

# Rate Setting for Port and Harbor Facilities

A White Paper by Mike Fisher, Northern Economics

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A common need we see is the need to set appropriate rates for community-owned facilities like docks and harbors. Throughout Alaska, communities are facing the need to replace or improve the infrastructure that fuels their economic engine, yet they lack sufficient funds to fund the improvements internally. Rates charged for use have been too low, the city or borough has generated insufficient revenues, and the community doesn't have a replacement fund in place. When seeking out funding, the lending agencies have a common message: they want to see sustainable facilities. What can communities do to address this problem?

This white paper explores the topic of rate setting and discusses important aspects one needs to consider when arriving at a rate to charge for the use of a facility. The topic is applicable to all kinds of facilities, though the paper uses port and harbor facilities throughout as an example.

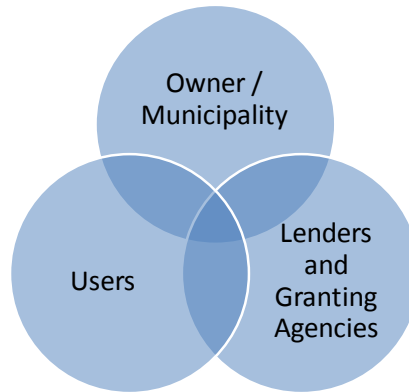
## Why Set Appropriate Rates?

Why do communities need to set appropriate rates? The issue boils down to sustainability. In a financial sense, port and harbor facilities need enough money coming in through various types of user fees (and other funding sources) to ensure that the facilities are maintained in the long term.

Each group with a stake in port or harbor infrastructure has its own set of needs for the facility with respect to sustainability. Most harbor facilities and many of the port facilities in Alaska are publicly owned. The major stakeholder groups for these facilities are the entity who owns them, the different users of the facilities, and the lending and granting agencies. The public is also a stakeholder, especially those who reside in the community and who benefit from the facilities either as direct users or purchasers of goods that are transported through the facilities.

Municipal port and harbor facilities provide a public access point to marine transportation and recreation. In many communities in Alaska, maritime and riverine facilities and transportation modes rival other types of transportation in terms of their importance, value, and accessibility. For a municipality, setting appropriate rates means being able to cover costs and ensure that long-term operations, routine and major maintenance, and eventual replacement (or decommissioning) are funded and able to occur as planned. The municipality has an obligation to maximize the benefit of the public resources and assets it owns, and to do so in a safe and ethical manner. Often, rates are set by balancing the costs of the facility with the community-wide benefits created by the port and harbor infrastructure.

**Figure 1. Facility Stakeholders**



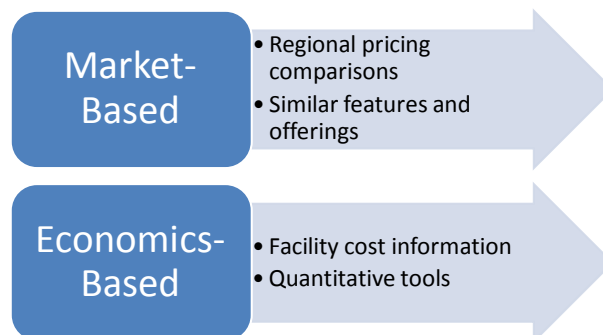
Users of port and harbor facilities want to ensure that the facilities are safe and functional. Each type of user, ranging from recreational to subsistence to commercial use, has its own needs, which means that there may be many functions and services provided by the facilities. All users, however, want rate structures to be understandable, rates to be fair and consistent, and allocation of costs to be equitable. The equity issue is a topic considered in a later section of this paper.

Lenders and granting agencies have an interest in a facility’s rates because they want to maximize the value of their investments. These agencies want new or expanded facilities to operate without the need for additional investment simply to cover operating shortfalls. In addition to seeing the facilities fully funded and operating long-term, lending agencies also want to see benefits accrue to the community and the region, such as job creation and retention, economic benefits and activity, and benefits to port and harbor users. Lenders have always wanted to see their investments lead to meaningful benefits and changes in a community and region. Their interest in these benefits has grown significantly in recent years, though, specifically with regard to sustainability and the continued enjoyment and maintenance of these benefits without the need for additional investment.

