

# Overhead Is Over Our Head

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In the public works field, our focus is often on just accomplishing work. Cost, of course, is a major issue, along with labor, equipment, material and contracts. However, the largest cost being incurred is often the one most misunderstood -- overhead.

Public works agencies face increased scrutiny today and are equally challenged to closely monitor operational costs and thus must understand some basic accounting practices.

Every agency needs to be critical of how it is accounting for work performed while ensuring it documents for all cost and assures it receives total compensation for reimbursable services performed. Determining an appropriate overhead rate can guarantee adequate compensation for those services.

This discussion provides a brief description of the different types of overhead and a specific methodology for calculating an avoidable overhead rate that can be for both maintenance and operations.

## **Capsule overview**

Overhead includes the indirect costs of operating a business and processes that are not directly related to the delivery of a product or service. Direct costs are those associated with the specific product or service provided. The overhead cost, or indirect costs combined with direct costs account for the total cost of doing business. In terms of maintenance within Public Works, the direct costs would include wages for workers who perform the maintenance, equipment usage rates, and any expendable supplies including asphalt, paint, sign posts, etc. These are generally easy to identify and can be attributed directly to a specific maintenance task. The various indirect or overhead costs may include wages for management and administrative staff, insurance, taxes, uniforms, employee training, rent, leave and holiday pay, cell phones, etc. These costs are often distributed across various functions and are not directly charged to maintenance work.

## **Why worry about overhead?**

The purpose of calculating overhead is to assist in identifying those commonly overlooked expenses that are part of the true cost of operations. Without this total cost accounting, not only is it difficult to determine the actual cost for select activities or services, but it's also challenging to recover those costs. When an agency is seeking reimbursement for maintenance services, an appropriate overhead rate added to the labor can ensure full recovery of funds for the expended effort. For example, in an agency with 50 maintenance workers averaging \$15 per hour, an overhead rate off by just 10% can result in a \$132,000 annual shortfall. Overhead rates

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commonly exceed 200%. Incorrectly calculated or applied, millions of dollars in losses can occur for even an average-sized agency. Recognizing the magnitude of this inefficiency and understanding the potential for significant improvement, public works managers should carefully examine their department accounting practices and determine an appropriate overhead rate.

## Types of overhead

Overhead can be calculated various ways, depending on the purpose of the rate being calculated. Two of the most common types of overhead are ‘avoidable’ and ‘full’. Avoidable overhead is a direct cost which could be eliminated, or avoided, if the work was not done by “in-house” resources. These are costs that are related to work efforts. Examples include employee benefits, training, and uniforms. Full overhead includes the avoidable overhead costs in addition to full administration costs and a portion of salaries from support functions such as human resources, IT, etc. Figure 1 shows examples of costs associated with each type of overhead. This article will focus on the calculation of avoidable overhead.

**Figure 1**  
Types of Overhead

### Avoidable Overhead Examples

Employee Benefits  
Training  
Uniforms

### Full Overhead Examples

Employee Benefits  
Training  
Uniforms  
Full Administration  
HR-Support  
IT-Support

## Why Two Overhead Rates?

These two rates offer two distinct values with different applications. The avoidable overhead is applied to determine the *actual cost* of performing the work and provides *cost comparison* to other agencies or contractors. The full overhead is applied to *recover* the full and complete costs for performing work for others. If the full overhead is incorrectly selected to help determine the total cost for outsourcing, and is used in that decision process, it is possible that result could be incorrect. It might appear that an outsourced effort was cheaper than internal support yet the agency budget must increase to cover the cost for using the outsourced service. This is because

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much of the full overhead is not related to a specific activity in the short term, thus the rate would be inflated making it appear that the cost was cheaper when it was not.

For example, let's assume a job to repair one sign took one hour at \$10 per hour for labor and \$5 per hour for equipment. Let's also assume an avoidable rate of 150% and full overhead of 200%. If a contractor bid \$33 per sign, and the agency used the full overhead rate, the agency would determine the cost of \$ 35 per sign ( $\$10 + \$5 + (\$10 \times 200\%)$ ). Then, if the agency chose to use the contractor, they would assume they saved \$2 per sign ( $\$35 - \$33$ ). But the agency has really lost \$3 per sign when computing with avoidable overhead at a cost of \$30 ( $\$10 + \$5 + (\$10 \times 150\%)$ ). Some portion of the full overhead rate cost is fixed and remains, thus, the contract decision process may misguide you in determining outsourcing decisions by overestimating internal cost.

## **Determining overhead rates**

To determine an avoidable overhead rate, some key information must be compiled. Figure 2 outlines what is needed to calculate the rate. First, budgeted wages must be gathered for all positions funded by maintenance and operations. This includes directors, managers, and administrative staff in addition to the various field staff (laborers, equipment operators, etc.). Benefit costs must also be compiled for each employee. This would include retirement, workers comp, insurance, etc.

Next, a complete list of budgeted services and supplies should be compiled that includes the entire maintenance budget, even for items not used directly on maintenance activities. This could include office supplies, rents, contracts, taxes, utilities, etc. Two other required inputs include total available hours per year per employee (generally 2,080 hours), and the average amount of annual leave time budgeted to an employee. The amount of leave time is the sum of annual hours for various leave allowed to the average employee and can include holiday, sick, vacation, etc.

