PORT AND HARBOR ADVISORY COMMISSION
491 E. PIONEER AVENUE
HOMER, ALASKA

OCTOBER 9, 2013
WEDNESDAY, 5:00 P.M.
COWLES COUNCIL CHAMBERS

NOTICE OF MEETING
SPECIAL MEETING AGENDA

1. **CALL TO ORDER**

2. **APPROVAL OF THE AGENDA**

3. **PUBLIC COMMENT REGARDING ITEMS ON THE AGENDA**

4. **NEW BUSINESS**
   A. Memorandum from Port Director/Harbormaster Hawkins Re: Port of Homer Rate Study **Page 3**
      a. Port of Homer Rate Study – Northern Economics, Inc. **Page 7**

5. **COMMENTS OF THE AUDIENCE**

6. **COMMENTS OF THE CITY STAFF**

7. **COMMENTS OF THE CHAIR**

8. **COMMENTS OF THE COMMISSION**

9. **ADJOURNMENT/NEXT SPECIAL MEETING IS SCHEDULED FOR WEDNESDAY, OCTOBER 30, 2013 at 5:00 p.m.** in the City Hall Cowles Council Chambers located at 491 E. Pioneer Ave, Homer, Alaska.

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Memorandum

TO: PORT & HARBOR ADVISORY COMMISSION

FROM: BRYAN HAWKINS, PORT DIRECTOR/HARBORMASTER

DATE: OCTOBER 2, 2013

SUBJECT: NORTHERN ECONOMICS HARBOR RATE STUDY

In May 2013, the City of Homer entered into a contract with Northern Economics, Inc. to prepare a Port and Harbor Rate Study and an Economic Analysis of the Deep Water Dock. The first draft of this study was completed the end of September and is ready for the Port and Harbor Commission to review it. Once feedback is compiled and returned to Northern Economics, a revised draft will be submitted to City Council along with a presentation of the findings.

City Staff has been able to review the study; comments/suggestions that were made are as follows:

John Li, Finance Director

I haven't gotten the chance to be more familiar with this current Rate Study process. So, some of my comments may not be applicable or even making sense.

1. Can Northern Economics provide us with some other study results? In the draft, it did mention a recent study done for the City & Borough of Sitka (page 7). Some actual data would help us to understand our proposed rate change.
2. The Sensitivity Analysis addressed the effect of the rate change. Should there be a consumer impact analysis? How would the new rate affect consumer behavior (choosing to dock their boat somewhere else – a cost & benefit analysis from consumer perspective)?
3. The Replacement Cost approach as it claimed, it is to estimate the cost for replacing & maintaining the current level of service. The draft (page 10) recommended that the city should consider future expectations for the functionality of the facilities. Does this mean Port & Harbor, as an enterprise entity, should have a profit margin built in when setting up the rate (including fully fund the depreciation reserve).

Matt Clarke, Deputy Harbormaster

After reviewing the report, I would like to make three observations:

1. Page 2, Life Cycle Cost Approach: The study states: "Our analysis finds that the net present value of Port of Homer facilities' life cycle cost is $234.2 million. When expressed on an annualized basis over a 40-year period, annual costs of about $7.3 million need to be covered each year. Based on the assumptions used in the model about funding of capital Improvements and maintenance spending, operations and maintenance costs account for 70 percent of the annual total and capital costs account for the other 30 percent. This annualized cost is expressed in real terms, in 2013 dollars. Going forward, regular rate increases will be needed on an annual basis to account for inflation."

   Northern Economics uses R&M Consultant's net present value of $234.2 million for the entire port facility. Would it be prudent to procure net present value estimates from three or more engineering firms and "average" the values or "throw out the high and low" values? After all, the entire life cycle cost approach models are based on a single engineering firm's estimate. Recent cost analysis involving current capital replacement projects currently underway in the Port of Homer have revealed fairly significant "overestimates" originally produced by R&M Consultants.

2. Page 4, Capital Cost Data, Makes the Following Assumption: The study states: **"**Based on input from Port of Homer staff, the model assumes that all of the harbor-related capital projects will be funded 50 percent by some kind of a grant, such as the State of Alaska's Harbor Facility Grant Program. It is assumed that such funds will be available and that the timing of these projects can be varied as needed to meet grant requirements."