**Approaches to Rate Setting**

There are two general approaches to rate setting considered in this paper: market-based and economics-based. Arguably, other approaches may exist and could be useful, but these two approaches tend to be broad enough to cover most cases. As used here, market-based rates are those driven by what users will pay and economics-based rates are driven by the costs associated with a facility.

**Figure 2. Market-Based vs. Economics-Based Approaches**



Market-based rate setting usually comes into play when there are two or more facilities located somewhat close to each other and with comparable features and offerings. Similarity can be assessed using many factors. For example, for facilities that serve commercial fishing vessels, similarity can be gauged based on proximity to the fishery resource, vessel capacity, vessel sizes supported, and supporting infrastructure and services. For transportation-focused facilities, proximity to major shipping routes and cargo-generating industries is important, as are water depths, tides, equipment, uplands storage space, other transportation modes in the community, and approach channels. For recreational vessels and activities centered on the land-water interface, land access modes (such as highways and railways) and distances from population bases may be used to evaluate facilities' similarity.

It can be very tempting to set rates based on one's neighbors because (a) it's an easy approach (i.e., fast and inexpensive), (b) it results in rates that users in the area are willing to pay, and (c) it results in a more acceptable rate from a political standpoint. There is great danger, however, in using market-based rates without using some kind of economics-based approach to supplement and support the decision. Suppose Facility A wants to use rates currently in place at Facility B. Using the approach will work fine if Facility A and Facility B have identical costs, identical uses, and an identical user mix. This is rarely, if ever, the case, however, which means that Facility B's rates won't give Facility A the revenues it needs, or Facility B's per-[gallon, ton, container, etc.] rate won't be sufficient given the [gallons, tons, containers, etc.] handled at Facility A. In addition to the need for a perfectly-matched facility, using market-based rates also assumes that the owners of Facility B set appropriate rates and have followed through with their plan for necessary rate increases over time.

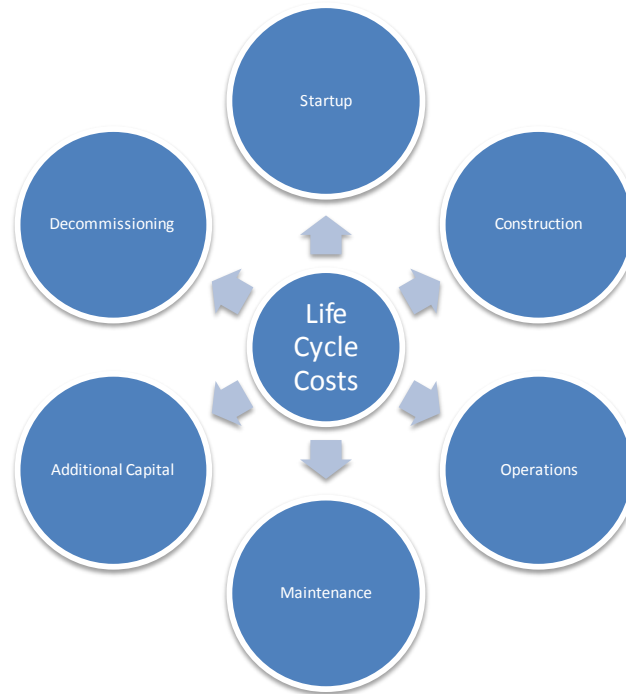
The challenges and potential problems of using market-based rates leads to the use of economics-based rates. As considered here, this category includes a broad range of tools and techniques used to create rate structures based on cost information and activity levels specific to a facility. Different types of cost information could include, for example, facility replacement costs, operating expenses, inflation adjustments, construction cost increases over time, and a facility's historical usage and experience. Ideally, all of this factors will be considered, but rates based on even a subset of these factors will be more appropriate than purely arbitrary or market-based rates.

"Economics-based rates" is a very broad term and can apply to many types of approaches to rate-setting. A technique called life cycle cost analysis is a good example of an economics-based tool. Life cycle cost analysis, as its name implies, evaluates the cost of a facility over its entire life, from initial concept and design to operations to replacement and decommissioning.

Life cycle cost analysis is often done as part of an alternatives analysis; if everything else remains the same on the revenue side (i.e., the facilities provide the same functional capacity), one can look at the life cycle cost of each alternative that meets one's needs and choose the least-costly alternative.

