CLB 029

Rates

Continuous Learning Module

Defense Acquisition University

Table of Contents

Rates

Module Overview

Welcome to the "Rates" Module

Introduction

Contractor B is bidding on a 5-year contract to support an unmanned aerial vehicle (UAV) for the U.S. Army. Their proposal includes a **wrap rate** of **$150**.

Questions: What is included in the wrap rate? How can you determine if Contractor B's wrap rate is reasonable? Can you use the wrap rate to estimate costs over the next five years if the contract is awarded to Contractor B?

During this continuous learning module, you will learn the answers to these questions and many more related to wrap rates and **other cost estimating rates**.

As a cost analyst, you need to understand how each of these rates is calculated and applied as you evaluate contractors' proposals during source selections and prepare cost estimates.

Target Audience

The module explains essential terms, concepts, and calculations commonly used by contractors and members of the cost estimating acquisition workforce.

Cost analysts, operations research analysts, business financial managers, pricing analysts, source selection board members, and anyone else assessing contractor costs will benefit from completing this module.

Completion Time

This module is approximately two (2) hours in length. You will receive two (2) continuous learning points (CLPs) for successful completion of this module.

Exam

The module culminates in an exam. You must score 100% to pass the exam.

After each exam attempt, you will receive useful feedback including which questions you answered incorrectly and where to find review material.

PDF Version

This PDF version is for those users who:

- Are accessing the module via a screen reader.
- Would appreciate a printer-friendly version of the entire module.

Learning Objectives

Upon completion of this module you will be able to:

- Define key terms related to wrap rate and efficiency rate.
- Estimate contractor hours to complete a task, given the efficiency rate.
- Describe the three rates commonly included in a wrap rate and how each is calculated.
- Calculate the wrap rate given the direct labor, overhead, and other costs.
- Calculate fully burdened labor cost given the wrap rate.
- Identify methods of forecasting future wage rates from a series of past wage rates.
- Use forecasted future wage rates to project fully burdened labor cost and wrap rate.

Module Outline

This module includes the lessons listed below.

Module Overview—The **Module Overview** provides foundational information about the module. It includes the module's target audience, duration, exam parameters, outline, and system requirements, as well as your learning objectives.

Labor Estimation Rates—The **Labor Estimation Rates** lesson begins by defining an integral component of cost analysis and estimation, the **wrap rate**. The rest of the lesson is devoted to explaining an underlying factor of the wrap rate, **direct labor hours**, and another important estimating factor, the **efficiency rate**.

Cost Estimation Rates—The **Cost Estimation Rates** lesson describes the three rates that are typically included in a wrap rate in detail. It includes influential factors you need to consider when making projections over time. It also describes how each of the three wrap rate's rates is calculated and applied.

Wrap Rate Calculations—The **Wrap Rate Calculations** lesson focuses on how to calculate wrap rates given direct labor costs, overhead costs, and other costs; and how to use the wrap rate to estimate fully burdened labor cost.

Wrap Rate Projections—The **Wrap Rate Projections** lesson focuses on how to project future wage, overhead, and other costs rates, and then how to use those projections to estimate the fully burdened labor cost and wrap rate.

Summary

That concludes the Module Overview.

Rates

Labor Estimation Rates

Introduction

Approximate Length: 45 Minutes

Welcome to the **Labor Estimation Rates** lesson of the **Rates** module. This lesson includes the following topics:

- Intro
- Wrap Rate
- Direct Labor Hours
- Efficiency Rate
- Labor Standard
- Summary

Introduction Scenario

Two contractors are bidding on a 5-year contract to produce 1,400 avionics boards for the U.S. Air Force. Contractor A's wrap rate is $80. Contractor B's wrap rate is $85.

Will awarding the contract to Contractor A result in a cost savings for the government? The answer: it depends (at least in part) on the contractors' **efficiency rates**.

The **Labor Estimation Rates** lesson begins by defining **wrap rate** and its components.

The rest of the lesson is devoted to explaining an underlying factor of the wrap rate, **direct labor hours**, and another important estimating factor, the **efficiency rate**.

If you are involved in assessing or estimating contract costs, then you need a solid understanding of wrap rate, direct labor hours, and efficiency rate; and you need to know how to apply the efficiency rate to calculate **realistic** labor hour estimations.

Learning Objectives

Upon completion of this lesson you will be able to:

- Define wrap rate.
- Define direct labor hours.
- Estimate the actual time it will take a contractor to complete a task, given the efficiency rate and standard hours.
- Contrast standard hour and labor standard.

Wrap Rate

As a cost analyst, **wrap rate** is a term you will encounter and use frequently. Another common name for the wrap rate is the **fully burdened labor rate (FBLR).**

The FBLR is called **"fully burdened"** because it attempts to include all the contractor costs necessary to convert the estimated contractor hours to contractor dollars.

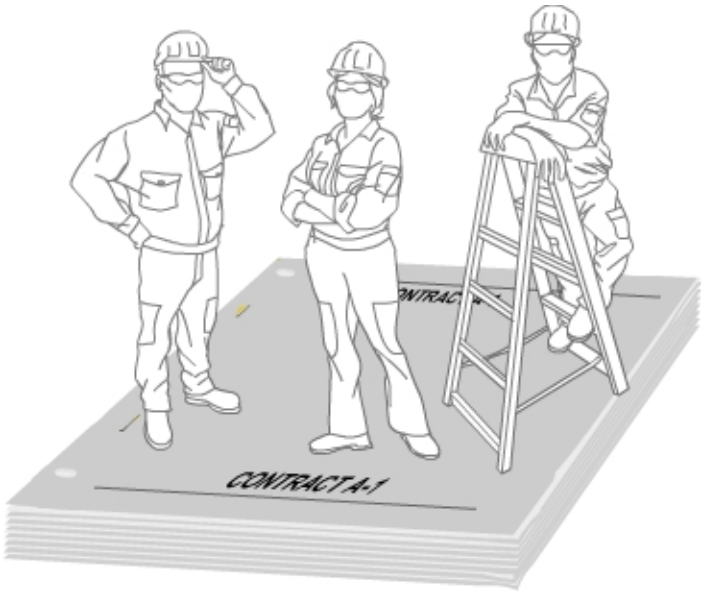
The wrap rate typically includes three rates:

- Direct labor wage rate
- Overhead costs rate
- Other costs rate

Direct Labor

Direct labor hours are hours that can be explicitly attributed to a particular task or work order; or, in government acquisition, to a particular **program** or **contract**.

The **direct labor wage rate** is the composite hourly wage rate of those employees who can be charged **directly** to a specific program or contract.

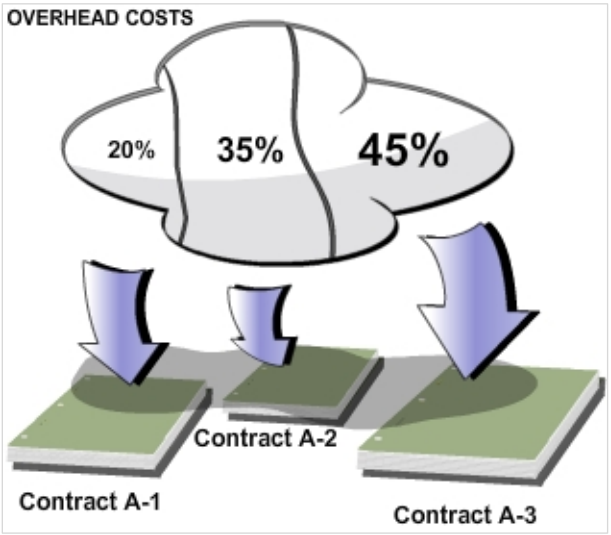


Overhead Cost

Overhead costs, also called **burden**, are **indirect costs** that benefit multiple programs or contracts, and therefore cannot feasibly be charged directly to just one.

Labor costs of personnel who do **not** charge directly to a project or operation—supervisors, inspectors, maintenance workers, custodians, etc.—are usually considered overhead.

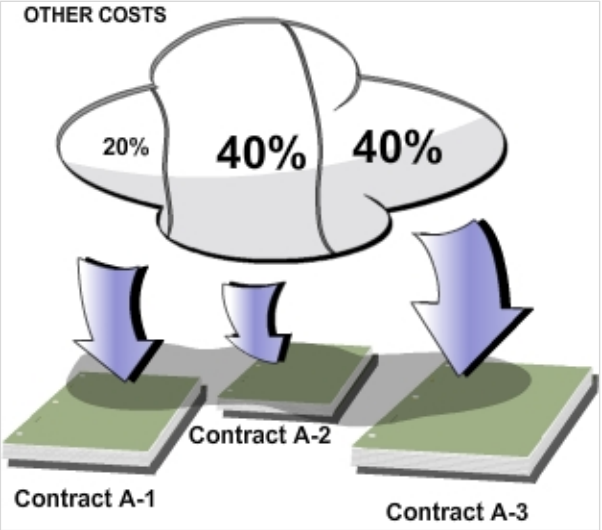
In addition, most firms include fixed charges, such as rent, insurance, and depreciation, in their overhead pool.



