
EMERGING SECTOR SERIES:
Boat and Ship Building

Presented To The Alaska Division Of Economic Development



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I. Executive Summary

For a state with a limited manufacturing base, Alaska is home to a longstanding boat and ship building industry. The importance of marine transportation, commercial fisheries, subsistence, and the visitor industry ensures that ships and boats are heavily used in Alaska. Vessels built in-state range from ferries several hundred feet in length to small recreational watercraft. The companies that build them can be found in Fairbanks, Homer, Anchorage, Ketchikan, and Wrangell to name a few, and they include industrial manufacturers, product innovators, and artisans. Alaska's deep maritime expertise and relatively large market for water craft makes boat and ship manufacturing a unique area of competitive advantage.

These factors make the boat and ship building sector a subject of interest to economic developers, policymakers, and business leaders. This study, the first in the University of Alaska Center for Economic Development's Emerging Sector Series, attempts to assess and define the growth potential of the industry, along with strategies to support this growth. While a variety of prior industry reports, studies, public data, and plans helped to shape this study, the research team focused the bulk of its effort on the testimony from businesses that build vessels.

A total of 14 in-depth interviews were conducted with owners and managers from these companies, accounting for about half of the state's boat and ship builders, including the largest firms by employment in the sector.

This report was completed with support from the State of Alaska Department of Commerce, Community, and Economic Development (DCCED), Division of Economic Development (DED).

Key findings from the research include:

- **Vessel builders succeed by focusing on customization and specialty products.** These companies succeed by offering watercraft that are uniquely suited to Alaska conditions, or that can be built to the specific preferences of the customer. Because of this customization, many of companies do not see themselves as having direct competitors.
- **The sector is fertile ground for entrepreneurship and innovation.** Boat builders in the state are launching companies or new products around use of new materials like thermoplastic, novel hull designs, and electric propulsion. One boat builder interviewed in this study is launching software to improve cost estimation.
- **Builders use a blended business model that combines manufacturing and service.** Nearly all of the companies identified perform maintenance and service as well as building vessels. Companies can generate year-round revenue and employment by building and servicing vessels. While service work is higher margin, it is also highly seasonal, and vessel construction often takes place in the winter season.
- **Workforce development is paramount for the sector.** Most of the companies interviewed mentioned workforce skills and readiness as a major challenge. Concerns ranged from a demand for specific skills like welding to basic employee reliability.

The interviews and background research also yielded a number of potential strategies for Alaska policymakers and economic development practitioners to aid the growth of the boat and ship building sector. These recommendations are:

- **Develop shared marketing services and Alaska-built brand for boats and ships.** Many established boat and ship builders attract customers primarily through word-of-mouth, and some lack online presence. Some companies mentioned a desire for marketing assistance. One potential solution is a shared marketing effort to promote and brand Alaska-designed and built boats, and to help customers find local companies to build custom vessels. Maine's MaineBuiltBoats.com offers one model for promoting local and artisanal boat building; others include the existing State of Alaska Made in Alaska and Alaska Grown programs. This marketing effort could be led by a coalition of boat and ship building businesses, a trade association, or a government entity.
- **Expand technical assistance offerings for maritime businesses.** Building boats requires complex cost estimation, logistics, and materials management. Several of the business owners interviewed testified to the difficulty of earning a profit while wrestling with these factors. A dedicated source of guidance, with specialization in maritime businesses, would be a useful resource to assist these firms through practices like lean manufacturing principles or Six Sigma management techniques.
- **Align maritime workforce and economic development strategies.** An active state workforce development effort, Maritime Works, has important recommendations for boat and ship builders, while state and regional economic development plans also address the sector in various ways. A coordinated statewide effort, with shared public and private membership, could align the local workforce and economic plans to maximize existing strategies and contribute additional resources. The process could be started by creating an ad hoc coordinating group with membership drawn from existing efforts around the state.
- **Leverage state financing programs and assets.** Various revolving loan programs under the Division of Economic Development (DED) are already used by individuals to purchase and repair vessels. However, vessel builders themselves could take advantage of DED loan programs to meet working capital needs, a common challenge mentioned in the interviews. Other public financing vehicles could be used to finance maritime infrastructure in coastal communities, to benefit the sector.
- **Promote innovation and entrepreneurship in the maritime sector.** Vessel builders in Alaska display talent for innovation and product development, and stand to benefit from stronger ties to the state's entrepreneur community. This community includes investors, mentors, networking events and groups, and sources of technical assistance. An ocean economy-themed Design Sprint, a collaborative process to rapidly design new products, occurred in October 2017, and could serve as a pilot.
- **Identify maritime supply chain opportunities for Alaska companies.** Some vessel builders expressed interest in sourcing more of the materials and components they need from in-state businesses. With large ships being built in Ketchikan, the ability to supply components locally could be an economic development opportunity. A better understanding of supply chains would be needed to capitalize on it, however.

II. Introduction and Statement of Purpose

This study highlights the manufacturing of boats and ships as an industry in Alaska with high growth potential. It will be the first in a series of studies produced by the University of Alaska Center for Economic Development (UACED) to explore drivers of economic growth and diversification. Throughout this series, UACED will devote special attention to increasing economic development within areas of competitive advantage for the state. The overall purpose of this series of reports is to generate forward-thinking economic and business development strategies that address the unique challenges inherent in doing business in Alaska. This study was completed under the sponsorship and direction of the State of Alaska Department of Commerce, Community, and Economic Development, Division of Economic Development (DED).