When thinking about what costs should be included in a life cycle cost analysis, the answer is just about everything. Life cycle costs include:

- Startup costs: design, permitting, etc.
- Construction costs: mobilization/demobilization, labor and materials, etc.
- Operations costs: labor costs, supplies, equipment costs, utilities, etc.
- Maintenance costs: routine maintenance, repairs, major maintenance, etc.
- Additional capital costs: planned upgrades, replacements, etc.
- Decommissioning costs: mobilization/demobilization, labor, disposal costs, salvage value, etc.

**Figure 3. Life Cycle Cost Categories**

When the timing of these costs is considered, a picture emerges of how a facility's costs are distributed over its life. Depending on choices made at each stage of the facility's life, the timing of costs can vary considerably, as can the allocation between startup and construction costs, operations and maintenance costs, and replacement and decommissioning costs. The choice of higher quality (and cost) upfront often leads to lower costs over time, reusability of older materials during decommissioning, and other savings. The opposite is often true as well. Evaluating these tradeoffs is in the realm of value engineering and optimization.

After determining the timing and amount of all costs, life cycle cost analysis uses the traditional net present value technique to come up with the present value of future cash flows. Generally, all of the cash flows are negative, but there may be positive, off-setting cash flows, such as salvage values. Comparing alternatives on a relative basis will also result in both positive and negative cash flows relative to the base amount.

Once calculated, the net present value represents the cost today of all of the anticipate facility expenses into the future. The net present value may also be converted to an annualized cost, which represents a series of identical payments over time, similar to a mortgage payment. This annualized cost provides a single, smooth, annual amount that can be used to cover all costs over time. When divided by an annual measurement of use, such as tons of cargo or linear feet of moorage space, one arrives at the rate that must be charged to cover costs at that rate of use.

While life cycle cost analysis is only one of many economics-based techniques for rate setting, it serves as a good example of a tool that can be used when a great deal of information is available at the facility. A demonstration of the technique is shown in a later section. Many other approaches exist under the "economics-based" umbrella and can be applied to different extents based on the amount of information available to make a rate setting decision.

We have looked at a large list of costs that could be covered by rates. The next section looks at these expenses more closely and suggests which costs need to be included in the rate.

## What Costs to Cover with Base Rates

Ideally, port and harbor facilities should cover their full costs with their user fees and perhaps some revenues from other sources that are generated from, but not directly paid to, the facility. Since this is not always the case, we'll look at different levels of funding and what they include.

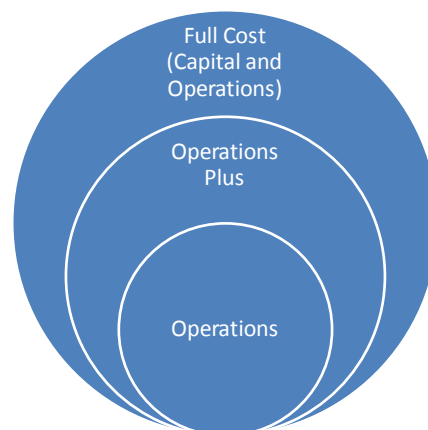
In many Alaskan communities, facility owners have difficulty charging sufficient rates to cover costs. This is due to a variety of issues, but in many cases either a comprehensive rate study hasn't been done (often with rates set by the market) or the rates were set years (or even decades) ago and not updated since then to reflect actual costs. While we always recommend that rates fully cover all of a facility's costs, we recognize that it may be a multi-year process to get to that point and often provide guidance on the steps needed to get to a fully-funded operation.

Once one has gathered all of the cost information for a facility, aided by the list of categories on the prior page, it is helpful to organize it into capital and operating costs. Generally, everything presented in the list is a capital cost, except for operations costs and routine maintenance costs. With costs grouped into capital and operating costs (or the annualized equivalent of each based on a life cycle cost analysis approach), the discussion can now turn to coverage of those costs.

Generally, funding may occur at three levels: the full cost (capital and operating costs), operating costs alone (operations and routine maintenance costs), or operating costs plus some portion of the capital costs. Ideally, rates will cover the facility's full cost, which means the enterprise should be able to operate indefinitely, as long as the rates keep up with changes in the cost structure and level of use.

At a minimum, operating costs (often abbreviated as O&M) need to be covered. There's an old saying about losing money on every transaction, but making it up on volume. Unfortunately, the strategy rarely works in the long-term. Though one might consider other factors, such as the facility providing the economic lifeblood of the community, if rates don't cover O&M, there's a strong argument for either drastic change or a shutdown of the facility. A drastic change is almost always preferable and, with the help of a proper rate study, the facility owner can generate support for the plan much more easily once the stakeholders understand the need for change and rationale behind the new plan.