Firms account for their overhead costs by allocating them, based on applicable **overhead rates**, to the different programs or contracts the overhead costs benefit.

Other Costs

Other costs are any other costs the firm incurs but has **not** accounted for as either direct or overhead costs.



Depending on the type of contract and degree of risk, other costs sometimes include **profit**.

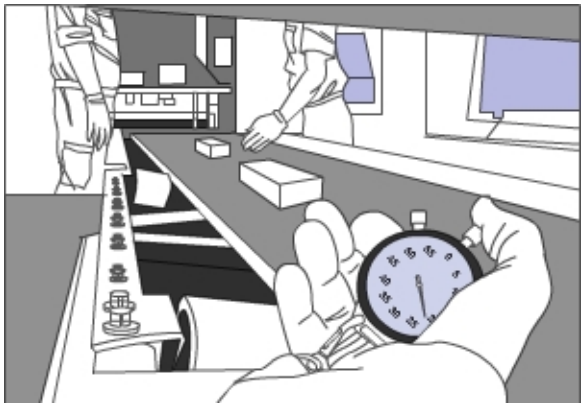
The cost of money and general and administrative costs are also typically included as other costs.

Firms account for their other costs by allocating them, based on applicable **rates**, to the different programs or contracts the other costs benefit.

Sources of Wrap Rates

Sources 1

Where do the labor hours, overhead cost rates, and other cost rates that are included in the wrap rate come from? One way to compile this data is referred to as **detailed**, **grass-roots**, or **bottom-up** estimating.



Detailed, grass-roots, or bottom-up estimating involves starting at the bottom—breaking each program down into its sub-activities and estimating the labor hours, material costs, and overhead associated with each sub-activity.

In order to do a bottom-up estimate, you need access to very **detailed data**. As you can imagine, bottom-up estimating is **extremely time consuming**.

Pure bottom-up, grass-roots estimates are therefore rarely, if ever, compiled by the cost analyst. Actual bottom-up estimates of labor, material, engineering, and quality control are normally prepared by the contractors who will do the work or by the industrial engineering component using existing standards.

Sources 2

Contract pricing and the **Defense Contract Audit Agency (DCAA)** develop and evaluate wrap rates.

The government negotiates **forward pricing rate agreements (FPRAs)** with contractors that represent the best estimate as to what the expected wage rates will be during a specified period. FPRAs are used to set the pay standard for a variety of skill sets found within a geographical region.

Costs analysts rely on the FPRAs when evaluating and comparing contractors' proposals. For example, if the FPRA for a Senior Level IV Computer Programmer in Huntsville, AL is $200, and a contractor has that skill priced at $120 in their proposal, then you need to figure out what the contractor overlooked or which requirements they didn't fully understand.

You will obtain the wage rates, overhead rates, and other cost rates from **contract pricing** and the **DCAA**.

On occasion, you may disagree with or find an error in the provided rates, or you may need to extend the wrap rate beyond the time period of the FPRA contract.

Wrap Rate Application

To illustrate the **fully burdened labor rate (FBLR)**, or **wrap rate**, let's use an example.

Over the next 120 months, Contractor B will spend 160 hours each month supporting a UAV for the U.S. Army at a **direct labor cost** of **$52.50** per hour.

120 months x 160 hours per month x $52.50 = **$1,008,000.**

Question

Is $1,008,000 the **fully burdened** labor cost Contractor B will incur?

Answer 1

No—**$1,008,000** is **not** the fully burdened labor cost Contractor B will incur; this is only the **direct** labor cost.

To calculate the **fully burdened** labor cost, we need to include the **overhead costs** and **other costs** Contractor B will incur.

Contractor B allocates:

- **Overhead costs** at the rate of **150%** of the **wage rate**.
- **Other costs** at the rate of **15%** of the **wage rate and the overhead rate**.

Given this additional information and your undeniable accounting prowess, can you figure out the FBLR?

Recall that the wage rate is **$52.50**.

Answer 2

To calculate Contractor B's wrap rate or FBLR:

Wage rate	$52.50
Overhead rate = $52.50 x 150%	78.75
Other cost = (52.50 + 78.75) x 15%	19.69
FBLR or Wrap Rate	**$150.94**

Now, let's do one last calculation to illustrate fully how the FBLR (wrap rate) is applied.

Recall that Contractor B will spend **160 hours** per month over the next **120 months** supporting the UAV. What is Contractor B's **fully burdened** labor cost?

Answer 3

To calculate Contractor B's fully burdened labor cost:

$150.94 FBLR x 160 hours per month x 120 months = **$2,898,048** fully burdened labor cost.

Challenge—FBLR

State what FBLR stands for and its definition.

Answer

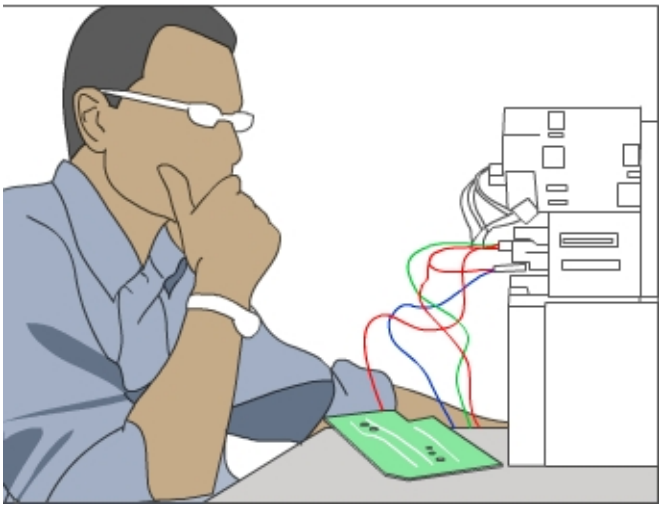
FBLR stands for **Fully Burdened Labor Rate**. The FBLR is also known as the **wrap rate.**

The wrap rate includes the direct labor wage rate, overhead costs rate, and other costs rate.

The wrap rate is used when assessing contractors' proposals and making cost estimations.

Direct Labor Hours

Direct Labor



Now let's turn our attention to an integral part of the wrap rate: **direct labor hours**.

Most of our cost estimating relationships use **direct labor hours** as a parameter or predict cost in terms of direct labor hours. Therefore it is essential that you understand this term.

Direct labor hours are those hours which can be explicitly attributed to a particular task, work order, contract, or program. At the lowest level of direct labor estimation, we would estimate the effort required to produce a given part.

Direct labor costs are typically segregated into two major categories:

- Engineering
- Manufacturing

Engineering

Engineering includes the activities involved in researching and designing products and production processes. Normally the majority of engineering activity is classified as direct labor cost. The following are examples of engineering activities:

Design engineering—Design engineering involves delineating the characteristics and specifications of the end product.

Manufacturing engineering—Manufacturing engineering involves planning the manufacturing process, developing process instructions and work methods, shop loading, organizing work stations, and matching shop capabilities to contractual requirements.

Reliability and maintainability engineering—Reliability and maintainability engineering involves designing and manufacturing products to meet longevity and repair requirements.

Quality assurance engineering—Quality assurance engineering involves the formulation of standards and specifications for tests and inspections.

Sustaining engineering—Sustaining engineering involves as needed support as problems arise throughout the life of the contract.

Manufacturing

Manufacturing labor is the hands-on effort to product a product. The following are examples of manufacturing activities:

Fabrication—Fabrication involves the fashioning of parts from raw materials or purchased materials.

Assembly—Assembly involves the effort to combine parts into subassemblies and assemblies.

Quality control—Quality control involves the act of testing or inspecting the product during the manufacturing process and prior to final acceptance.

Efficiency Rate

Standard Hours

Now that you understand what **direct labor** is, let's examine a useful tool you can use to assess and estimate contractors' direct labor hours—the **efficiency rate**.

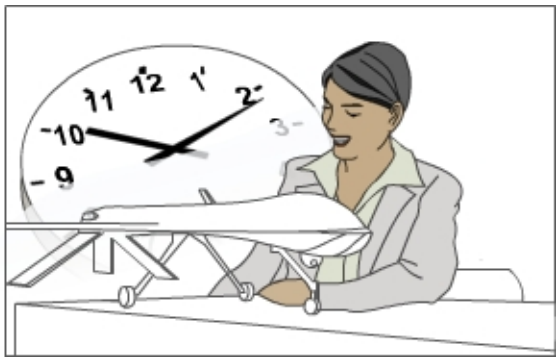
As a cost analyst, you need to know what an **efficiency rate** represents and how to apply it to:

- Assess contractor productivity.
- Develop estimates of labor hours on future projects.