In studying the boat and ship building sector, this report aims to:

- Assess the broader context for the sector in the national and global economy.
- Gain an understanding of Alaska's competitive strengths in the manufacturing of boats and ships, from the perspective of those running the businesses.
- Identify barriers to growth, and areas where different types of assistance could enable growth.
- Provide recommendations to policymakers, economic development practitioners, financiers and business owners to facilitate growth in the industry.

Bay Weld Boats



III. Alaska's Maritime Identity

From Inupiat whale hunters in *umiags* millennia ago, to Bristol Bay sailboat gillnetters in the last century, Alaska's maritime traditions run deep. The state's coastline, which roughly equals that of all other states combined, bountiful fisheries, and lack of roads demand an appreciation for the boats and ships that make life possible here. For modern industries, ocean transportation is an economical way to move goods and people—often, the only practical means to do so to island communities. For commercial fishermen, boats are as much an essential tool as the hammer is to a carpenter. In rural communities, life-sustaining harvests of fish and game often require water access. Without a statewide road or rail system, all Alaska communities depend on barges for delivery of consumer goods and food to at least some degree. Of course, waterways also provide sport fishing and recreation opportunities, so many Alaskans spend their summer weekends in boats.

Whether for income, survival, or fun, marine transportation is a key part of Alaska's economy, as well as identity. Alaska's waters produce more wild seafood than all other states combined, making it the state's largest source of private employment.¹ The state sells more fishing licenses per capita than any other state, at about six times the national average.² Prudhoe Bay crude oil and Red Dog Mine ore cannot reach national and global markets any other way.³ Goods that pass through the Port of Alaska in Anchorage reach around 85 percent of Alaskans.

Alaskans exhibit a talent for building and designing vessels, as well as using them. This skill has often been dictated by necessity, when manufactured boats have been unavailable or unsuitable to

Whether for income, survival, or fun, marine transportation is a key part of Alaska's economy

the Alaska environment. Today, vessel building in the 49th state runs the gamut from 300-foot passenger ferries constructed at a modern shipyard in Ketchikan, to small artisanal crafts built by owner-operators. Alaskans have designed vessels for various conditions and specifications such as shallow water, high speed, durability, lightweight, and many others. Transport, patrol, commercial fishing, charter, subsistence, and recreational vessels can all be built in-state, satisfying a demand for watercraft that is significant for the state's small population. It is a bright spot for a state with a small manufacturing sector.

As an industry, in-state boat and ship builders reduce dependence on vessels built elsewhere, and allow dollars to circulate within the state, creating and supporting local jobs. With an aging fleet of over 9,000 vessels greater than 28 feet, and countless numbers of smaller craft, a ready market exists—if Alaska companies can compete effectively with out of state firms to capture this share of the market.⁴ Lower-48 facilities, with a large concentration in Washington and Oregon, build a large share of the vessels that operate in Alaska. They enjoy the advantages of readily available skilled labor, low energy costs, and better access to materials and suppliers. These advantages usually outweigh the cost of transportation to Alaska.

IV. Alaska Boat and Ship Building at a Glance

Industry Defined

This study examines boat and ship building as a combined sector, but there are important differences between ship building enterprises—of which there is only one in Alaska—and smaller boat building companies. Exact definitions of “boat” and “ship” vary, but for Alaska, only Vigor Industrial in Ketchikan can claim to be a ship building operation, specializing in vessels that are often hundreds of feet in length. The shipyard is owned by the Alaska Industrial Development and Export Authority (AIDEA), a public corporation of the State of Alaska, but operated by Vigor, a private company. All other companies in this study focus on vessels roughly 40 feet and under. At times this

study will refer specifically to boat builders, which intentionally excludes the Ketchikan operation. The terms “vessel,” “craft,” and “watercraft” are used to include both boats and ships.

Service operations that repair and modify vessels, but do not manufacture them, are not a direct focus of this study. Roughly 100 businesses in Alaska provide vessel repair services, but only a third of that figure build them.⁵ Nearly all of the businesses interviewed in this study perform service work as well as building vessels, so the findings presented here are often applicable to service-only operations.



Vigor Alaska

National Trends in Boat Building

Boat building in Alaska differs notably from the national industry. The state primarily hosts small-scale custom builders, rather than large-scale industrial producers, with the exception of the Ketchikan Shipyard. Nonetheless, national trends influence Alaska boat builders' competitive environment.

The U.S. boat building industry is focused largely on the recreational segment, which makes up nearly 80 percent of industry revenues, with the commercial market (including commercial fisheries, visitor industry, and transportation) composing roughly 5.6 percent.⁶ The percentage breakdown for Alaska is unknown, but the state's large commercial fishing fleet undoubtedly constitutes a much larger share than the national average. As a consumer-focused sector, revenue growth in the U.S. boat building market is closely tied to the health of the economy as a whole. Declines in household income, like those resulting from the 2008-2009 recession, result in sagging sales. The subsequent recovery in recent years has proven a benefit to the industry nationally, and analysts expect modest growth of approximately one percent per year until 2021.⁷

...in-state builders often view their products as being so specialized for Alaska conditions that they lack direct competition.