   Is this a safe assumption moving forward—assuming the state or federal governments will always provide 50% grant funding opportunity for infrastructure replacement projects?

3. Although the study is focusing on the required rate increase in order to meet life cycle capital costs, the real issue here is revenues and whether we can generate enough revenue to address LCCC. Economic laws affecting demand (and revenues) will likely be experienced as rate prices increase. Although we are a "regional monopoly", larger commercial vessels may choose other ports if rates are more attractive abroad. Smaller vessels that are "trailer able" may opt-out of moorage, use the L&L Ramp, and dry land storage. Supply & demand as a function of moorage rates/price…….the question is, what rate will yield maximum revenues?

Bryan Hawkins, Port Director/Harbormaster

I have a couple of ideas that may or may not help. As I see it, the issue is the estimated facility value at $234 million is a lot to take in one bite and I think we may want to get a bit more detailed in this estimate. Basically, I'm challenging the concept that the enterprise would in reality be held responsible for full replacement costs of our dock facilities.

- FISH DOCK
  - 30 year old facility
  - Built entirely with grant monies
  - Maintained using enterprise staff and money since it was first opened
  - Operation and maintenance costs are well documented

  If we lost this facility overnight, is it realistic to assume that the enterprise would be entirely responsible for replacing it? I don't think it is. Homer's Fish Dock is a special situation given that it has been managed to encourage competitive fish prices, which has drawn a lot of fish to our town over the years. If you follow the money coming from the fisheries landing tax, you'll see that every year millions of dollars are collected from the fishermen who deliver to Homer's Fish Dock. This money then goes into the State's Fisheries Tax Program and General Fund coffers. Why would we be expected to replace this facility when all the Enterprise has been able to fund with the money we collect at the fish dock is maintenance and operations?
  The real money leaves town with the fish.

- DEEP WATER DOCK

  Look at our Deep Water Dock expansion plans. Estimates show this expansion will run over $30 million. There is no way that the enterprise will be able to fund that kind of improvement; we will be looking for federal and state funding to build. The City will have to justify this improvement showing local, regional, and national benefits in order to find the money to construct. The $3 million dedicated for the Deep Water Dock expansion feasibility study came from a federal transportation grant. This further makes my point that the regional benefits justify dock facilities.

- PIONEER DOCK

  Completed in 2003, this dock was funded using federal, state, and enterprise dollars. Because of the use agreement with AMHS, the dock face (the money making end) is in reality a ferry dock. The side berth is dedicated to the USCG Cutter Hickory, and, since 9/11, gates have been installed to limit our ability to roll trucks or equipment on and off the dock. The bottom line is that the enterprise does not have much opportunity to collect much more then basic maintenance and operations costs. Building a reserve for replacement monies on the Pioneer Dock could never be accomplished in the enterprise because of these agreements. For these reasons the enterprise customers should not be taxed with replacement costs for this dock.

- Look at some of our recent regional dock construction activity:
  - Port of Anchorage: Their port improvement project is really a dock replacement and expansion project. The old dock had to be replaced, which drove their decisions to expand. Where are their construction dollars coming from? I'm pretty sure it isn't all Port enterprise-funded construction.

  - Kodiak: The Port and harbor of Kodiak are replacing two of their ocean docks. The first one is their cargo dock, used for containerized freight, which is a $30+ million dock replacement project that is being fully funded (no local match) using state dollars. That includes feasibility, design, and construction. The second dock is their ferry/cargo dock in the channel, which is being fully funded by the Alaska Marine Highway system with no local match required.

I believe we should make some adjustments to the rate study showing the Fish Dock, Pioneer Dock, and Deep Water Dock life cycle costs as a separate expenditure. These expenses wouldn't work to set rates for replacement but for maintenance costs. We could bump the maintenance costs to cover some of the bigger ticket items, cathodic protection, fender replacement, pile repair, basic concrete repair, etc.

Responses to Staff from Mike Fisher, Northern Economics

Thanks for sharing the comments gathered thus far. You and your team have provided some good comments. Some are easy to address and others are good big-picture comments that would be interested to do but are unfortunately outside the scope of what we can do under this contract.