Let's start with a component of the efficiency rate—the standard hour.

A **standard hour** is defined as the number of hours a **skilled** worker will use to complete a given job under **ideal** or **perfect conditions**.

Standard hours are published in government and industry sources relative to the goods and services of interest.



Efficiency Rates

Now that you understand what **direct labor** is, let's examine a useful tool you can use to assess and estimate contractors' direct labor hours—the **efficiency rate**.

Since no worker can achieve the ideal all the time, a factor is applied to the standard hour to account for lost time due to work preparation, cleanup, personal time, operator fatigue, etc. This factor is called the **efficiency rate**.

E**fficiency rate** will vary from one contractor to the next. A contractor's efficiency rate is calculated as:

(Task Standard Hours / Task Actual Hours) * 100 = Efficiency Rate

The efficiency rate may be used to estimate direct labor hours on future projects. Divide the standard hours by the contractor's efficiency rate to estimate the number of hours it is likely to take the contractor to complete the task.

Task Standard Hours / Efficiency Rate = Direct Labor Estimate

Challenge—Efficiency Rate Calculation

Question

The standard hours to change the spark plugs on a tank are **15.75 hours**. On a recent contract, Contractor B averaged 22 hours. What is Contractor B's efficiency rate?

Answer

Contractor B's efficiency rate is **72%.**

Calculated as:

$$\frac{\text{15.75 standard hours}}{\text{22 actual hours}} \times 100 = \textbf{72\%}$$

Challenge—Efficiency Rate Application

Question

Based on past performance, Contractor B's efficiency rate is **72%**. Contractor B bid on a job that is estimated to require **1,500 standard hours**. Use Contractor B's efficiency rate to project the number of direct labor hours they are likely to use.

Answer

Contractor B may require **2,083 hours**.

Calculated as:

$$\frac{\text{1,500 standard hours}}{72\%} = \text{2,083 hours}$$

Labor Standard

Manufacturing involves tasks that are performed repetitively over time. As a result, **labor standards** can be established for these repetitive tasks.

Labor standards facilitate detailed cost evaluation and control, which can result in significant savings to the government.

A labor standard is composed of three elements:

- Leveled time
- Personal, fatigue, and delay (PF&D) allowances
- Special allowances

Leveled Time

Leveled time is one component of a labor standard. Leveled time is the time that a worker of **average** skill, making an **average** effort, under **average** conditions takes to complete a required task. There are a variety of techniques used to determine leveled time. The four most common are listed below.

Time study—During time studies, industrial engineers observe and record the time that a selected worker requires to perform each of the subtasks in the work design. Several observations are required to average out random variations and assure that all elements of the work have been considered.

Predetermined leveled times—Predetermined leveled times are based on basic motion standard data which capture basic body motions, such as reach, move, turn, grasp, position, release, disengage, and apply pressure.

Standard time data—Using standard time data is much like using predetermined leveled times, except that groups of motions (drilling a hole or painting a square foot of surface area) are estimated as a single element instead of individual body motions.

Work sampling—Work sampling is commonly used to develop non-engineering standards. Estimates are based on the proportion of time spent by one or more persons on a given activity.

Allowances

In addition to leveled time, the labor standard needs to include allowances for predictable and unpredictable **work stoppages**. **Personal, fatigue, and delay (PF&D)** allowances are made because no one can work continuously on a task for an entire shift.

Personal allowance—Personal allowance is time for a worker to take care of personal needs.

Fatigue allowance—Fatigue allowance is time to recuperate from work conditions and health concerns.

Delay allowance—Delay allowance is time for unavoidable, predictable, and unpredictable delays.

Along with the PF&D allowances listed above, a **special allowance** is included when formulating a labor standard. The special allowance is for infrequent, unpredictable occurrences such as power failures, machine breakdowns, and minor repairs

Challenge—Direct Labor Terms

Bethany Wong, a new cost analyst, needs your help. She's not sure of the distinction between **direct labor**, a **standard hour**, and a **labor standard**. Please explain, in the box below, how these three concepts are related but distinct.

Answer

Direct labor hours are those hours which can be tied directly to a particular task, work order, program, or contract.

Both **standard hours** and **labor standards** are used to predict the number of direct labor hours it will take to complete a task.

Standard hours are the number of hours it would take a **skilled** worker under **ideal** conditions to perform the task, while **labor standards** are more realistic measures that take into account **average** worker ability and unavoidable work **interruptions**

Summary

Congratulations! You have completed the **Labor Estimation Rates** lesson. Please take a moment to review the key information in this lesson.

Wrap Rate

The **wrap rate**, also called **fully burdened labor rate**, is an integral component of cost analysis and estimation. The wrap rate is called **"fully burdened"** because it includes not only direct labor costs but overhead costs and other costs as well. During the source selection process, costs analysts assess the legitimacy of competing contractors' wrap rates.

Direct Labor Hours

When calculating a contractor's wrap rate, the starting point is typically the direct labor hours. Direct labor hours are those hours which are explicitly attributed to a particular task, work order, contract, or program. Direct labor includes the direct, hands-on efforts to engineer and manufacture the product or system.

Standard Hours

Government and industry sources publish standard hour metrics. A **standard hour** is how long it takes a **skilled** worker under **ideal** or **perfect** conditions to complete a specified task. When trying to estimate how many direct hours a particular contractor is likely to need to complete a specific job, knowledge of the standard hours is a good starting point. To make an accurate estimate, however, you also need that particular contractor's efficiency rate.

Efficiency Rate

The **efficiency rate** is a useful tool to assess contractors' productivity and estimate contractors' direct labor hours. It is based on a contractor's past performance.

Efficiency rate is calculated by dividing the task standard hours by the actual hours the contractor required to complete the task, and then multiplying the quotient by 100. This results in that particular contractor's efficiency rate. Higher efficiency rates (closer to 100%) indicate greater productivity.

The contractor's efficiency rate can also be used to estimate direct labor hours on future projects. If you know that a particular contractor's efficiency rate is **90%** and a job requires **300 standard hours**, then you can divide 300 by .90 to estimate that particular contractor is likely to require **333 hours** to complete the job.

Labor Standard

Labor standards are used to make realistic estimations of how long it should take to complete a job. A labor standard includes leveled time—the amount of time it takes an average worker under average conditions to complete a specified task. After leveled time is established, it needs to be adjusted to allow for personal time, fatigue, and unavoidable delays. The resulting metric is the labor standard.

Rates

Cost Estimation Rates

Introduction

Approximate Length: 45 Minutes

Welcome to the **Cost Estimation Rates** lesson of the **Rates** module. This lesson includes the following topics:

- Intro
- Wrap Rate
- Direct Labor Wage Rate
- Overhead Costs
- Other Costs
- Recovery Rate
- Overhead Allocation
- Summary

Introduction—Scenario

Contractor A's wrap rate is $175 on a 3-year contract to maintain guided missiles for the U.S. Navy. Is this wrap rate reasonable? If the contract is extended another 3 years, should the wrap rate be adjusted?

Cost analysts assess the validity of contractors' **fully burdened labor rates (FBLRs),** also known as **wrap rates**. In addition, you will sometimes have to adjust the wrap rate to predict future costs.

The **Cost Estimation Rates** lesson describes, in detail, the three rates that are typically included in a **wrap rate**. It includes influential factors that you need to consider when making projections over time. It also describes how each of the three wrap rate's rates is calculated and applied.

Learning Objectives

Upon completion of this lesson you will be able to:

- Identify the three components commonly included in a wrap rate.
- Recognize factors that influence wage rates.
- Describe the overhead costs component of a wrap rate, including common examples and how it is calculated.
- Describe the other costs component of a wrap rate, including common examples and how it is calculated.

Wrap Rate

The **wrap rate** is used to allocate overhead and other costs to actual labor costs. Another common name for the wrap rate is the **fully burdened labor rate (FBLR)**.

It is called **"fully burdened"** because it attempts to include all contractor costs necessary to convert the estimated contractor hours to contractor dollars.

There is **no** universal definition of FBLR or wrap rate in the estimating profession because contractors are **not** required to assign costs exactly the same way. Contractors assign costs based on their production processes and the accounting systems which work best for them.

As long as the accounting system is in accordance with Generally Accepted Account Principles (GAAP) and meets with Defense Contract Management Agency (DCMA) approval, it can be used.

Despite these differences, we can confidently state that the **wrap rate** typically includes three rates:

- **Direct labor wage rate**
- **Overhead costs rate**
- **Other costs rate**

Challenge—Wrap Rate Components

List the three components that are commonly included in the **wrap rate**.