The 2008-2009 recession had important effects on the industry in the Lower-48. For many boat building companies that suffered declining sales, consolidation became a solution to cut costs in order to stay in business.⁸ Between 2008 and 2016, the number of boat building firms decreased from 1,103 to 888.⁹ The trend of companies consolidating is expected to continue until 2021, at a yearly rate of 1.2 percent. As a way to increase profit, many larger companies decided to focus on price-leadership, leveraging scale to decrease prices to consumers. Technological advancements are being used in order to offer consumers higher quality at a lower price. Smaller companies, on the other hand, have chosen to focus on customization and niche markets to differentiate themselves.¹⁰



Solas

Alaska boat builders fall mostly into the latter category, serving customers who seek unique or specialized designs, usually built to order and not in production runs. Factory-produced boats from the Lower-48 are often cheaper than those made in-state. As the interview data showed, in-state builders often view their products as being so specialized for Alaska conditions that they lack direct competition. However, Alaska has entered its own recession as a result of low oil prices beginning in late 2014. It is possible that the softening economy will have an impact on the demand for recreational boats over the next few years, harming prospects for the state's recreational segment.¹¹

Nationally, analysts anticipate changes in consumers' preferences influencing the boat building industry.

An increased awareness regarding fuel-economy, due to fluctuations in oil and gas prices, has put a greater focus on research and development and created an increase in demand for¹²:

- Small boats less than 20 feet
- Fuel-efficient boats

Other types of boats that gained popularity during the 2008-2009 recession include pontoon boats, sail boats, and electric-powered vessels.¹³

Mackinnon Marine



National Trends in Ship Building

At the national level, the ship building industry is closely tied to the U.S. Navy's demand for military ships and vessels, which make up the majority of industry revenue. The Navy's current efforts to modernize its fleet and focus on maritime operations will impact demand for ships. Another large market for the ship building industry is the U.S. Coast Guard. Its need for patrol boats, and boats used for search and rescue, will also have a significant impact on ship demand for the next few years.¹⁴

As mentioned previously, despite national demand, there is only one major ship builder in Alaska, Vigor Industrial, which operates the Ketchikan Shipyard owned by AIDEA. Vigor produces a range of different vessels such as ferries, workboats, icebreakers, and fishing boats.¹⁵



Size of the Industry

Data regarding Alaska’s vessel building industry is inexact. The Alaska Business License database lists 53 current businesses that name boat building as their primary line of business.¹⁶ However, it is uncertain how many of these are active boat manufacturers. According to the U.S. Bureau of Labor Statistics¹⁷, as of the first quarter of 2016, there were 23 establishments within the ship and boat building industry in Alaska, which corresponds

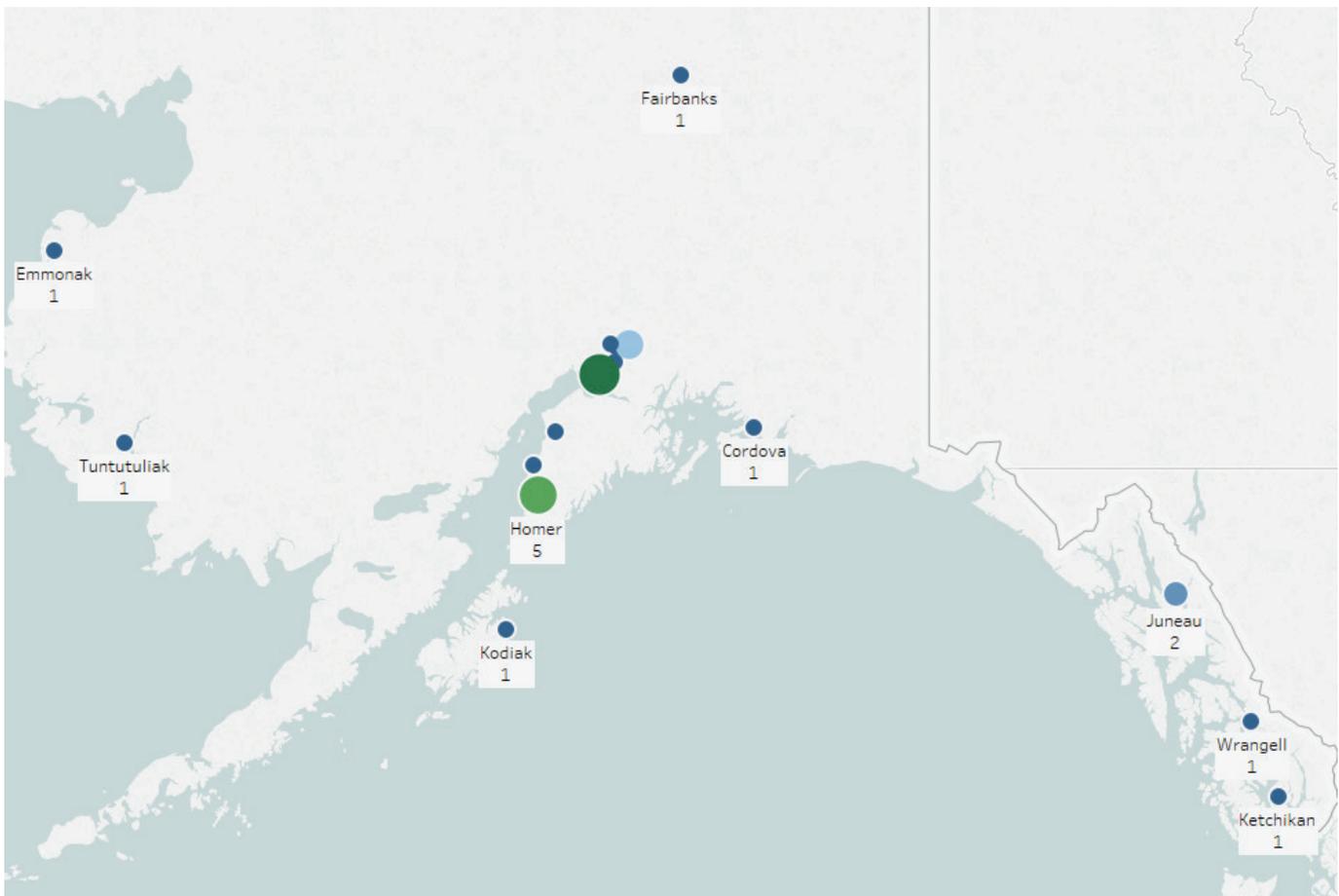
with the U.S Census Bureau’s number for 2015. This excludes non-employer firms run by an owner-operator, a category that includes several boat builders. Accounting for this, roughly 30 active boat and ship building businesses is a reasonable estimate. Various sources place the number of employees in the sector between 300 and 400, although it should be noted that this category includes repair as well as manufacturing.¹⁸