At this point, the only real item I see that could be addressed (and maybe this is just prep for the meeting and not a change to the report) is the impact of not including that 50% match (which Matt questioned), though you also commented that you didn't see the Port being able to charge facilities at their full cost. Otherwise, most comments point to the need for more information (such as the breakdown of costs in R&M's estimate and clarification of the recommended changes in light of recent rate changes).

John asked about the Sitka work. That can be accessed here, near the bottom under Harbor System Master Plan: http://www.cityofsitka.com/government/departments/harbor/

Recommendations

Attached is the current draft of the Harbor Rate Study. Please carefully review the document, Staff's comments, and be available to provide further comments/suggestions at the special meeting October 9, 2013.

Attached: Northern Economics, Inc. Port and Harbor Rate Study First Draft

Memorandum

Date: September 25, 2013

To: Bryan Hawkins, City of Homer

From: Mike Fisher, Northern Economics, Inc.

Re: Port of Homer Rate Study

This draft memorandum presents the findings of a rate study Northern Economics, Inc. conducted for the Port of Homer. Findings of the rate study are presented first, followed by discussions about the life cycle costing approach used, assumptions, benefits of the port to the city, and sensitivity of the results to changes in the assumptions. The memorandum then discusses other factors that can affect rates, including funding considerations, changes in vessel sizes over time, and alternative moorage rate structures, followed by documentation from R&M Consultants about the cost estimating approach used.

Findings and Recommendations

Our life cycle cost approach to calculating rates suggests that an overall rate increase of 57.1 percent is required for the port and harbor to cover all operations, maintenance, and replacement costs.

The recommended rate increases vary by facility. After allocating shared and overhead costs to each facility, required rate increases range from 29 percent for the Pioneer Dock to nearly 140 percent for the Fish Dock. Of the six facilities split out in this analysis, only one currently generates revenues in excess of its life cycle costs: the ramp.

Table 1 shows the annualized cost for each facility, the annualized cost for each revenue-generating facility once overhead costs are allocated, and the recommended rate increase for each facility.

Table 1. Annualized Costs and Recommended Rate Increases by Facility

Facility	Annualized Cost ($)	Annualized Cost with Allocated Overhead ($)	Required Rate Increase (%)
Port-Harbor Administration and Other Facilities	1,428,974	-	-
Harbor	2,903,031	3,688,967	47.91
Pioneer Dock	388,315	584,799	29.44
Fish Dock	1,622,222	1,872,293	138.54
Deep Water Dock	868,175	1,011,072	55.01
Ramp	29,622	29,622	-85.78
Fish Grinder	27,288	80,874	136.52
Total	**7,267,628**	**7,267,628**	**57.1**

Based on these findings, Northern Economics recommends the Port of Homer aim to increase its rates an average of 57 percent across the board, in addition to regular inflation-based increases each year thereafter, if it wishes to fully fund its facilities. In lieu of an immediate and full increase, it might consider a series of large increases spread over the next several years. While this will not necessarily raise funds sufficient for major maintenance and repair projects in the near term, it will make passage of these rate increases less burdensome on users.

Life Cycle Costing Approach

The life cycle cost of a facility combines its acquisition or construction, operations, maintenance, and replacement costs over its useful life. This forward-looking approach uses the time value of money concept to "discount" future life cycle costs over a set period of time (2013–2052 in this case) to a single net present value in 2013 dollars.[1] That cost is then annualized to arrive at an annual portion of the facility's life cycle cost that needs to be covered by revenues.[2]

The Port of Homer's average annual operations and maintenance costs, based on 2008–2012 expenditure levels, are approximately $3.4 million, based on our analysis of the harbor system's financial data. Transfers back to the general fund add another $0.4 million for total annual costs of $3.8 million. Capital costs vary each year based on the projects the Port of Homer undertakes; on average, the projects included in the model account for about $2.5 million annually, though the timing of those projects results in no anticipated capital costs in some years and as much as $30 million in other years. Service life varies by the type of infrastructure and ranges from 20 to 50 years.