Answer

The three components that are typically included in the wrap rate are:

- Direct labor wage rate
- Overhead costs rate
- Other costs rate

Direct Labor Wage Rate

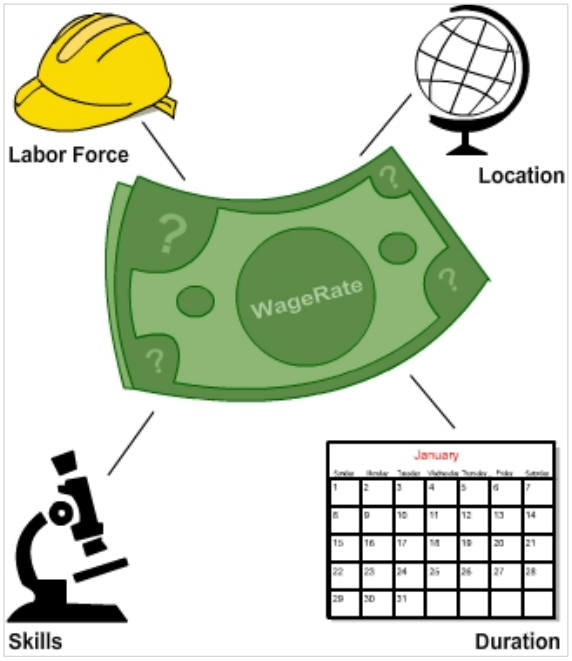
Wage Rate

Direct labor hours are those hours which can be explicitly attributed to a particular task, work order, contract, or program.

The **direct labor wage rate** is the composite hourly wage rate of those employees who can be charged directly to a specific task, work order, program, or contract.

Four general factors have significant impact on the direct labor wage rate—variations in:

- Geographical location
- Skills
- Labor force
- Duration (Time period of the contract)



Location

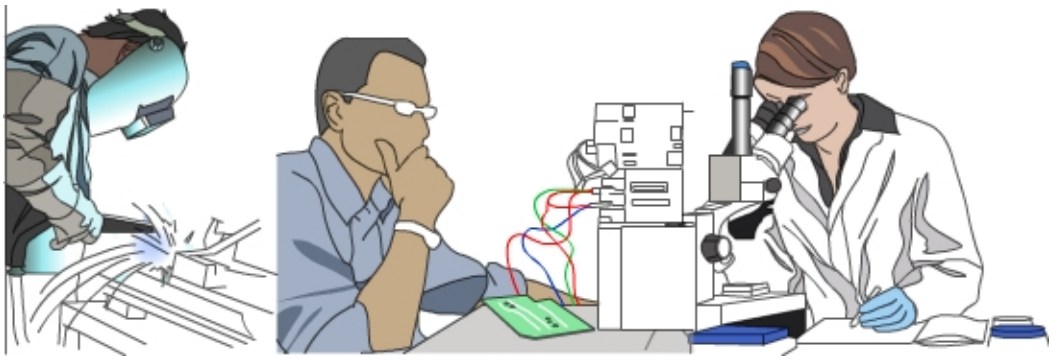
When assessing or estimating direct labor hours, you need to consider variations in **geographical location**.

Direct labor wage rates for the same work vary widely by location due to:

- Supply of and demand for workers in a particular trade
- Strength of the applicable trade organizations
- Cost of living in the area(s)

Skills

Both the nature and degree of the skill(s) required have substantial influence on the direct labor wage rate. Generally, as the required skill level increases, the period of training is longer, and the wage is higher. This consideration applies particularly to trades involving similar work but varying degrees of skill, such as mechanic, fitter, and toolmaker.



Labor Force

Another factor that can have a significant effect on wage rates is either a reduction or an increase in the contractor's **labor force**.

If a firm has a larger labor force than it can profitably employ, it may, during an acute labor shortage, keep the surplus on the payroll in anticipation of future orders.

However, no firm can continue to pay people indefinitely that it cannot profitably employ. If orders do not pick up at some point, the firm has to lay off the surplus to avoid bankruptcy.

When compelled to lay off employees, the firm naturally tries to lay off those of least value. These are normally the employees with the lowest skill levels or those who have been with the firm for the shortest period of time.

These employees usually have the lowest pay rates. Their elimination from the payroll results in an **increase in the average wage rate** of those who remain, even though no one is actually paid a penny more.

If the firm's orders increase and they hire additional workers, the reverse effect is likely to occur—the average wage rate will fall.

Duration

It is a familiar fact that wage rates typically increase over time due to:

- **Increased productivity**, and what the employees regard as their fair share of the resulting increase in profits.
- **Cost of living increases** to counter the effects of inflation on the purchasing power of the employees' income.

Another factor that can have significant impact on direct labor wages is how soon the contractor's **labor contract** with the union comes up for renegotiation.

If the work under the government contract will be completed before the labor contract with the union is renegotiated, the contractor knows what the wage rates will be.

On many government contracts, however, the work is likely to go on for several years. In this case there is a good chance that some or all of the labor union contracts will expire before the contract with the government has been completed.

Challenge—Wage Rate Factors

You're assessing the validity of wage rates cited by a contractor to maintain a data processing center over the next five years. In the box below list at least three factors that may influence the wage rates.

Answer

Some of the factors that may influence wage rates are:

- Supply and demand of workers
- Cost of living in the area
- Required skill levels
- Stability of the contractor's labor force
- How soon the contractor's labor contract with the union comes up for renegotiation

Overhead Costs

Overhead

Recall that the second component of the **wrap rate** is **overhead costs**. Overhead costs are also called **burden.** They are **indirect costs** that cannot be practically attributed directly to a specific cost objective. A **cost objective** is an accounting term for a particular task, work order, product, program, or contract.

Overhead costs are costs that benefit **multiple** cost objectives and cannot feasibly be charged directly to just one. There are two distinct types of overhead costs:

General—The first type of overhead includes costs that are so **general**, they cannot be assigned directly to a specific cost objective. Examples include plant maintenance and rent.

Inconsequential—The second type of overhead includes items that are so **inconsequential** that the cost of accounting for them as direct costs outweighs the benefits. A direct cost of a minor dollar amount may be treated as an indirect cost for reasons of practicality. Examples include common hardware items, such as washers and sandpaper, and minor lubricants, such as grease and oils.

Overhead Pools

Most firms collect indirect costs in aggregate cost accounts called **overhead pools**. Generally, the **overhead pools** fall into one of three broad categories:

- Manufacturing overhead pools
- Engineering overhead pools
- Material overhead pools

Within each of these broad categories, a contractor may have one or more pools, depending on the cost accounting system being used.

Manufacturing

Manufacturing overhead, also known as manufacturing expense or **factory burden**, includes all production costs except direct materials, direct labor, and other costs (explained in the next section).

Manufacturing overhead typically includes:

- **Indirect labor**—supervision, inspection, maintenance, and custodial labor—that is **not** charged directly to a particular cost objective (i.e., a task, work order, product, contract or program).
- **Costs associated with labor**, such as social security and unemployment taxes, vacation pay, shift and overtime premiums, and group insurance.
- **Indirect supplies**, such as washers, sandpaper, and minor lubricants (grease and oils).
- **Fixed charges**, such as depreciation, insurance, rent, and property taxes.

Engineering

Engineering overhead includes the cost of directing and supporting the activities of the engineering department.

Not all companies departmentalize engineering. Some use a single, plant-wide overhead rate that includes both manufacturing and engineering.

In those companies that account for engineering overhead separately, the types of overhead costs are usually similar to the manufacturing overhead costs:

- Indirect labor—both supervisory and support
- Costs associated with labor
- Indirect supplies
- Fixed charges

Material

Material overhead includes costs related to the acquisition, transportation, receiving, inspection, handling, and storage of materials.

In many firms, the indirect costs related to material are **not** segregated from other indirect cost pools.

Challenge—Overhead Costs

Describe overhead costs and list at least four common examples.

Answer

Overhead costs are **indirect costs** that benefit multiple programs or contracts. Common examples include:

- Indirect labor—supervision, inspection, and maintenance—that is **not** charged directly to a program or contract
- Indirect supplies
- Fixed charges
- Indirect costs related to the acquisition, transportation, inspection, handling, and storage of materials

Other Costs

So far we've examined the **direct labor wage rate** and **overhead costs**. The final consideration when building an FBLR or wrap rate is **other costs**.

The definition of **other costs** varies from one firm to another. It depends on what has **not** been captured in the direct and overhead cost categories.

Other costs may include:

- General and administrative (G&A) expenses
- Service centers
- Profit
- Cost of money

In some firms**, G&A** and **service center** pools are included as **overhead** costs rather than **other** costs. Regardless of what the cost is called, the important thing is that it is factored into the FBLR.

G&A

General and administrative (G&A) expenses include:

- Expenses of a company's general and executive offices
- Cost of staff services such as:
  - Legal
  - Accounting
  - Public Relations
  - Financial
- Other miscellaneous activities related to the overall business

Service Centers

A firm may use **service center** cost pools to account for such services as:

- Scientific computer operations
- Reproduction services (copying, not fertility)
- Technical typing services
- Facility services
- Company aircraft services
- Business data processing
- Photographic services
- Art services
- Communication services
- Auto pool services
- Wind tunnels

Profit

Some acquisition contracts allow the contractor to include an agreed-upon amount of **profit** in addition to their costs.