Table 1: Number of Establishments and Employees in the Ship building Industry (September 2016)

Region	Number of Companies	Number of Employees
United States	1,865	132,740
Alaska	23	371

Source: US Bureau of Labor Statistics

Figure 1: Locations of boat and ship building companies in Alaska.



Industry Revenues and Employment: Boats

The IBISWorld report on boat building states that the national revenue for the U.S. boat building industry was \$8.8 billion in 2016, and the annualized growth rate is predicted to be 1.1 percent until 2021. It is noteworthy that even as the boat building industry is rebounding nationally, revenues have not reached the high levels they were at prior to the recession.¹⁹

The boat building industry is in general, very labor intensive. Many smaller companies have chosen to focus on customization, charging a premium price to increase profit, a strategy that requires a great amount of labor. In contrast, larger boat building companies have come to focus on price leadership, consolidations, and the use of technical innovations to gain competitive advantage on the market. The trend of consolidation in the Lower-48 that started in the previous recession, which led to a decrease in the number of businesses within the boat building industry, will likely continue.²⁰ Greater consolidation in the industry may challenge Alaska boat builders, as out of state competitors leverage better technology and economies of scale.

Industry Revenues and Employment: Ships

Ship building industry revenue was \$25.5 billion in 2016. The IBISWorld ship building report predicts an annualized growth rate of 4.2 percent, which is slightly higher than for the boat building industry, due to an increase in demand for military vessels.²¹ Other factors that may have an impact on the demand and growth of the ship building industry include the need for the U.S. Navy to modernize its fleet, geopolitical factors, changing environmental regulations, and the prices of raw materials.²²

As with the boat building industry, the ship building industry is highly labor intensive. To complete an order of a large ship can require up to 1,000 workers, and specialized skills are usually required.²³ According to the statistics presented by the IBISWorld report, the employment rate is forecasted to trend steadily upward for this industry until 2021.²⁴

Table 2: Financial Benchmarks for the US Boat Building Sector in 2016

Financial Benchmarks, 2016	Boat Building Sector
Average revenue per enterprise	\$10.4 million
Profit	\$360.4 million
Profit margin (earnings before interest and taxes) of industry revenue	4.1%

Source: IBISWorld Industry Report 33661b, Boat Building in the US, www.ibisworld.com

Table 3: Financial Benchmarks for the US Ship Building Sector in 2016

Financial Benchmarks, 2016	Ship Building Sector
Average revenue per enterprise	\$42.7 million
Profit	\$2.0 billion
Profit margin (earnings before interest and taxes) of industry revenue	7.9%

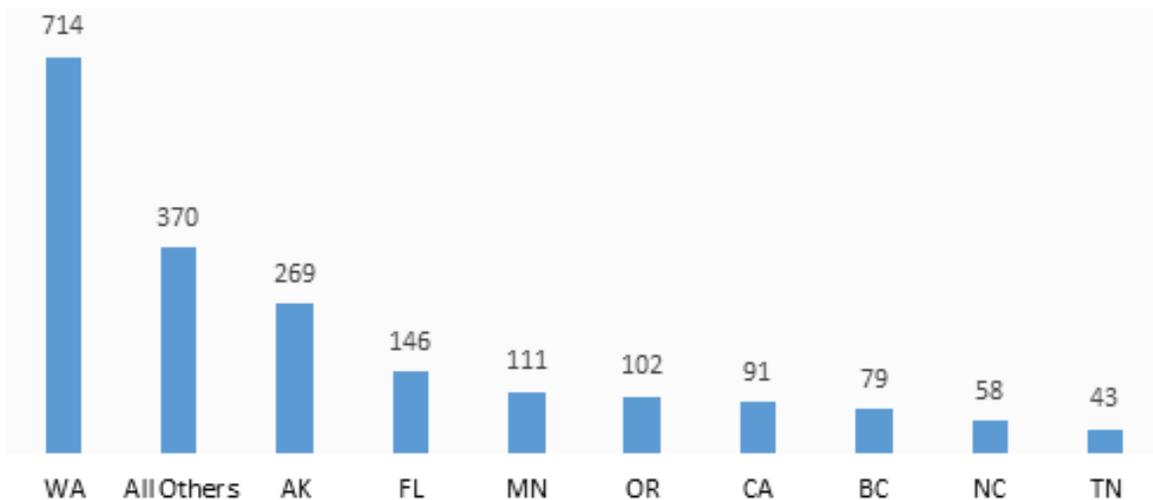
Source: IBISWorld Industry Report 33661a, Ship Building in the US, www.ibisworld.com

The Alaska-Built Fleet

It is difficult to know how many Alaska-made boats exist, or what share of the market Alaska companies have captured. However, one indicator is drawn from the Alaska Commercial Fisheries Entry Commission (CFEC). Many commercial fishing permit holders register a hull number, which indicates the manufacturer of the boat. By sorting the manufacturers by state, figure two was generated, showing that the largest share of boats with registered hull numbers are from Washington, but Alaska accounted for the second-highest total of any state.