Our analysis finds that the net present value of Port of Homer facilities' life cycle cost is $234.2 million. When expressed on an annualized basis over a 40-year period, annual costs of about $7.3 million need to be covered each year. Based on the assumptions used in the model about funding of capital improvements and maintenance spending, operations and maintenance costs account for 70 percent of the annual total and capital costs account for the other 30 percent. This annualized cost is expressed in real terms, in 2013 dollars. Going forward, regular rate increases will be needed on an annual basis to account for inflation.

Model Assumptions

The life cycle cost model is built with several assumptions that allow for adjustment of the results. Assumptions used in the model[3] are shown below, arranged by worksheet:

Interface

- **Discount Rate:** A real discount rate of 1.10 percent is used, based on the 30-year real rate in the current version of OMB Circular A-94.

[1] The life cycle cost model assumes a real discount rate of 1.1 percent per U.S. Office of Management and Budget guidance (OMB 2012).

[2] For more information about life cycle cost analysis and rate setting, please see "Rate Setting for Port and Harbor Facilities" (Fisher 2011) and "Setting Sustainable Harbor Rates" (Fisher 2009). The location of the white paper and presentation, respectively, are shown in the references section.

[3] The model uses blue highlighted cells to indicate assumptions that the user can change in the "Interface" and "Allocation Matrix" worksheets. Most other cells are protected (without a password) to protect model fidelity.

- **Percentage of Capital Costs to Include in LCCA:** The base assumption is that the analysis includes 100 percent of capital costs, not including grants identified for specific projects.[4]
- **Include Transfers in Life Cycle Cost Analysis:** By default, the analysis assumes that the Port of Homer will continue to make transfers to the City of Homer.
- **Life Cycle Cost Analysis Period (Years):** The model uses a 40-year period for analysis.
- **Maintenance Cost (Percentage of Capital Cost):** The analysis assumes an annual maintenance cost of 3 percent of capital costs, which covers both replacement of facilities and their annual maintenance.

Allocation Matrix

- Costs generated by the Homer Harbor, Pioneer Dock, Fish Dock, Deep Water Dock, Ramp, and Fish Grinder are allocated to those facilities. Costs generated by administration and other activities would be allocated to the six main facilities according to the following schedule:
    - 55.00 percent to Homer Harbor (48.75 percent operations, 6.25 percent maintenance)
    - 13.75 percent to Pioneer Dock
    - 17.50 percent to Fish Dock
    - 10.00 percent to Deep Water Dock
    - 0.00 percent to Ramp
    - 3.75 percent to Fish Grinder

Rate Adjustment

- The rate adjustment sheet uses the rate from one service offered at each facility as a proxy for rate inflation at that facility. Revenues from each facility over the 2008–2012 period are adjusted according to this rate inflation in order to determine how use has varied over time and to determine a rate-inflation-adjusted average of revenues generated at each facility. The rates used to account for rate inflation are moorage rates for Homer Harbor, dockage rates for Pioneer Dock, seafood wharfage for Fish Dock, dockage rates for Deep Water Dock, and the per-day launch fee for the Ramp.

Inflation Adjustment

- The U.S. Bureau of Labor Statistics produces the Consumer Price Index (CPI), which reflects changes in the cost of living based on a market basket of goods. Anchorage is the only community in Alaska for which a CPI is calculated. Homer and other communities use the Anchorage CPI as a basis for rate changes and other cost of living adjustments. As with the adjustment of revenues in the "Rate Adjustment" worksheet, on this worksheet the model uses inflation to adjust expenditures to a 2013 equivalent for purposes of understanding how expenses have changed over time other than through inflation.

[4] Based on discussions with Port of Homer staff, the model assumes that harbor-related projects will be timed so that they can take advantage of the State of Alaska's 50/50 matching harbor grants. The model also assumes that funding from NOAA or another agency will cover 25 percent of the cost of removing of the inner timber dock from the Pioneer Dock.

Capital Cost Data

- R&M Consultants and Port of Homer staff collaborated on an infrastructure replacement schedule. R&M Consultants provided replacement cost estimates and replacement years as shown on this worksheet.
- Based on input from Port of Homer staff, the model assumes that all of the harbor-related capital projects will be funded 50 percent by some kind of a grant, such as the State of Alaska's Harbor Facility Grant Program. It is assumed that such funds will be available and that the timing of these projects can be varied as needed to meet grant requirements.