This is usually in return for taking on a difficult, high risk project that requires a long-term commitment of time and capital.

Cost of Money

Other costs may include the **cost of money**. The cost of money is the cost of capital committed to facilities as an element of contract cost.

In other words, the Department of Defense (DoD) pays additional money for the contractor to maintain the production facilities, operating lines, etc., for the duration of the contract.

Challenge—Other Costs

Describe **other costs** and cite **four** examples.

Answer

Other costs include costs that are not already captured as either direct costs or overhead. The exact content of **other costs** varies from firm to firm. Examples may include:

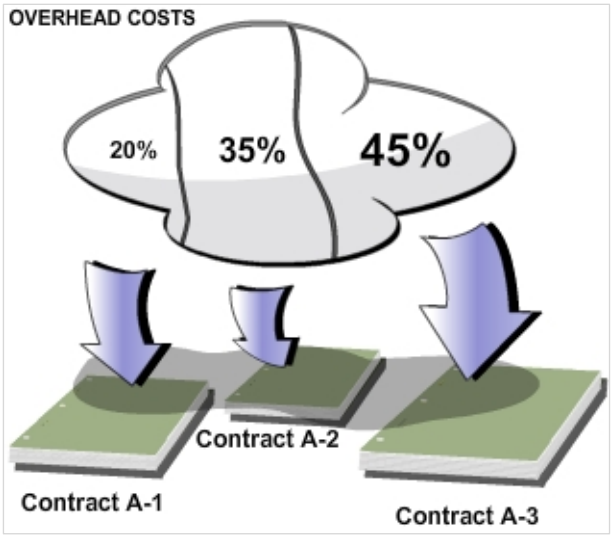
- Expenses of the company's G&A offices
- Service center costs
- Profit, depending on the contractual agreement with the government
- Cost of money

Recovery Rate

Now that you have a solid understanding of **overhead** and **other costs**, we can focus on how these costs are divided among the firm's various cost objectives.

In order to **recover** indirect costs, it is necessary to allocate them to each cost objective they benefit.

Recall that a **cost objective** is an accounting term for a task, work order, product, program, or contract. In government acquisition, the cost objective is normally the program or contract.



We want to ensure that each program or contract is charged its fair share of the indirect costs. We do this by calculating a **recovery rate** for each indirect cost pool.

Formula

The **recovery rate** for each cost pool is established by:

1. Selecting an appropriate base on which to prorate the total cost pool dollars

2. Calculating the ratio of the cost pool dollars to the base

$$\frac{\textbf{Total cost pool dollars}}{\textbf{Base}} = \textbf{Recovery Rate}$$

The following example illustrates how one firm allocates **engineering overhead costs**. In this case, they use **engineering direct labor dollars** as the base.

$$\frac{\text{Engineering overhead dollars}}{\text{Engineering direct labor dollars}} = \frac{\$5{,}000{,}000}{\$1{,}000.000} = \textbf{\$5.00} \text{ per engineering direct labor dollar}$$

Question

Based on the firm's engineering overhead cost rate of **$5** per engineering direct labor dollar, if **Contract A** had **$30,000 direct labor cost**, what is Contract A's share of the engineering overhead costs?

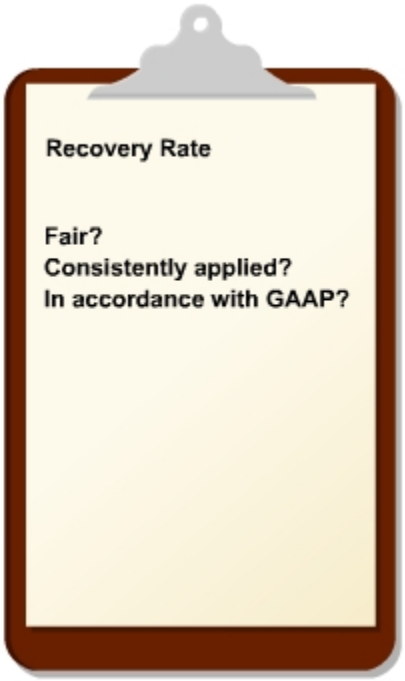
Answer

$30,000 engineering direct labor x $5 = **$150,000** engineering overhead costs

Contract A's share of the $5,000,000 engineering overhead costs is **$150,000**.

Criteria

The **bases** used for allocating indirect costs differ between firms, depending on each firm's accounting system and operations.



The base used for allocating indirect costs should:

- Produce a rate that will result in an **equitable** allocation of the indirect costs among the various cost objectives.
- Be applied **consistently** from year to year and from cost objective to cost objective.
- Adhere to generally accepted accounting standards.

Bases

In calculating the **recovery rate**, the numerator in the equation is always the indirect cost pool dollars, and the denominator is always the applicable base.

$$\frac{\textbf{Total cost pool dollars}}{\textbf{Base}} = \textbf{Recovery rate}$$

The Cost Accounting Standards Board cites several **bases** which may be used. The objective is for each firm to select those bases which result in equitable distribution of each of their cost pools. Therefore different firms use different bases. And, within the same firm, they often use different bases for different cost pools.

For example, Firm A allocates **manufacturing overhead** dollars using this formula:

$$\frac{\text{Manufacturing overhead pool dollars}}{\text{Direct labor hours}} = \text{Dollars per direct labor hour}$$

For the **G&A** cost pool, Firm A uses this formula:

$$\frac{\text{G\&A cost pool dollars}}{\text{Cost of goods manufactured (COGM)}} \times \text{Percentage of G\&A per dollar of manufacturing cost}$$

Overhead Allocation

Challenge—Manufacturing Overhead Allocation

Contractor B uses a recovery rate based on direct labor costs to allocate **manufacturing overhead** costs. Listed below are a few of the amounts from last month:

Total direct labor hours	6,750 hrs.
Total direct labor cost	$400,000
Total manufacturing overhead	$250,000
Total G&A overhead	$ 80,000
Contract B-17 direct labor hours	1,266 hrs.
Contract B-17 direct labor costs	$ 75,000

1. Calculate Contractor B's **manufacturing overhead recovery rate**.

2. Use the recovery rate to allocate a portion of the total **manufacturing overhead** costs to **Contract B-17**.

Answer

Step 1: Calculate the manufacturing overhead recovery rate. Since Contractor B allocates manufacturing overhead costs on the basis of direct labor costs, we calculate their manufacturing overhead recovery rate as:

$\frac{\$250{,}000 \text{ Total manu. overhead}}{\$400{,}000 \text{ Total direct labor cost}} \times 100 = \$62.5\%$ Manu. overhead recovery rate

Step 2: Apply the manufacturing overhead recovery rate to Contract B-17's direct labor cost.

62.5% x $75,000 Contract B-17's direct labor cost = **$46,857** Contract B-17's share of manufacturing overhead

Challenge—G&A Overhead Allocation

Contractor B uses a recovery rate based on direct labor costs to allocate **G&A** costs. Listed below are a few of the amounts from last month:

Total direct labor hours	6,750 hrs.
Total direct labor cost	$400,000
Total manufacturing overhead	$250,000
Total G&A overhead	$ 80,000
Contract B-17 direct labor hours	1,266 hrs.
Contract B-17 direct labor costs	$ 75,000

1. Calculate Contractor B's manufacturing **G&A** recovery rate.

2. Use the recovery rate to allocate a portion of the total **G&A costs** to **Contract B-17**.

Answer

Step 1: Calculate the G&A recovery rate. Since Contractor B allocates G&A on the basis of direct labor hours, we calculate their G&A recovery rate as:

$$\frac{\$80{,}000 \text{ Total G\&A}}{6{,}750 \text{ Direct labor hours}} = \textbf{\$11.85} \text{ G\&A dollars per direct labor hour}$$

Step 2: Apply the G&A recovery rate to Contract B-17's direct labor cost.

$11.85 x 1,266 Contract B-17's direct labor hours = **$15,002** Contract B-17's share of G&A costs

Assessing Overhead Rates

Now that you understand what is included in overhead and other costs and how they are allocated, let's conclude this topic with a warning.

When you see contractors' overhead rates, be careful **not** to make a rash judgment about the magnitude of a particular rate.

You will hear cost analysts say: "That rate is too high." This conclusion can be dangerous.

Remember, the rate merely represents the relationship between one number and another. It has relevance only when considered in context with the other number.

An overhead rate of 90% may be too high; while one of 200% may be too low. The question is **not** if the rate is too high or too low **but if the fully burdened labor cost is reasonable**.

Summary

Congratulations! You have completed the **Cost Estimation Rates** lesson. Please take a moment to review the key information in this lesson.