**Figure 4. Funding Levels to Cover with the Base Rate**



If users can afford to pay rates in excess of operating costs but not enough to cover the full cost, the goal should be to cover as much of that gap as possible. When it comes time to replace or expand the facility, having some funds available means the community or enterprise fund will be able to provide a local match and down payment, reducing the amount of money that will need to be borrowed. A facility funded with 50 percent debt is better off than a facility funded fully with debt. Without any equity, the cost of the facility increases due to the increased interest expense, the facility's financial situation becomes more sensitive to changes in the level of use, and the risk of defaulting on debt payments increased.

No discussion about covering costs would be complete without a word about other local funding sources. Port and harbor facilities are undoubtedly economic drivers for many communities. The economic activity created by port and harbor facilities shouldn't be ignored as a source of funding or a benefit to sell to potential lenders and granting agencies. In communities where commercial fishing is a big industry, for example, the municipality's general fund probably receives shared fish tax revenues from the state. While these are general fund revenues, it is clear what drives them. Without port and harbor facilities, there wouldn't be as much commercial fishing activity, because the land-water interface wouldn't be there to connect product with processors and distribution channels. Within reason, and with proper documentation of the decision, it is perfectly acceptable to make transfers from the general fund to support the maritime facilities since those facilities have generated the revenues. What a community would not want to do is make transfers to subsidize a port or harbor facility without a rational basis for doing so. This simply postpones having to deal with facility revenue shortfalls and, perhaps more seriously, raises a red flag to potential funding and financing agencies.

Governmental Accounting Standards Board's Statement 34 requires that municipalities account for depreciation expense of their capital assets. This means that port and harbor assets need to be depreciated over time in the community's or enterprise fund's financial statements. While depreciation is a non-cash expense, it shouldn't be ignored. To the extent possible, think of that depreciation expense as a target for funding of a facility replacement fund. By depositing that money in a replacement fund and making it available for the next major capital expense, the facility will be much better off, both in terms of its condition and the attractiveness of the enterprise to potential lenders and granting agencies.

There are many other details to consider, and this discussion has only begun to scratch the surface. If this is the first time you've worked with this kind of information, it's advisable to talk with your finance director so you can gain an understanding of how these costs are handled.

## Challenges to the Rate-Setting Process

Once a rate plan has been prepared, the next step may be the most difficult: gaining acceptance and adopting the rates. Cost allocation and equity issues often play a major part in these difficulties.

Cost allocation is the process of allocating capital and operating costs to different user groups. This can be straightforward with dedicated facilities and singular uses, or it can be much more complex when dealing with multiple types of users and multiple activities at a common facility. Allocation decisions must be guided by an understanding of what drives costs. Factors driving costs might include:

- Frequency of use
- Total annual duration of use
- Total annual tons carried across or gallons carried through the facility
- Wear and tear based on vessel and equipment sizes
- Other quantifiable and measurable factors

Some operating costs, such as staff time, can be more challenging and may be driven by more qualitative factors. The most important part of the process is to use a consistent and transparent process so that it is clear how the results came about and it is easy to evaluate the effect of changing that process. Transparency is especially helpful when presenting a new rate structure to users or negotiating rates for a preferential use agreement.

A common concern when proposing rate changes, especially when long-term maintenance and replacement costs are involved, is that of equity. Users often ask why they should have to pay for facilities that are going to serve future users. There isn't a simple and satisfying answer to this question, though there are two ways to view the issue that may be effective in communicating the need to adjust rates.

First, it is important to recognize that failing to set appropriate rates places a burden on future users that current users didn't have to face. Heavily subsidized rates are attractive to most users. Few users, however, would choose to group together, build a brand new facility fully funded by their own money, maintain the facility over time with their own money, and, at the end of the facility's life (30 to 50 years), remove and dispose of all of the improvements (with their own money) and move on. In essence, this is happens without taking a long-term view in rate setting, except that users don't pay all of these costs; the government entity does.

Second, though current users often face significantly higher rates as a result of adopting a long-term approach than they do under a heavily subsidized situation, the new rates are no higher than they would have been had the long-term approach been followed all along. Current users aren't being asked to pay for future users' costs, but for their own, current costs.