Moorage SF and LF

- Port of Homer staff provided estimates of the square footage of moorage space in Homer Harbor (Hawkins 2013). Northern Economics also used this information to develop estimates of total linear footage. This was used to evaluate required rates under different arrangements.

Benefits to the City of Homer

In addition to revenues generated within the port, the Port of Homer provides other financial and economic benefits to the City of Homer.

The Port of Homer makes transfer payments each year to the general fund to support other city functions. Table 2 shows the transfer payments made each year for 2008–2012.

Table 2. Transfer Payments from Port of Homer to City of Homer, 2008–2012

Year	Transfer Payments ($)
2008	354,530.00
2009	354,530.00
2010	354,530.00
2011	500,000.00
2012	484,252.25

Source: Tussey (2013) and Northern Economics, Inc. analysis

The Port of Homer also generates sales tax revenues that flow to the City of Homer's general fund. Table 3 summarizes the sale tax revenues generated each year for 2008–2012.

Table 3. City of Homer Sales Tax Revenues Generated by the Port of Homer, 2008–2012

Year	Sales Tax Revenues ($)
2008	111,608.39
2009	123,035.51
2010	120,851.11
2011	127,548.29
2012	132,580.52

Source: Moore (2013)

Port of Homer users also generate additional spending and economic activity elsewhere in the community. This activity is generated from a wide variety of users, from charter operators whose

customers stay and eat out in Homer, to recreational vessels restocking on groceries, to commercial vessels undergoing repairs and stocking ship stores. Though these broader economic impacts are outside the scope of this rate study, another Northern Economics study underway concurrently looks at the economic impacts of spending on dockage, goods, and services in Homer by Buccaneer Energy's jack-up rig Endeavor.

For additional discussion of how ports and harbors can contribute to the local economy, please see "Ports and Harbors Create Economic Activity" (Fisher 2010), as noted in the references section.

Sensitivity Analysis

After completing our analysis of life cycle costs and the implications for rates at facilities within the Port of Homer, we evaluated the sensitivity of those rates to changes in the assumptions outlined above. The following tables and discussion demonstrate the effect of changes in assumptions about capital costs, transfers, and maintenance costs on the facilities' life cycle costs and required rate increases.

Table 4 shows the sensitivity of the life cycle cost of each facility to the percentage of capital costs included in the analysis. As seen in the table, as the capital costs go from the full amount (less grants, as discussed in the assumptions) to 0, the total life cycle cost drops from $7.3 million to $3.9 million. The change in life cycle costs varies by facility, depending on the mix of capital and operating costs that feed into each facility. The Pioneer Dock and Deep Water Dock have the most sensitivity to capital costs.

Table 4. Annualized Cost of Each Facility Based on Percentage of Capital Cost to Include in LCCA

	Percentage of Capital Cost to Include in LCCA				
Facility	**0**	**25**	**50**	**75**	**100**
Total	3,892,806	4,435,060	5,362,568	6,315,098	7,267,628
Port-Harbor Administration and Other Facilities	1,288,282	1,296,042	1,338,836	1,383,905	1,428,974
Harbor	1,443,492	1,579,034	2,007,676	2,455,353	2,903,031
Pioneer Dock	127,113	170,654	242,003	315,159	388,315
Fish Dock	841,853	1,014,011	1,215,479	1,418,850	1,622,222
Deep Water Dock	137,422	320,110	502,798	685,487	868,175
Ramp	29,622	29,622	29,622	29,622	29,622
Fish Grinder	25,021	25,588	26,154	26,721	27,288

Source: Northern Economics, Inc. analysis

Table 5 shows the sensitivity of the required rate increase to coverage of capital costs, as discussed above (Table 4), and the inclusion of transfers in the analysis. As the table shows, current rates cover somewhere north of 25 percent of capital costs; if only 25 percent of capital costs are covered, then the required rate increases are negative. Also of note in the table is that about 9 percent of the required

rate increase is due to transfers; stated differently, about 9 percent of revenues end up feeding back to the City of Homer for use in providing other services.