Alaska is home to roughly 30 active boat and ship building businesses

Figure 2: Commercial Fishing Vessels in Alaska by State of Manufacture



Source: Alaska Commercial Fisheries Entry Commission

V. Results

Alaska Boat and Ship Building Companies

Interviews were conducted with 14 ship and boat building companies. The majority of the interviewees were owners of businesses located throughout the Alaska. However, one of the companies was established in Alaska but is now located out-of-state. Aside from Vigor, which has over 200 employees, the companies ranged in size from 25 employees to those with only a single owner-operator. Some companies also mentioned that they employ subcontractors as needed, or outsource manufacturing to third parties.

Just as the number of employees varies greatly between the boat building companies, so do the approximate revenues. For 2017, expected revenues span from roughly \$100,000 to \$6 million.

Vigor Industrial is a privately held company of much larger scale than the other in-state vessel builders. In 2014, its annual revenues were estimated to be \$400 to \$500 million.²⁵

A common denominator for most of the boat builders is extensive previous experience in the maritime sector, as well as a passion for building boats.

The oldest business in this study was founded in the 1970s. Three of the companies were founded in the early 1990s and three were founded between 2008 and 2011. About half of them were incorporated, registered, or re-opened in 2014 or later. Some of these newer companies are not yet manufacturing or earning revenues.



Products and Services

The boat and ship building companies produce a wide range of boats and ships for different kind of purposes, such as:

Table 4: Types of Watercraft Produced in Alaska

Type of watercraft	Number of companies producing
Custom aluminum boats	2
Fiberglass boats	2
Sport utility boat	2
Freighter canoes	1
Welded plastic tough duty boats	1
Bowpickers	1
Gillnetters	1
Set netters	1
Offshore landing crafts	1
Hovercrafts	1
River boats	1
Close to shore open-water boats	1
Patrol vessels	1
Passenger charter boats	1
Hull inflatable boats	1
Various ships	1
Commercial/utility skiffs	1

Most of the companies earn revenue from other services and products beyond manufacturing boats or ships as a way to supplement their business. However, two of the older business owners said that they used to be able to focus entirely on building boats, but that has now changed: “In 2007, we had about a four-year backlog for orders, we ran a 14 man crew, we ran two shifts, and we were turning out 18 boats over 30 feet[...] a year.” The

other interviewee said that: “Up until two years ago 100 percent [of the revenue] was from new builds, I didn’t do any repair, zero, nothing, nothing else, it was new builds, that’s all I did. I turned everything else away, and I turned away probably an average of 20-30 boats a year, too, I just couldn’t do them, there [were] too many boats to build. So, about two years ago when I saw that the fishing was getting bad, I started taking in repair.”

Other services and products offered by the participating boat building companies include:

Table 5: Services and Products Provided by the Firms Interviewed for this Project

Service	Number of Interviewed Firms Providing
Vessel repair and maintenance	5
Fabrication services	3
Welding Services	2
Building RVs	1
RV repairs	1
Boat building cost estimating software	1
Freight hauling business	1
Consulting services for safety evacuation	1
Trailers for boats	1

Services like boat repairs, fabrication, and maintenance are mentioned by some of the boat builders as being their “bread and butter.” One of the interviewees said, “this is where we actually get paid what we are worth,” essentially, they can make a profit that covers the overall costs of the business. Vigor Industrial also pointed out that repair services have higher profit margins than building vessels, and contributes to a steady workload that keeps employees busy and provides stable income.

A noteworthy trend when it comes to the boat building industry in Alaska is that a great number of the vessels are aging, with the majority being built between 1970 and 1989. According to the McDowell Group, Alaska fleet consists of a total

of 9,400 vessels over 28 feet. Of these, 7,660 are home ported in Alaska. There is also a larger number of smaller crafts, which are not included in the 9,400. Smaller vessels also account for the largest share of new vessels that have been produced in the state since 2010.²⁶ This is an indication of likely demand for vessels within Alaska, first and foremost for commercial use, within the near future.

The percentage of revenue the companies get from boat or ship building and repair varies. One of the companies focuses 100 percent on repairs. More than half of the active boat building companies said they get a part of their revenue from services such as repair, modifications, fabrication, or other products. The percentage they get from boat building ranges from 20-80 percent of the annual revenue.

Table 6: Vessel of Building Share of Revenue

Vessel Building Share of Revenue	Number of Interviewed Firms
Less than 50%	2
50%	2
50%-70%	3
70%-90%	2
90%-100% ²⁷	5

Companies also mentioned that the percent of revenue that comes from vessel building often fluctuates depending on the season. For instance, repair work tends to be concentrated in the late spring or summer for the operating season, while building vessels can be a good way to stay busy in the winter.