Wrap Rate

The **wrap rate**, also called **fully burdened labor rate**, begins with the direct labor rate but also includes the **overhead rate** and **other costs rate**. Cost analysts assess the validity of competing contractors' wrap rates during the source selection process.

Direct Labor Hours

The **direct labor wage rate** is the composite hourly wage rate of those employees who can be charged directly to a specific task, work order, program, or contract. When assessing wage rates, cost analysts need to consider several factors:

- Geographic location
- Skill level required
- Size and stability of the workforce
- Duration of the contract

Overhead Costs

Overhead costs are **indirect costs**—costs that cannot be practically charged directly to a specific program or contract. Overhead costs generally fall into one of three overhead pools: **manufacturing** overhead, **engineering** overhead, and **material** overhead.

Manufacturing and engineering overhead include indirect labor, costs associated with labor, indirect supplies, and fixed charges.

Material overhead includes costs associated with the acquisition, transportation, handling, and storage of materials.

Other Costs

Other costs typically include such things as general and administrative (G&A) expenses, centralized service centers, profit (depending on the contractual agreement with the government), and the cost of money (if the contractor has significant capital assets dedicated to a particular government program).

Other costs vary from firm to firm—what one company categorizes as **overhead** may be categorized as **other costs** by another company. As long as it is in accordance with Generally Accepted Accounting Principles (GAAP), companies are free to use the accounting system that is best for their particular circumstances.

G&A expenses are a good example. While many companies categorize G&A as overhead, many others categorize G&A as other costs. Regardless of the category, the important thing is that G&A expenses are included when calculating the wrap rate.

Recovery Rate

In order to **recover** indirect costs, contractors need to allocate **overhead** and **other costs** to each program or contract they benefit. This is done by calculating the **recovery rate**—the total cost pool dollars divided by the relevant base.

Overhead Allocation

After the **recovery rate** is calculated for each indirect cost pool, the contractor applies each recovery rate to allocate a portion of the applicable indirect cost pool to each of the contractor's programs or contracts.

Rates

Wrap Rate Calculations

Introduction

Approximate Length: 15 Minutes

Welcome to the **Wrap Rate Calculations** lesson of the **Rates** module. This lesson includes the following topics:

- Intro
- Wrap Rate Calculation 1
- Wrap Rate Calculation 2
- Summary

Contract pricing and the Defense **Contract Audit Agency (DCAA)** develop and evaluate contractors' **fully burdened labor rates (FBLRs)**, also called wrap **rates**.

The government negotiates **forward pricing rate agreements (FPRAs)** with contractors that represent the best estimate as to what the expected wage rates will be during a specified period. FPRAs are used to set the pay standard for a variety of skill sets found within a geographical region.

Cost analysts rely on the FPRAs when evaluating and comparing contractors' proposals. For example, if the FPRA for a Senior Level IV Computer Programmer in Huntsville, AL is $200, and a contractor has that skill priced at $120 in their proposal, then you need to figure out what the contractor overlooked or which requirements they didn't fully understand.

As a cost analyst, you will obtain the wage rates, overhead rates, and other cost rates from contract pricing and the DCAA. On occasion, you may disagree with or find an error in the provided rates.

Learning Objectives

Upon completion of this lesson you will be able to:

- Calculate the wrap rate given direct labor, overhead, and other costs.
- Use the wrap rate to estimate fully burdened labor cost.

Wrap Rate Calculation 1

Once you have all the pieces, calculating the wrap rate is **not** "brain surgery" but the specific calculations will vary from one contractor to the next depending on the bases each uses for allocating overhead and other costs.

For example, a contractor reported the following for Contract A-22 last month:

- 50,000 hours direct labor (DL)
- $1 million DL costs
- $.5 million manufacturing overhead
- $.2 million other costs

Calculate the FBLR for this contractor for Contract A-22.

Answer 1

There are two ways to calculate the Contract A-22 FBLR. One way to calculate the FBLR:

$1 million DL cost ÷ 50,000 DL hours =	$20	DL rate
$500,000 manufacturing overhead ÷ 50,000 DL hours =	10	manufacturing overhead rate
$200,000 other costs ÷ 50,000 DL hours =	4	other costs rate
	$34	**FBLR or wrap rate**

Another way to calculate the FBLR:

DL cost	$1,000,000		
Manufacturing overhead	500,000		
Other costs	200,000		
Total	$1,700,00	÷ 50,000 DL hours =	**$34 FBLR or wrap rate**

Estimation

Now that we have determined Contract A-22 has an FBLR of $34, let's apply that information to next month.

The contractor expects to expend 70,000 DL hours on Contract A-22 next month. Estimate the fully burdened labor cost for Contract A-22 next month.

Answer

Given Contract A-22 FBLR of **$34** and **70,000** direct labor hours for next month, the fully burdened labor cost is calculated as follows:

$34 FBLR x 70,000 DL hours = **$2,380,000** fully burdened labor cost estimate for next month

Wrap Rate Calculation 2

Now let's calculate the wrap rate for a contractor who allocates overhead and other costs based on cost instead of hours.

Contractor C reported the following last month:

- 2,500 DL hours
- $65 DL rate
- Manufacturing overhead is allocated at the rate of 125% of direct labor costs
- Other costs are allocated at the rate of 20% of direct labor costs and overhead costs

Calculate Contractor C's FBLR.

Answer

2,500 DL hours x $65 DL rate =	$162,500	DL costs
1.25 overhead rate x $162,500 DL costs =	203,125	overhead costs
.20 x (162,500 DL costs + $203,125 overhead costs) =	73,125	other costs
	$438,750	fully burdened labor cost
$438,750 fully burdened labor cost ÷ 2,500 DL hours =	**$175.50**	FBLR or wrap rate

Estimation

Now that we have determined Contractor C has an FBLR of $175.50, let's apply that information to next month.

The contractor expects to expend 2,000 DL hours next month.

Estimate the fully burdened labor cost for Contractor C for next month.

Answer

Given Contractor C's FBLR of **$175.50** and **2,000** direct labor hours for next month, the fully burdened labor cost is calculated as follows:

$175.50 FBLR x 2,000 DL hours = **$351,000** fully burdened labor cost estimate for next month

Summary

Congratulations! You have completed the **Wrap Rate Calculations** lesson. Please take a moment to review the key information in this lesson.

Wrap Rate Calculation

To calculate the wrap rate, you begin by calculating the overhead costs rate in accordance with the contractor's overhead base.

You calculate the **other costs rate** the same way—in accordance with the contractor's other costs base.

Finally to calculate the **wrap rate**, you add the **direct labor wage rate**, **overhead costs rate**.

Fully Burdened Labor Cost Calculation

After you calculate the wrap rate, you can apply the wrap rate to direct labor hour estimates to forecast the contractor's future fully burdened labor costs.

Rates

Wrap Rate Projections

Introduction

Approximate Length: 15 Minutes

Welcome to the **Wrap Rate Projections** lesson of the **Rates** module. This lesson includes the following topics:

- Intro
- Wrap Rate Calculation 1
- Wrap Rate Calculation 2
- Summary

It's common for defense systems to require operations and support (O&S) for five, ten, or more years. The Department of Defense (DoD) often operates systems for several years beyond initial design parameters.

The best example is the **B-52** airframe. First introduced as a long-range strategic bomber in the early 1950s, the B-52 still flies routine operational mission assignments.

As a cost analyst, one of the challenges you'll face is extending contractors' fully burdened labor rates (FBLRs) beyond the time period covered by the negotiated forward pricing rate agreements (FPRAs) for O&S or other services.

Wage rates and other costs vary. They typically increase over time. How can you predict what wage rates and other costs may be three or more years into the future?

Learning Objectives

Upon completion of this lesson you will be able to:

- Identify methods for projecting future wage rates, overhead rates, and other costs rates.
- Calculate the future fully burdened labor cost and wrap rate given future wage rate projections, overhead costs rate, and other costs rate.

Wrap Rate Projection Methods

For the past five years, Contractor A has provided O&S for a war gaming interactive simulation for the U.S. Marine Corps. Contractor A's support encompasses the software and hardware (computers and simulators).

Our challenge is to predict what Contractor A's wage rates will be over the next three years.