From either angle, the issue is about if, and by how much, the government entity is willing to subsidize rates.

Another common concern from industry members and residents alike is that rate changes have to be considered in the context of the costs of operating in the region. Purchasers of goods brought in to a community ultimately have to pay the cost of bring those goods to their doorstep, which means that these operating costs ultimately come out of their pocket. (If not, then that service may go away, which also means the revenues generated by the activity go away.) For communities off of the road system, there are fewer options for transporting goods than there are in places on the road system. On the road system or with rail access, ports can optimize their user mixes and coordinate with other ports to reduce the overall cost of each type of good in the region. There isn't a simple answer to this issue, and relative costs fall away when there aren't any other options. The effect of rates simply must be considered in the overall cost of living and operating in the region.

Though thinking about cost allocation and equity issues may raise more questions than it answers, it's important to anticipate these issues ahead of time, rather than after a rate structure has been proposed.

## Life Cycle Costing Example

To illustrate the rate setting process, suppose a port facility handles 30,000 tons of cargo annually. We would like to set a wharfage rate to cover the full cost of the facility, based on that level of activity.

We anticipate that operating cost will be \$113,500 per year, consisting of \$100,000 of employee cost (including wages, benefits, and other costs) and several smaller expense items. We will assume constant year dollars, which means the rate will need to be adjusted over time to account for inflation. On the capital side, we anticipate paying for a \$5 million improvement in 2016 and a \$1 million improvement in 2020. Again, each of these amounts is in year 2011 dollars.

Table 1 summarizes the projected costs, in thousands of dollars, for 2011 through 2020. Operations and maintenance costs will continue for a total of 30 years, at \$113,500 per year in 2011 dollars.

**Table 1. Capital and Operating Costs for Dock Facility, Thousands of Dollars, 2011–2020**

	Year									
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Capital Costs</b>										
Dock Facility	0.0	0.0	0.0	0.0	0.0	5,000.0	0.0	0.0	0.0	1,000.0
<b>Operations and Maintenance Costs</b>										
Employee costs	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Office supplies	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Services	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Training	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Equipment	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Utilities	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
<b>Total Costs</b>	<b>113.5</b>	<b>113.5</b>	<b>113.5</b>	<b>113.5</b>	<b>113.5</b>	<b>5,113.5</b>	<b>113.5</b>	<b>113.5</b>	<b>113.5</b>	<b>1,113.5</b>

The Office of Management and Budget publishes a discount rate each year that is suitable for public infrastructure projects. For 2011, the rate is 4.5 percent. The discount rate is used to discount future cash flows to the present. The net present value of this facility's series of costs is just over \$6.6 million. The next step is to find an annualized equivalent cost for the next 30 years. This is similar to a mortgage payment calculation using a 4.5 percent rate and a total payment of \$6.6 million after the final payment. In this case, the annualized cost is \$108,962.

The final step is to find the amount to charge per ton in order to cover the annualized amount. Dividing \$108,962 by 30,000 tons gives us a cost of \$3.63 per ton. This rate, along with annual inflation adjustments, should cover the cost of the port facility over its life.

In the event the level of use were to change, an adjustment could be made to the rate. With greater use, the cost per unit of use would go down. For example, if cargo operations increased to 35,000 tons per year, the annualized cost would decrease to \$3.11 per ton. Likewise, if cargo operations dropped to 25,000 tons, the annualized cost would increase to \$4.36 per ton. Because of the rate's sensitivity to the amount of cargo handled, as well as to changes in capital and operating costs, it is beneficial to monitor costs and activity levels and periodically repeat the live cycle cost analysis.

## Conclusion

This white paper has examined the process of rate setting with a focus on port and harbor facilities. We've talked about the importance of setting appropriate rates as well as the tools used to set them, both economic and political. The intent of the paper was to look at some of the specifics of this common need, share a framework for doing a rate study, and present a useful tool for facility owners and operators.

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***For more information about rate setting and how Northern Economics can assist you with rate setting for your facility, please visit us at [www.NorthernEconomics.com](http://www.NorthernEconomics.com), call us at (907) 274-5600, or stop by our offices at 880 H Street, Suite 210, Anchorage, AK 99501.***

***This white paper was published at [www.HarborModel.com](http://www.HarborModel.com) in February 2011.***