Table 5. Sensitivity of Required Rate Increase to Coverage of Capital Costs and Transfers

Percentage of Capital Costs Covered	Coverage of Transfers	
	Included	Not Included
	Required Rate Increase (Percent)	
0	-15.84	-24.81
25	-4.12	-13.08
50	15.94	6.97
75	36.53	27.56
100	57.12	48.15

Source: Northern Economics, Inc. analysis

Table 6 shows the sensitivity of the required rate increase to coverage of maintenance and capital costs. The maintenance cost amount shown in the table includes both facility replacement as well as regular and periodic major maintenance. A rule of thumb is that port and harbor facilities should aim to set aside 3 percent of the capital cost of facilities each year to cover these expenses. Measured this way, current maintenance spending at the Port of Homer is 1.76 percent. As seen in the table, reading across the columns, as the coverage of capital costs increases, the effect of maintenance targets has a greater effect on the required rate of return. There is no noticeable effect at the 0 percent and 25 percent coverage levels for capital costs, since this is under the threshold of what the Port of Homer already covers; once 50 percent or more of capital costs are covered, increasing the maintenance target from 1.75 percent to 3 percent results in an increasing required rate of return. With capital costs fully covered, the current level of maintenance warrants a 31 percent rate increase. This amount grows to the recommended 57 percent increase as the maintenance target moves up to 3 percent.

Table 6. Sensitivity of Required Rate Increase to Coverage of Maintenance and Capital Costs

Percentage of Capital Cost Covered	Target Percentage of Maintenance Costs Covered (Percent)					
	1.75	2.00	2.25	2.50	2.75	3.00
	Required Rate Increase (Percent)					
0	-15.84	-15.84	-15.84	-15.84	-15.84	-15.84
25	-4.12	-4.12	-4.12	-4.12	-4.12	-4.12
50	7.61	7.61	7.61	9.03	12.48	15.94
75	19.33	19.33	20.99	26.17	31.35	36.53
100	31.05	31.05	36.40	43.31	50.21	57.12

Source: Northern Economics, Inc. analysis

Funding Considerations

The analysis has assumed that all costs will be covered by funds on hand and other sources of "free" money. In reality, many port and harbor projects are funded by debt. It is important to recognize that the use of debt will change the required rate of increase specified in the model.

A recent study done for the City and Borough of Sitka found that using debt to fund some portion of a capital project will result in an increase in the required rates for that facility. This held true even when the interest rate on the debt was lower than the discount rate assumed in the model.

There are three primary factors that cause this result:

- First, the amount of debt issued will exceed the proceeds from the debt issue. This gap is due to financing costs—typically covered by the proceeds—that reduce the amount of money that can be spent from the issue.
- Second, using debt creates an obligation for regular repayment, and therefore places constraints on cash flows. This reduces flexibility in the timing of cash disbursements.
- Third, using debt will often result in debt coverage requirements. The requirements specify how much operating cash flow must be generated relative to the debt payment amount. This increases the burden on the debt issuer, because it increases the revenue that must be generated in order to satisfy the requirement.

Discussion about Vessel Size Changes and Alternative Moorage Structures

Homer, like many other ports, has seen a growth in vessel widths (beams) over time. As vessels have become wider, in particular 58-foot limit seiners, it has been a challenge to fit them side-by-side in the appropriate length of stalls. To alleviate some of the problems of mooring limit seiners, Homer has placed them in 75-foot stalls, but the seiners are still overly wide for those longer stalls.

One hypothetical approach to addressing abnormally wide vessels is to charge area-based moorage rates. Under this approach, the moorage fee would be calculated based on some dollar amount per foot of length and per foot of beam. The City of Kodiak is the only community with which Northern Economics has worked that has considered a square-footage-based rate publicly, but it has not implemented such a rate structure.

An alternative approach is to use tiered or graduated moorage rates. Though this does not directly address abnormally wide vessels, it does take into account the increased space and physical requirements of longer vessels.[5] For this reason, tiered rates that increase for larger vessels can be seen as providing the benefits of a more equitable sharing of facility costs and a better match between moorage revenues and the costs associated with constructing and maintaining facilities for vessels of different sizes. Under this approach, the per-foot moorage rate increases as vessels become longer.