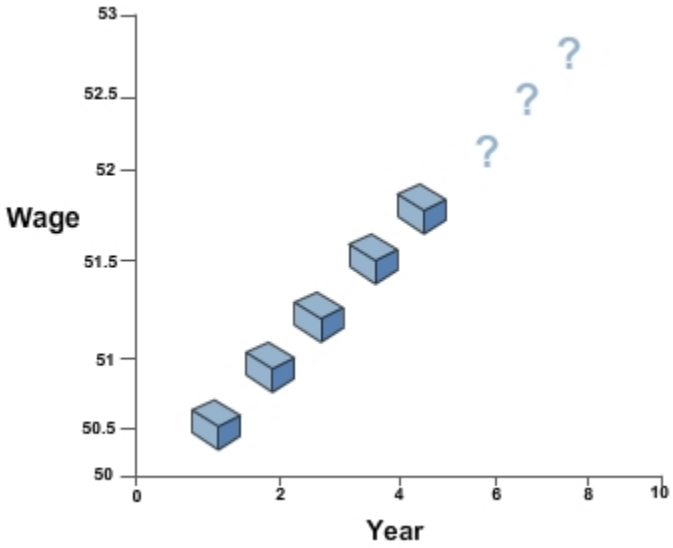
There are statistical techniques for forecasting future wage rates, overhead rates, and other costs rates, such as:

- Regression analysis
- Moving average
  - Simple moving average
  - Weighted moving average
  - Exponential moving average

Regression Analysis

Regression analysis refers to techniques for modeling and analyzing several variables, when the focus is on the relationship between a **dependent** variable and one or more **independent** variables.

For example, when you use regression analysis to forecast wage rates or overhead rates, **time** is the **independent variable**, and the **wage rate** or **overhead rate** is the **dependent** variable.



More specifically, regression analysis helps you understand how the typical value of the dependent variable changes when any one of the independent variables is varied, while the other independent variables are held fixed.

Most commonly, regression analysis estimates the conditional expectation of the dependent variable given the independent variables—that is, the average value of the dependent variable when the independent variables are held fixed.

Moving Average

A moving average is a statistical method used to smooth out short-term fluctuations in time series data and highlight long-term trends or cycles. Three common types of moving averages are listed below.

Simple moving average—When applied to time series data, a **simple moving average** is the average of the last X number of observations. You decide how many of the most recent observations should be included to get the most realistic result.

Weighted moving average—A **weighted moving average** is similar to a simple moving average in that you determine how many of the most recent observations to include. The difference is—a weighting factor is assigned to each observation. Typically, the most recent observation is given the greatest weight, and each preceding observation is given a progressively smaller weight.

Exponential smoothing—Exponential smoothing is a statistical technique that can be applied to time series data, either to produce smoothed data for presentations or to make forecasts. In a simple moving average, the past observations are weighted equally. However, when exponential smoothing is applied, the most recent observation is given the greatest weight and each preceding observation is given an **exponentially** smaller weight.

Wrap Rate Projections Applied

The benefit of using a statistical technique to forecast future wage rates is that the results are defensible, as long as they are derived using valid historical cost data.
The shortcoming of the statistical methods is that they may ignore potentially significant cost factors.

For example, the statistical model built on historical data ignores the contractor's business base, expiration of labor union contracts, and the existence of negotiated labor rates in Forward Pricing Rate Agreements (FPRAs).

You should **not** just arbitrarily apply one of the statistical models to forecast future wage rates. Instead, you should:

- Identify those factors which may influence the contractor's future wage rates and document them in your list of assumptions.
- Use your judgment and adjust the wage rate forecasts in accordance with the factors you identified.

Example

Contractor A has provided O&S for a war gaming interactive simulation for the U.S. Marine Corps for the past five years. Their direct labor wage rates are listed below.

Year	DL Wage Rate
1	$50.58
2	$50.93
3	$51.18
4	$51.48
5	$51.80

Our challenge is to estimate the cost of O&S for the next three years. We apply regression analysis to forecast Contractor A's labor wages in years 6-8.

Results

Based on years 1-5, and our regression analysis, we project the wage rate in years 6-8, as shown below.

Year	DL Wage Rate
1	$50.58
2	$50.93
3	$51.18
4	$51.48
5	$51.80
6	$52.09
7	$52.39
8	$52.69

Challenge—Projecting Future Costs

List at least three statistical methods for projecting future wage rates, overhead costs, and other costs.

Answer

Statistical methods for projecting future wage rates, overhead costs, and other costs include:

- Regression analysis
- Moving average
  - Simple moving average
  - Weighted moving average
  - Exponential moving average

Wrap Rate Calculation

Now let's calculate the fully burdened labor cost and wrap rate for Contractor A in year 8.

- $52.69 projected DL wage rate in year 8.
- 160 DL hours each month.
- 10 months of O&S provided each year.
- Overhead is allocated at the rate of 150% of direct labor costs.
- Other costs are allocated at the rate of 15% of direct labor costs and overhead costs.

Answer

160 DL hours x 10 months x $52.69 DL rate =	$ 84,304	DL costs
1.5 overhead rate x $84,304 DL costs =	126,456	overhead costs
.15 x ($84,304 DL costs + $126,456 overhead costs) =	31,614	other costs
	$242,374	**fully burdened labor cost**

$242,374 fully burdened labor cost ÷ (160 x 10 DL hours) = **$151.48 FBLR or wrap rate**

Summary

Congratulations! You have completed the **Wrap Rate Projections** lesson. Please take a moment to review the key information in this lesson.

Wrap Rate Projection Methods

As a cost analyst, you will sometimes have to extend contractors' fully burdened labor rates beyond the time period covered by the negotiated forward pricing rate agreement. To do this, you may rely on statistical methods to forecast future labor rates.

Regression analysis is a statistical technique that illuminates how the value of a dependent variable, such as direct labor wage rates, changes in response to changes in one or more independent variables, such as time.

Simple moving average, **weighted moving average**, and **exponential moving average** are statistical methods used to smooth out short-term fluctuations in long-term data series.

Regardless of the statistical method you use, it is wise to consider other factors which may influence the contractor's future wage rates and adjust the statistically-generated wage rate forecasts accordingly.

Wrap Rate Projections Applied

After you rely on statistics and your judgment to forecast future wage rates, the future wage rates, coupled with forecasted overhead and other costs can be used to project the contractor's future fully burdened labor cost and wrap rate.

Module Summary

Congratulations! You have completed the **Module Summary** lesson. Please take a moment to review the key information in this lesson.

Wrap Rate

The **wrap rate**, also called **fully burdened labor rate**, is an integral component of cost analysis and estimation. The wrap rate is called **"fully burdened"** because it includes not only direct labor costs but overhead costs and other costs as well. During the source selection process, costs analysts assess the legitimacy of competing contractors' wrap rates.

Direct Labor Hours

When calculating a contractor's wrap rate, the starting point is typically the direct labor hours. **Direct labor hours** are those hours which are explicitly attributed to a particular task, work order, contract, or program. Direct labor includes the direct, hands-on efforts to engineer and manufacture the product or system.

Standard Hour

Government and industry sources publish standard hour metrics. A **standard hour** is how long it takes a **skilled** worker under **ideal** or **perfect** conditions to complete a specified task. When trying to estimate how many direct hours a particular contractor is likely to need to complete a specific job, knowledge of the standard hours is a good starting point. To make an accurate estimate, however, you also need that particular contractor's efficiency rate.

Efficiency Rate

The **efficiency rate** is a useful tool to assess contractors' productivity and estimate contractors' direct labor hours. It is based on a contractor's past performance.

Efficiency rate is calculated by dividing the task standard hours by the actual hours the contractor required to complete the task, and then multiplying the quotient by 100. This results in that particular contractor's efficiency rate. Higher efficiency rates (closer to 100%) indicate greater productivity.

The contractor's efficiency rate can also be used to estimate direct labor hours on future projects. If you know that a particular contractor's efficiency rate is **90%** and a job requires **300 standard hours**, then you can divide 300 by .90 to estimate that particular contractor is likely to require **333 hours** to complete the job.

Labor Standard

Labor standards are used to make realistic estimations of how long it should take to complete a job. A labor standard includes **leveled time**—the amount of time it takes an **average** worker under **average** conditions to complete a specified task. After leveled time is established, it needs to be adjusted to allow for personal time, fatigue, and unavoidable delays. The resulting metric is the labor standard.

Direct Labor Wage Rate

The direct labor wage rate is the composite hourly wage rate of those employees who can be charged directly to a specific task, work order, program, or contract. When assessing wage rates, cost analysts need to consider several factors:

- Geographic location
- Skill level required
- Size and stability of the workforce
- Duration of the contract

Overhead Costs

Overhead costs are **indirect costs**—costs that cannot be practically charged directly to a specific program or contract. Overhead costs generally fall into one of three overhead pools: **manufacturing** overhead, **engineering** overhead, and **material** overhead.

Manufacturing and engineering overhead include indirect labor, costs associated with labor, indirect supplies, and fixed charges.

Material overhead includes costs associated with the acquisition, transportation, handling, and storage of materials.

Other Costs

Other costs typically include such things as general and administrative (G&A) expenses, centralized service centers, profit (depending on the contractual agreement with the government), and the cost of money (if the contractor has significant capital assets dedicated to a particular government program).

Other costs vary from firm to firm—what one company categorizes as **overhead** may be categorized as **other costs** by another company. As long as it is in accordance with Generally Accepted Accounting Principles (GAAP), companies are free to use the accounting system that is best for their particular circumstances.

