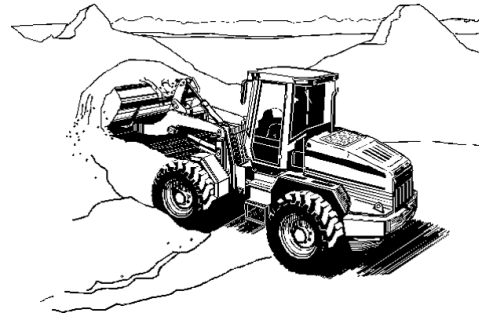
**TABLE 3 Comparison of Cash-Flow Requirements**

| Time in Months        | Pay to Use                                  |                                    | Pay to Own and Use                |                       |
|-----------------------|---|------------------------------------|-----------------------------------|-----------------------|
|                       | Rental <sup>a</sup><br>(\$, 12 months min.) | Operating Lease<br>(\$, 48 months) | Lease Purchase<br>(\$, 48 months) | Cash Purchase<br>(\$) |
| 1                     | 46,750                                      | 28,916                             | 43,538                            | 1,766,375             |
| 6                     | 280,500                                     | 173,496                            | 261,228                           |                       |
| 12                    | 561,000                                     | 346,992                            | 522,456                           |                       |
| 24                    | 1,122,000                                   | 693,984                            | 1,044,912                         |                       |
| 36                    | 1,683,000                                   | 1,040,976                          | 1,567,368                         |                       |
| 48                    | 2,244,000                                   | 1,387,968                          | 2,089,824                         |                       |
| Total Cash Investment | 2,244,000                                   | 1,387,968                          | 2,089,824                         | 1,766,375             |
| Ownership             | Return to Bidder                            | Return to Bidder                   | Agency Owns Equipment             | Agency Owns Equipment |

<sup>a</sup>Rental assumes that a minimum 12-month payment commitment is required to obtain 25 identical units equipped to meet agency requirements.



agency plans on purchasing units and then trading them in after 12 months for newer units (commonly called rolling), renting may be appropriate. However, in the long run, renting is more costly than purchasing. For example, after four years of renting the loaders, the agency would have paid \$477,625 more than it would have paid for a cash purchase and would own nothing. The administrative costs, disruption costs, and possible nonconformity to agency equipment configuration requirements associated with frequent rolling should be considered before choosing this alternative.



More cash flow could be saved if the agency could commit to a longer-term use of the equipment through an operating lease. The agency would not own the equipment at the end of the operating lease; however, it would have full use of the machines for 48 months. In this case, the agency would reduce cash outlays by the following amounts:

- \$0.378 million (\$1,766,375 to \$1,387,968) in cash flow compared to the cash purchase method, and
- \$0.702 million (\$2,089,824 to \$1,387,968) in cash flow compared to the full-term lease purchase.

Again, the agency would not own any of the equipment at the end of the operating lease.

### LIFE-CYCLE BIDS

Another acquisition approach utilized by some governmental agencies is asking bidders to not only provide a purchase price for a machine but also provide a guarantee for repair costs, parts, and labor, and a guaranteed buyback price for the units purchased. The guaranteed buyback price is usually specified for a certain number of years and usage hours. This type of bid is often called a total cost bid or a life-cycle cost bid. Table 4 shows two sample bidder responses to a request for a Total Cost Bid. Bidder A has chosen not to bid the guaranteed repurchase price, and Bidder B has submitted a guaranteed repurchase price. The Guaranteed Parts and Labor Cost row in Table 4 represents the maximum cost that will be incurred by the agency during the term of the agreement for parts and labor. Bidder A claims a savings of \$200,000 on the basis of the difference in the purchase price for 25 units, and Bidder B claims a savings of \$1,085,325 on the basis of the difference in the total cost bid. Which one is the better financial choice, if both bidders meet specifications and offer machines that have acceptable performance, job fit, reliability, warranty coverage, and service support?

With only the information provided in Table 4, it is difficult to know which bid is the better financial choice for the agency. It might be concluded that since Bidder B had the confidence to guarantee a repurchase price for the machine, Bidder B might be the better choice for the agency.

Determining which bid is the best financial choice, however, requires additional analysis. It should be considered for example, that the total cost bids shown in Table 4 are somewhat misleading because they do not include all the machine or acquisition costs.