**Figure 2**  
Key Information

Key information required to calculate an avoidable overhead includes:

- Total available hours per year - generally 2,080
- Leave hours per year – normally between 250-350
- Budgeted wages (full & avoidable)
- Employee benefits budget (full & avoidable)
- Supplies and services budget (full & avoidable)

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## Productivity Ratio

The first step is to determine the amount of productive time versus non-productive time. This is the percentage of labor hours each year that is not spent on various leave. This number may vary depending on the amount of leave given to employees and the number of holidays observed by the agency.

To calculate the amount of productive hours, use a standard annual availability of 2,080 hours (52 weeks per year \* 40 hours per week = 2,080 annual hours). Next, determine total non-productive hours by calculating the number of holiday hours and leave hours. Productive time will be calculated by subtracting the number of non-productive hours from the total available annual hours. Divide the number of non-productive hours by the total hours to establish the percentage of non-productive time. The percentage of productive time is simply the percentage of remaining time after non-productive time has been removed -- see Figure 3 on how this is calculated.

**Figure 3**  
Productivity Ratio

For example:

52 weeks \* 40 hours = 2,080 available annual hours,

11 holidays \* 8 hours = 88 holiday hours

28 leave days \* 8-hour workday = 224 leave hours

88 holiday + 224 leave hours = 312 total non-productive hours

2,080 available – 312 non-productive = 1,768 productive hours

312 non-productive / 2,080 productive hours = 15% **Non-Productive Time**

1 – 15% non-productive time = 85% **Productive Time**

## Wages and Benefits

The next step is to determine the amount of employee wages and benefits that would be eliminated if work was no longer performed in-house. **Avoidable Wages** are all wages associated with field positions and the portion of administrative wages that counts towards maintenance work. Determine the benefit costs associated with these positions to establish an **Avoidable Benefit** value.

## Services and Supplies

Determining the amount of avoidable supplies and services will require “educated guesswork” in some cases. These costs include the materials and equipment used during maintenance work. The percentage of avoidable costs must be estimated for each line item by determining the

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percentage that would be avoided if *maintenance work* was no longer performed. For example, if travel costs are for both administrative duties and maintenance duties, only the portion of costs associated with maintenance duties would be considered avoidable. Another example may be telephone costs that partially cover cellular phones used in the field. Only a portion of this expense would be avoidable. This is the part of the process that requires specific knowledge of the budget item definitions and a close understanding of how the department operates. This portion of the overhead calculation will require a significant amount of work but once completed, will determine **Other Avoidable Costs**.

## Support Effort

The amount of supervisor wages and benefits must be calculated similarly to regular wages. These values can be selected from an itemized budget or estimated based on the amount of supervisory staff. You must also determine wages and benefits for support positions. This could include supervisors, managers, and/or office support. This value reflects the amount of time each position spends directly *supporting* maintenance effort. This will determine **Support Wages** and **Support Benefits**.

**Overhead Calculation** All elements can be compiled to calculate the avoidable overhead percentage as shown in Figure 4.

**Figure 4**  
Overhead Calculation

Avoidable Wages	\$ 2,169,236	Using the Avoidable Wage value, multiply the Productive Time Percentage to get the productive wages and the Non-Productive Time Percentage to get the non-productive wages.
Productive	\$ 1,786,430	
Nonproductive	\$ 382,806	
Avoidable Benefits	\$ 1,288,039	Enter the Avoidable Benefit value.
Avoidable Other	\$ 465,104	Enter the Avoidable Other value.
Support Wages	\$ 292,022	Enter the Support Wages and Support Benefits for a Support Total.
Support Benefits	\$ 146,985	
Support Total	\$ 439,006	
Total Cost	\$ 4,361,385	Add all of the dollar values above to determine the total Costs.
OH Multiplier	244.14%	Divide the Total Cost into the Avoidable Wages Subtract 1 or 100% from the OH Multiplier to determine the overhead rate.
OH Rate	144.14%	

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Using this example, applying the Overhead rate of 144.14% to labor, will successfully account for the true cost of doing work. For example, for a job in which a one person crew is driving a pickup and is reading meters, what is the cost? If he makes \$10 hours an hour and vehicle cost is \$7 per hour then the total hourly cost is \$10 for labor + \$7 for equipment + \$ 10 x 144.14 for overhead or \$31.14 with the overhead being the largest cost (46%).

## Summary

In these most difficult economic times where every portion of a dollar counts, having a better understanding of true maintenance costs enables agencies to optimize decisions for cost reduction, offer benchmarking statistics for improvement, and ultimately enhance their operation. The overhead described offers increased ability to calculate true costs. Further, the overhead is often an agency's largest cost and, if not properly estimated, could either overestimate or understate the total cost of the work being performed.

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**LA Consulting**, established in 1993, provides a wide variety of planning, systems and technology services applied to public agencies and municipalities with an emphasis on systems implementation and technical support for public works operations and maintenance. Corporate headquarters is in Manhattan Beach, CA.