G&A expenses are a good example. While many companies categorize G&A as overhead, many others categorize G&A as other costs. Regardless of the category, the important thing is that G&A expenses are included when calculating the wrap rate.

Recovery Rate

In order to **recover** indirect costs, contractors need to allocate **overhead** and **other costs** to each program or contract they benefit. This is done by calculating the **recovery rate**—the total cost pool dollars divided by the relevant base.

Overhead Allocation

After the **recovery rate** is calculated for each indirect cost pool, the contractor applies each recovery rate to allocate a portion of the applicable indirect cost pool to each of the contractor's programs or contracts.

Wrap Rate Calculation

To calculate the wrap rate, you begin by calculating the **overhead costs** rate in accordance with the contractor's overhead base.

You calculate the **other costs** rate the same way—in accordance with the contractor's other costs base.

Finally to calculate the **wrap rate**, you add the **direct labor wage rate**, **overhead costs rate**, and **other costs rate**.

Fully Burdened Labor Cost Calculation

After you calculate the wrap rate, you can apply the wrap rate to direct labor hour estimates to forecast the contractor's future fully burdened labor costs.

Wage Rate Projection Methods

As a cost analyst, you will sometimes have to extend contractors' fully burdened labor rates beyond the time period covered by the negotiated forward pricing rate agreement. To do this, you may rely on statistical methods to forecast future labor rates.

Regression analysis is a statistical technique that illuminates how the value of a dependent variable, such as direct labor wage rates, changes in response to changes in one or more independent variables, such as time.

Simple moving average, **weighted moving average**, and **exponential moving average** are statistical methods used to smooth out short-term fluctuations in long-term data series.

Regardless of the statistical method you use, it is wise to consider other factors which may influence the contractor's future wage rates and adjust the statistically-generated wage rate forecasts accordingly.

Wage Rate Projections Applied

After you rely on statistics and your judgment to forecast future wage rates, the future wage rates, coupled with forecasted overhead and other costs can be used to project the contractor's future fully burdened labor cost and wrap rate.

Glossary

Term	Definition
Assembly	Assembly involves the effort to combine parts into subassemblies and assemblies.
Cost Objective	Cost objective is an accounting term for a task, work order, product, program, or contract. In government acquisition the cost objective is normally the program or contract.
Cost of Money	Cost of money is sometimes an allowable other cost, depending on the contractual agreement the contractor has with the government. The cost of money is the cost of capital committed to facilities as an element of contract cost. Department of Defense (DoD) pays additional money for the contractor to maintain the production facilities, operating lines, etc., for the duration of the contract.
Delay Allowance	Delay allowance is an adjustment applied when formulating a labor standard to allow time for unavoidable predictable and unpredictable delays.
Design Engineering	Design engineering involves delineating the characteristics and specifications of the end product.
Direct Labor Hours	Direct labor hours are hours that can be explicitly attributed to a particular task, work order, program, or contract.
Direct Labor Wage Rate	Direct labor wage rate is the composite hourly wage rate of those employees who can be charged directly to a specific program or contract.
Efficiency Rate	Efficiency rate indicates a contractor's productivity and can be used to estimate direct labor hours on future projects. Efficiency rate is calculated by dividing a task's standard hours by the actual hours the contractor required to complete the task, and then multiplying the quotient by 100. Higher efficiency rates (closer to 100%) indicate greater productivity.
Engineering Overhead	Engineering overhead includes the cost of directing and supporting the activities of the engineering department.

Term	Definition
Exponential Moving Average	Exponential moving average, when applied to time series data, is the average of the last X number of observations but with varying weights assigned to each observation. The most recent observation is assigned the greatest weight and each preceding observation is given an exponentially smaller weight. It is applied to smooth out short-term fluctuations in time series data and amplify long-term trends or cycles.
Fabricating	Fabrication involves the fashioning of parts from raw materials or purchased materials.
Fatigue Allowance	Fatigue allowance is an adjustment applied when formulating a labor standard to allow time for workers to recuperate from work conditions and health concerns.
Forward Pricing Rate Agreements (FPRAs)	Forward pricing rate agreements (FPRAs) are negotiated by the government with contractors to set the pay standard for a variety of skill sets within a specified geographical region.
Fully Burdened Labor Cost	Fully burdened labor cost includes direct labor, overhead, and other costs. It is calculated by multiplying the contractor's wrap rate by the direct labor hours.
Fully Burdened Labor Rate (FBLR)	Fully burdened labor rate, also called "wrap rate," includes the contractor's direct labor wage rate, overhead costs rate, and other costs rate. It is used when assessing contractors' proposals and making cost estimates.
General and Administrative Costs	General and administrative expenses typically include the expenses of a company's general and executive offices, staff services, and other miscellaneous activities related to the overall business.
Labor Standard	Labor standards are used to make realistic estimations of how long it should take to complete a job. A labor standard includes leveled time—the amount of time it takes an average worker under average conditions to complete a specified task. After leveled time is established, it needs to be adjusted to allow for personal time, fatigue, and unavoidable delays. The resulting metric is the labor standard.
Leveled Time	Leveled time is one component of a labor standard. Leveled time is the time that a worker of average skill, making an average effort, under average conditions takes to complete a required task.
Manufacturing Engineering	Manufacturing engineering involves planning the manufacturing process, developing process instructions and work methods, shop loading, organizing work stations, and matching shop capabilities to contractual requirements.
Manufacturing Overhead	Manufacturing overhead, also known as "manufacturing expense" or "factory burden," includes all production costs except direct materials, direct labor, and other costs.

Term	Definition
Material Overhead	Material overhead includes costs related to the acquisition, transportation, receiving, inspection, handling, and storage of materials.
Other Costs	Other costs are any other costs the firm incurs but has not accounted for as either direct or overhead costs.
Overhead Costs	Overhead costs, also called "burden," are indirect costs that benefit multiple programs or contracts, and therefore cannot feasibly be charged directly to just one.
Personal Allowance	Personal allowance is an adjustment applied when formulating a labor standard to allow time for workers to take care of personal needs.
Predetermined Leveled Time	Predetermined leveled times are based on basic motion standard data which capture basic body motions, such as reach, move, turn, grasp, position, release, disengage, and apply pressure.
Profit	Profit is sometimes an allowable other cost, depending on the contractual agreement the contractor has with the government. Some acquisition contracts allow the contractor to include an agreed-upon amount of **profit** in addition to their costs. This is usually in return for taking on a difficult, high risk project that requires a long-term commitment of time and capital.
Quality Assurance Engineering	Quality assurance engineering involves the formulation of standards and specifications for tests and inspections.
Quality Control	Quality control involves the act of testing or inspecting the product during the manufacturing process and prior to final acceptance.
Recovery Rates	The recovery rate is used by contractors to allocate overhead and other costs to each program or contract they benefit. Recovery rates are calculated by dividing the total indirect cost pool dollars by a relevant base.
Regression Analysis	Regression analysis is a statistical technique that illuminates how the value of a dependent variable, such as direct labor wage rates, changes in response to changes in one or more independent variables, such as time.
Reliability and Maintainability Engineering	Reliability and maintainability engineering involves designing and manufacturing products to meet longevity and repair requirements.
Service Centers	Service centers are included in many firms to provide company-wide services such as scientific computer operation, data processing, copying, technical typing, photographing, etc.

Term	Definition
Simple Moving Average	Simple moving average, when applied to time series data, is the average of the last X number of observations. It is applied to smooth out short-term fluctuations in time series data and amplify long-term trends or cycles.
Special Allowance	Special allowance is an adjustment applied when formulating a labor standard to allow time for infrequent, unpredictable occurrences, such as power failures, machine breakdowns, and minor repairs.
Standard Hour	Standard hour is defined as the number of hours a skilled worker will use to complete a given job under ideal or perfect conditions.
Standard Time Data	Standard time data is based on groups of motions (drilling a hole or painting a square foot of surface area) that are estimated as a single element.
Sustaining Engineering	Sustaining engineering involves as needed support as problems arise throughout the life of the contract.
Time Study	During time studies, industrial engineers observe and record the time that a selected worker requires to perform each of the subtasks in the work design. Several observations are required to average out random variations and assure that all elements of the work have been considered.
Weighted Moving Average	Weighted moving average, when applied to time series data, is the average of the last X number of observations but with varying weights assigned to each observation. Usually the most recent is given the greatest weight, and each preceding observation is given a progressively smaller weight. It is applied to smooth out short-term fluctuations in time series data and amplify long-term trends or cycles.
Work Sampling	Work sampling is commonly used to develop non-engineering standards. Estimates are based on the proportion of time spent by one or more persons on a given activity.
Wrap Rate	Wrap rate, also called "fully burdened labor rate," includes the contractor's direct labor wage rate, overhead costs rate, and other costs rate. It is used when assessing contractors' proposals and making cost estimates.