Important items such as fuel consumption rates, ground-engaging tool wear, routine maintenance expense, equipment wholesale value, and the time value of money are frequently overlooked or deliberately avoided in some total cost bids. To avoid the potential pitfalls of the total cost bid method, it is helpful to use conventional purchasing techniques to determine total investment costs. One technique for helping to determine which bid represents the best financial choice is to compare the bids with due consideration given to the time value of money invested and wholesale equipment value.

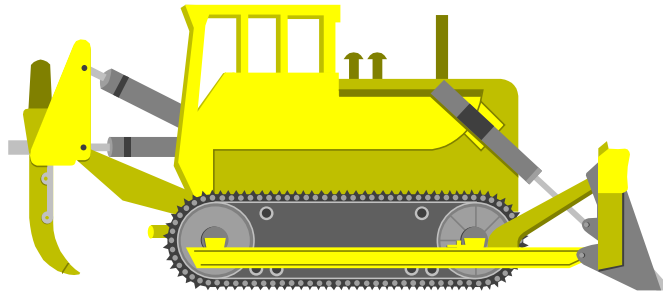


Table 5 provides an example comparison that normalizes an agency’s costs associated with the equipment during the 48-month life of the agreement. To account for the time value of money, the rate of return is calculated on the funds that the agency spent by taking the higher unit purchase price bid. In this example, the interest rate was approximately 3.5% per year (assuming that repair expenses were evenly distributed throughout the 48 months). That is, if the agency could earn 3.5% per year on funds not invested, the agency would be indifferent as to which bid to accept. If the agency can earn between 0% and 3.5% per year, the agency should accept the bid from Bidder B. If the agency can earn more than 3.5% per year, the agency should accept the bid from Bidder A. The estimated wholesale value of the machine for Bidder A was calculated

**TABLE 4 Example of Total Cost Bid Response**

|  | Bidder A (\$) | Bidder B (\$) |
|--|---------------|---------------|
| Purchase Price                           | 70,655        | 78,655        |
| Guaranteed Parts and Labor Cost          | 4,500         | 2,000         |
| Guaranteed Repurchase Price <sup>a</sup> | No Bid        | 48,913        |
| Total Cost Bid                           | 75,155        | 31,742        |
| <b>Bidder A Claims</b>                   |               |               |
| Purchase Price Savings <sup>b</sup>      | 8,000         |               |
| Savings on 25 Units                      | 200,000       |               |
| <b>Bidder B Claims</b>                   |               |               |
| Total Cost Bid Savings <sup>c</sup>      |               | 43,413        |
| Savings on 25 Units                      |               | 1,085,325     |

<sup>a</sup>At four years or 4,000 hours of use.

<sup>b</sup>\$80,655 to \$78,655.

<sup>c</sup>\$75,155 to \$31,742.

**TABLE 5 Example of Bid Comparison Using Time Value of Money and Wholesale Equipment Value**

|  | Bidder A (\$) | Bidder B (\$) |
|--|---------------|---------------|
| Bid <sup>a</sup>                       |               |               |
| 25-Unit Purchase Price                 | (1,766,375)   | (1,966,375)   |
| Maximum Repair Expenses to Agency      | (112,500)     | (50,000)      |
| Residual Value                         |               |               |
| Estimated Wholesale Value <sup>b</sup> | 1,059,825     | n/a           |
| Guaranteed Repurchase Price            | n/a           | 1,222,825     |

<sup>a</sup>Cash outflows are shown as negative, cash inflows are shown as positive.

<sup>b</sup>60% of purchase price used in the example

by projecting that the machines (as-is, where-is) in 48 months or 4,000 hours would have a wholesale value equal to 60% of the purchase price. Similar results can be obtained by comparing the sum of the present values of the purchase price, the repair costs distributed throughout the 48 months, and the residual value for each bid. The present value is less negative (more favorable) for the bid from Bidder B, in this example, when the interest rate is below 3.5% and less negative (more favorable) for the bid from Bidder A when the interest rate is above 3.5%.

On the basis of this type of analysis, it appears that Bidder A is the better financial choice for the governmental agency if the agency can earn more than 3.5% a year. Making the best acquisition choice will not always be as simple as in the examples detailed here. It is hoped, however, that armed with some of the analyses on financial choices covered in this Circular, a fleet manager can better answer the question, “Do I have a real need to own this machine or do I simply want to have use of this machine?”

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