How They Identified Opportunities

Several of the boat builders went into business after making boats for themselves that had features such as fuel efficiency, durability, or the ability to access shallow waters to go up-river. Their boats were recognized by people around them, who started making requests and putting in orders. Other interviewees said they identified an underserved market segment for boats designed for Alaska waters and environment, including rough conditions that change quickly. One saw the necessity of having access to a boat due to the importance of waterways to move between villages in rural Alaska.

One firm mentioned identifying the needs of state, and municipal government agencies as a driver, particularly among those agencies responsible for search and rescue operations in unique environments not suitable to existing boats.

Some of the boat builders also talked about how they found a niche, such as making boats from a specific material such as tough plastic or aluminum, or a special design. One of the interviewees saw a large market in the state for the hovercraft, since no other manufacturer was yet established in Alaska.

Others had been working for, or with, another boat building company. They had been in the boat business long enough to “make a name,” and there was already a demand for their boats when they started their own business.



Customer Segments

The market segments for boat and ship building can be divided into three categories: commercial, recreational, and government. In Alaska, the commercial market is by some measures the dominating segment, when looking at the boat building industry and the ship building industry together. Sixty nine percent of Alaska’s fleet consists of commercial fishing boats; 16 percent are used within the oil and gas industry, passenger transportation, tourism, and freight transportation; and recreational boats make up 15 percent.²⁸

Many of the companies that participated in the study are building boats for both the commercial market (primarily for commercial fishermen, the visitor industry, and transportation), and the recreational market (often with a focus on fishing and hunting, including subsistence). Three of them also include government agencies, such as search and rescue, as their customers. Expanding into multiple segments has been due to changes in the market, according to some interviewees. They started making boats for commercial fishermen and then went into the recreational market as a way to broaden their customer base. One of the larger boat builders said: “I think that one of the core things of any business in Alaska is being really diverse, and it’s worked really well for us in boat

“I think that one of the core things of any business in Alaska is being really diverse...”

building too.”

However, there were three boat building companies that put almost their entire focus on making boats for either the commercial or the recreational market. Two boat builders were more specific, and said that they make boats for hunters and fishermen in rural Alaska.

The majority of the participating boat building companies have 90 percent or more of their customer base in-state. However, one of the companies has a large out-of-state market and said that many of their customers live out-of-state, but buy their boats in Alaska and fish commercially in the surrounding waters.

Two of the boats builders mentioned accessing out-of-state markets as a long-term goal, and two of the companies explicitly expressed an interest for the domestic market. The majority of Vigor Industrial’s customers are based out-of-state.

Table 7: Customer Segment Served

Customer Segment	Number of Interviewed Firms
Recreation	8
Commercial Fisheries	7
State and Municipal Government	4
Tourism or Guiding	3
Subsistence	2

Main Competitors

Surprisingly, about half of all the boat builders interviewed do not consider themselves having any major competitors. Many of them explained that they make custom boats, and do not use drawings to mass-produce a specific model. They have found a niche and provide a unique product to the market. Even though many of them cannot point out a main competitor per se, they do see the boat building industry as very competitive.

Four boats builders referred to other Alaska companies as main competitors, showing similar areas of specialty. Two of the interviewees pointed to Pacific Northwest companies as their main competitors.

Companies mentioned included:

- Hard Drive Marine, Washington
- Reutovs, Oregon
- Cuijack, Washington
- Armstrong Marine, Washington
- Kvichak Marine, Washington

Two other companies said their main competitors are on an international level:

- BRP Inc., Canada
- Griffon Hoverwork, UK
- Airlift Hovercrafts, Australia

These statements reinforce the perspective that Alaska's specialty or artisanal boat builders are not direct competitors to the production vessels built in large-scale factories. They target a higher-end customer who has likely ruled out such a vessel in favor of one that is more customized, and/or uniquely suited to Alaskan operating conditions.

Financial Performance

About half of all the boat builders mentioned the volatility of the industry. These companies have witnessed how demand has fluctuated due to downturns within the fishing industry and oil industry, as well as the overall state of the economy, both nationally and in Alaska. One of the interviewees described how the national economic downturn really hit the boat builders in Alaska hard in 2009, "that is when things got bad, just flat out bad." During this time, he said, he saw several of the boat building companies around him go out of business. The national economic recession, which did not have strong impacts on most of Alaska's employers, seems to have had a severe impact in this case.

Several of the interviewees perceived that the current statewide recession, resulting from low oil prices, has hurt their businesses. One of the boat builders said that in these times, "even if you are a charter fisherman you are not gonna go looking at a \$150,000 a \$200,000 boat, or a loan for a boat [...] that is kind of a luxury." Furthermore, he said, "people just are not buying \$150,000 boats anymore, they're just not."

For this company, and other companies, this has led to a change in their business model, which is transitioning from building larger ocean vessels to focusing on smaller boats, which are affordable to a broader range of customers. According to the interviewee, this transition has been fairly successful. Smaller projects contribute to a faster production and sales, and the smaller dollar amounts involved lead to shorter billing cycles. Another company stated that when building large boats, the projects take too long and run the risk of cost overruns, causing builders to lose money.