Based on moorage rate information we have collected, the only community in Southcentral Alaska that uses some kind of non-linear or graduated rates in its harbor is Kodiak. Other harbors elsewhere in the state charge graduated rates as well, perhaps amounting to one-third to one-half of all harbors.

Port of Homer staff provided information about the square footage of its moorage facilities. Using this information, Table 7 presents hypothetical rates for a square-footage-based moorage rate. The total linear footage and corresponding rate is shown as well, for comparison.

Using these rates as an example, if a 58-foot long, 20-foot wide vessel were to moor under these rates, including allocated costs, the square-footage-based moorage cost would be $5,659.73, while the linear-

[5] Longer vessels requiring a large turning basin than smaller vessels, in addition to the float length required. In addition, longer vessels create more physical stresses on harbor infrastructure, especially when it is windy, requiring stronger structures. For additional discussion about the impact of vessel size on harbor configuration, please see “Float Layout and Economic Modeling Program” (Fisher 2005), as noted in the references section.

footage-based moorage cost would only be $4,100.74. If the vessel were 28 feet wide, the linear rate would still be $4,100.74 but the square-footage rate would increase to $7,923.63.

Table 7. Comparison of Moorage Rates Based on Linear Feet and Square Feet of Facilities

	Harbor Only	With Allocated Costs
Harbor Annualized Cost ($)	2,903,031	3,688,967
Annual Moorage Rate, Per Square Foot ($/sf)	3.84	4.88
Annual Moorage Rate, Per Linear Foot ($/lf)	55.64	70.70
Required Rate Increase based on linear footage rate (%)	39	77

Source: Northern Economics, Inc. analysis
Notes: Homer moorage facilities encompass 756,079 square feet (Hawkins 2013) and 52,176 linear feet.

Cost Estimating Approach (Provided by R&M Consultants)

R&M Consultants provided cost estimating support for this project. The following documentation was provided by Kim Nielsen, PE, of R&M Consultants along with their cost estimates.

> This memo provides a narrative to describe our approach to estimating replacement and maintenance costs for this project. It is understood that this is a generalized study to provide input to NEI's model to assist the City of Homer (City) with assessing a revised rate schedule for the port and harbor facilities. The cost estimates provided herein are based on today's dollars and the estimated cost to replace the facilities with modern facilities that meet today's codes and standards. For example, floats that currently are too narrow or gangways that are too short to meet ADA standards were valued as being replaced with larger structures and include all water, fire protection, and power/lighting utilities whether or not the existing structures are equipped with these items. Our replacement cost estimates do not include provisions for expansion or for accommodating new or differing uses. For example, they do not include modifications to the float system arrangement for a fleet of larger vessels.
>
> The enclosed spreadsheet provides an itemized list of each facility, the estimated replacement cost, the typical service life, an estimated extension of service life based on the fact that the City has a relatively good maintenance program for most facilities, and the corresponding date when the replacement would occur.
>
> In order to estimate a structure's remaining service life, it is important to obtain information on the original design, any previous maintenance, the current and anticipated loads on the structure, and most importantly, the existing condition of the structure. As with any assessment, the better the information gathered, the closer the estimated service life will be to that actually determined. The better the estimate of the remaining service life, the more feasible the decisions made concerning short- and long-term planning, maintenance, repair, and possible replacement of the facility.
>
> The service life and extension of service life based on maintenance included in this evaluation are estimates based solely on engineering judgment and averages for well-maintained facilities in Alaska. A detailed condition assessment has not been performed as part of this effort. The most recent condition assessment report provided by the City is from 2002 and covers a portion of the float system facility. The City of Homer Harbor Office has been consulted to verify the estimate of the remaining service life of the individual facilities.
>
> Although the service life estimates provided here are probably sufficient to obtain a general understanding of the relative priority and expected replacement costs for the City's waterfront

facilities, we recommend that the City incorporate a program to conduct routine inspections of all of its facilities, which would include assessing the overall condition of each facility, assigning an assessment rating, and recommending specific actions for future maintenance activities, including a timeline and order of magnitude costs for rehabilitation work. Routine Inspections generally should be performed no less than every 5 years and more frequently for facilities in less than satisfactory condition. This represents a proactive, rather than reactive, approach to maintenance and allows planners to properly plan and budget for major maintenance and renovation projects—thereby extending the life of facilities.