One boat builder attributed their declining revenues to two factors: the weak economy, and cash flow challenges within the fishing industry for more than the last two years. “When there is not a lot of oil money, and then people are getting laid off on the Slope [...] those are a lot of big spenders, there is a lot of people that buy a lot of pleasure boats and stuff, and even though I don’t do a lot of pleasure boats it all comes back around I mean I do the repair side, etc. Also I do stuff for the oil companies, and oil response companies, so that affects me also, so on the economy end, people that have the money tend to hold on to it.” What is interesting with the fishing industry, he said, is

“when fishing was bad, even the guys that did great tend to hold on to their money, you would think they would still buy boats but they follow suit.”

Furthermore, another trend some of these boat builders observed is that demand for repairs and service appears to increase in comparison to new builds when the economy is down. In one boat builder’s experience: “... when the economy is down, people tend to buy less brand new and fix their olds, so the repairs go up, but I just don’t do a lot of repairs, I don’t like doing a lot of repairs.” The interviewee said that he will do some, yet “it depends on how hungry I am.”



Trends: Approximate Annual Revenue

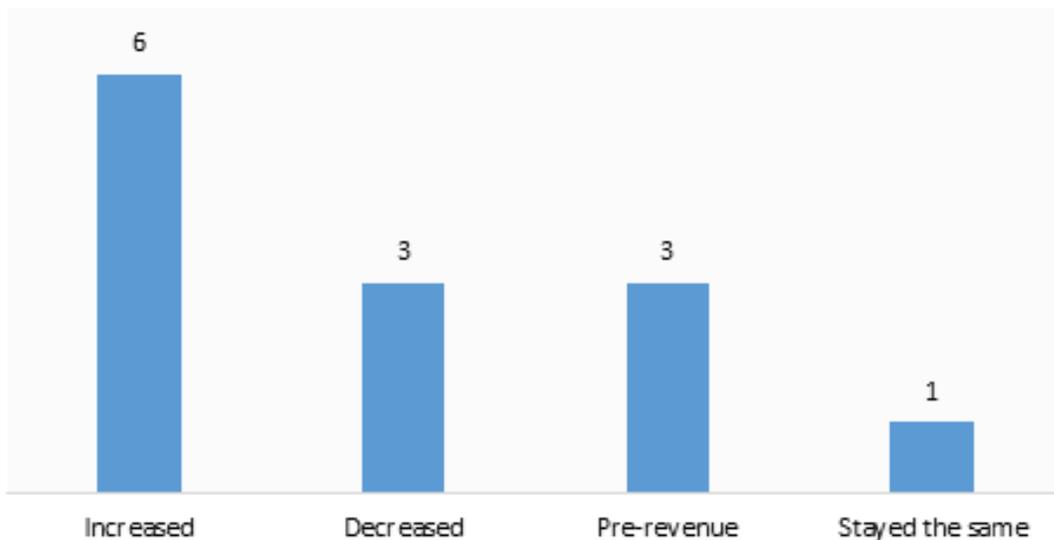
Among the companies that had revenue and opted to answer, the majority said that their annual revenue in the last year had increased. Although concerned about the economy, revenue growth has still been positive for most of the companies interviewed.

Table 8: Gross Revenue

Gross Revenue	Number of Companies
> \$100,000	0
\$100,001-200,000	2
\$200,001-300,000	0
\$300,001-400,000	1
\$400,001-500,000	0
< \$500,001	2
Opt to skip	4
No sales yet/Not manufacturing yet	3

Note: Two companies are not included in this table.

Figure 3: Approximate Annual Revenue



Profit Margins

Boat builders often feel squeezed by low profit margins and believe that their services are undervalued. One interviewee said, “the profit margin is so small that if you mess up anywhere it is gone.” Another interviewee shed more light on this, saying: “It is hard to know if we will make any money, because with boat building [price] doesn’t really matter because it is all based on, you know you can put all your components together and you can get a price for the materials and everything is going in it, that is a number, but the other number comes for the skill of your guys, and if your guys are exceptionally good you can give an exceptionally good price on the boat but, if for some reason one of [...] your skilled guys get hurt [...] you just can’t predict that.”

Growth Capabilities and Current Limitations

UACED asked all companies about their capacity to take on additional work if demand increased. Part of the motivation behind this question was exploring whether public incentive programs tied to state loan programs or procurement policies, would be effective in growing the sector. McDowell Group recommended in 2014 that state commercial fisheries loans, used to build or service vessels, could offer a higher amount if the work is performed in Alaska.²⁹ For this to be an effective policy with respect to building vessels, Alaska companies would need adequate facilities, equipment, and access to labor.

About half of all the participating companies said that they have the capacity to grow if they experienced an increase in demand. The majority of the boat builders said they would like to

grow, but that they are experiencing, or have experienced, limitations preventing growth. Some of the hindering factors mentioned were labor availability, financing, risk, and space limitations, which will be further discussed in the next section.

Some of the boat builders are lifestyle entrepreneurs not seeking to scale their businesses. Two of the interviewees expressed that they do not want to grow, because it is not a part of their goals. Two others expressed an ambivalence towards growing, and that they are not sure if they want to grow. One of the interviewees said that he would like to grow if he could find someone who could do his current job of managing the business, enabling him to spend more time in the shop building boats. Another interviewee who is seeking growth said that he is not sure if he would like to grow his business in Alaska due to previous experiences. He also said that in order for him to scale up, he wants to see an increase in sales that lasts for at least two years. In his words, “I don’t know if I would scale up in Alaska at this point, honestly, I’ve done it [...] I fought the battles, been there done that, if my boats were in demand in states other than Alaska I would probably move my business, just for the sheer fact of costs of doing business.”