The owner should not rely solely on expected service life to estimate replacement of a facility. Functional suitability is also an important factor. For example, many 50 year old bridges and docks are in serviceable condition but are functionally obsolete in that they don't handle current highway or berthing loads or have proper lane width, turning area, or crane capacities, etc. Similarly, float systems built 30 years ago do not comply with current codes or modern standards/expectations for marinas with respect to fire suppression systems, steel restraint piling, potable water, power and lighting systems, corrosion protection, proper float widths, and adequate ADA access. The replacement cost estimates provided herein address this by assuming that the facilities will not be replaced with in-kind facilities (i.e., insurance values), but will be replaced with facilities of the same basic size and type but upgraded to modern standards. In addition, we have included an estimate of mobilization cost and engineering and permitting, which were distributed to each individual facility. In the case of the float systems, which have been broken down by main float rows, the expectation is that several main float systems will be replaced as part of a single contract. Approximately 20 estimate contingency was added to each item to account for inaccuracies associated with this budgetary level cost estimate. Estimates do not include costs for any initial field investigations (i.e., geotechnical investigation, survey), project management, bidding support, or construction administration. NEI has included an estimate for inflation.

In addition to the capital cost for replacing facilities, maintenance costs must be considered. There are several ways to estimate maintenance costs:

- As an annual cost based on a percentage of initial capital costs, typically 1 to 5 of the capital cost per year. Items like machinery typically have higher maintenance. This would include the items such as the restroom facilities, ice plant and cranes.
- As periodic major maintenance/renovations at specific milestones (i.e., every 5 or 15 years).
- As an estimate based on historical maintenance budgets for similar facilities.

We recommend that NEI use a percentage of capital cost to estimate annual and periodic maintenance that should be expected. An average percentage of 3 is a reasonable amount that could be used for the current purposes. The specific percentage budgeted for maintenance should be verified against the City's historical maintenance expenditures and adjusted accordingly.

Another way to estimate maintenance is a scheduled renovation project at certain milestones. This is a more specific approach that may be incorporated into the City's routine inspection program. For example, periodic renewal maintenance such as painting every 5-10 years and major remodel or renovation projects such as re-siding or re-roofing every 20 years. For floats and docks, for example, it may include routine condition inspections and minor repair/renewal projects such as removing marine growth, re-lamping light fixtures, or tightening thru-rods in floats every 1 to 5 years and re-coating, replacing corrosion protection and/or re-decking

projects every 15 years. This would provide a more specific approach to planning for maintenance. However, the percentage estimate may be sufficient to program funding over the lifetime of the facilities. For example, if the dollars budgeted for a facility are not spent in Years 1-4, then the cumulative amount saved may be spent on a renovation project in Year 5. This may or may not work well depending on the City's fiscal planning approach.

It should be noted that in order to properly prioritize budgeting for facility replacements and plan for future demand, the City should consider factors such as future expectations for the functionality of the facilities. For example, the number and arrangement of harbor float slips are currently geared toward a smaller vessel fleet, whereas the current trend is leaning toward a higher demand for larger vessels. For example, this may mean that planning may not be straightforward for Float System X with 40ft stalls and Float System Y with 24ft stalls, which are reaching the end of their expected service life in 2015 and 2020, respectively. Instead of replacing these facilities at the end of their service life dates, planning may instead prioritize Facility Y for replacement in 2016 in order to convert the facility to accommodate larger vessels, whereas Float System X may instead receive a major refurbishment in 2015 in order to extend its service life a few more years.

Similarly, the City Dock was recently upgraded with a more robust fender system to allow cruise ship berthing to meet that demand and we understand that the City is interested in expanding the City Dock to increase the wharf face and its load capacity in order to accommodate increased demand for barge landings and offloading. These types of upgrades are not accounted for in the following cost estimates. A more detailed Master Planning effort is recommended to properly prioritize and budget for these kind of future projects. However, the cost estimates and projections provided in the attached spreadsheet should provide a general overview and rough order of magnitude of what will be required to maintain and ensure continued properly functioning port and harbor facilities, similar to those that exist now.

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