However, many companies said that they continuously scale up and down due to seasonal peaks. In the winter they have fewer employees, and in the spring and summer time, when the demand for boats increases, they hire more people. For this reason alone, they have extra capacity in terms of space and equipment that could be more fully utilized during the off-season.

Barriers to Growth

Regardless of whether the companies said they currently had the capacity to scale up or not, they could all identify potential barriers. The barriers to growth identified were:

Table 9: Barriers to Growth

Barriers to Growth	Number of Companies
Labor--access to skilled, reliable workers	12
Financing--access to the capital needed, including work capital	6
Facilities--the need for larger space	3
Cost of doing business in Alaska including: rent, workman's comp, and freight costs	2
Geographic location (distance from suppliers and support services)	2
Risky investments-have to pre-commit and pre-buy materials in the winter/fall	1
Dealer/Distribution	1
Small market (recreational)	1

Note: Two companies are not included in this table.

Two interviewees testified to the cost of doing business in Alaska as one of the greatest barriers to success, but others mentioned it indirectly. The cost of skilled labor was by far the most common factor identified. High workers' compensation rates in the state of Alaska, along with high rents were two other factors they pointed out, which consequently lead to smaller profit margins.

High costs are passed on to customers, but not all builders saw this as a disadvantage to Alaska companies. As one noted about higher prices: "the market bears that here, has been my experience, as long as you are building an Alaska quality product, Alaskans are smart buyers, they know when something is well built and when it is not, that's been my experience, I think they are more discerning than Lower-48 buyers [...] they are looking for quality stuff that is going to last, because Alaska is really hard on stuff, the environment, so they are willing to pay 5-10 percent more for something that is really well built, that is what we've experienced. We just landed a

contract recently where we were competing with a Lower-48 company and we were five percent higher, and the customer chose us, he's an Alaskan business and he values doing business in Alaska, we see that as well, it is high value to other businesses to keep their money local so we find that the market is bearing it, but we constantly have to be on our toes, watching every penny we can, to remain competitive."

Another boat builder, who began his company in Alaska, but since has moved down to the Lower-48, talked about other advantages enjoyed by out of state companies, such as proximity to material cutting and other processing services, and not waiting weeks for deliveries. These conveniences transfer to the overall ease of doing business, which makes it hard for Alaskan companies to compete with businesses in this the Lower-48. He also talked about opportunities for Alaskan companies on the Lower-48 market, saying, "I can think of several Alaskan companies that have products that would clearly do well down here [in the Lower-48], it is

a little bit more competitive market down here but they could mix it up and do it, but would be a minority that really would.” He also pointed out that the northern part of Washington is a manufacturing hub for Alaska, with many of the boats produced in this region shipped north. The sole ship builder in Alaska, Vigor, also emphasized distance from suppliers and subcontractors as challenges to doing business in the state.

Issues with financing were cited by the majority of the vessel builders in this study as a significant barrier to growth. Four of the boat builders said that they do not have the working capital it takes to meet upfront costs before receiving final payment from customers. Two boat builders mentioned how government contracts can be a way to scale up. However, this requires a large amount of capital upfront. One of the interviewees talked about how being undercapitalized is a significant barrier. He talked about how boat building companies sometimes gets paid 30 days after delivery, and how this is a challenge since boat builders are producing a high value item. He suggested that some kind of bridge financing is needed at a reasonable cost, and if lenders viewed contracts with government agencies as a security for payment, this might encourage more boat builders to pursue them.

“...Alaskans are smart buyers, they know when something is well built and when it is not...”

Dealers and distributors were brought up as well as a barrier to expansion. One interviewee said that dealers throughout the Northwest region are not interested in carrying any new lines of boats, as they have too many already. This dynamic forces Alaska companies to develop their own sales channels, and market directly to customers without the benefit of a dealer network.

One experienced manager pointed to boat builders themselves as a barrier: “most small businesses owners are tradesmen first and then they’re business owners, and there becomes a conflict there, because not all tradesmen make good business owners.” Many of the owners of these companies expressed a passion for boat building, and a desire to stay small and be directly involved in the manufacturing process, more so than administering a business. As another interviewee commented: “To have growth potential you kind of have to move beyond that, and take as much satisfaction in growing that skill in somebody else as mastering it yourself.”



Workforce

Finding and retaining employees with cross-cutting skills and strong work ethics was mentioned by many of the interviewees as an issue. A boat builder has to be, as one of the interviewees said, a “jack-of-all-trades” and often do everything from welding to carpentry, mechanical and electrical work. It is also noteworthy that only one of the interviewees said that they had a workforce, with the necessary skills, readily available. A second interviewee did not identify labor as a problem,

however, this company is not manufacturing yet. One of the boat builders explicitly pointed out the problem with finding the skills needed in a small town, an issue highlighted in the Alaska Maritime Workforce Development Plan (AMWDP). The report stresses the issue of an aging maritime workforce, and the need to create a workforce readiness plan in order to meet the needs identified by employers within the maritime sector, such as boat builders.³⁰ The skills that the participating boat building companies identified as most in demand were:

Table 10: Skills in Demand for Boat and Ship Building

Skill in demand:	Number of companies identifying the skill in demand
Welding (aluminum in particular)	8
Fabrication skills	6
Basic technical skills/general labor skills	4
Computer literate, software skills, such as CAD-prints/3D-prints	3
Rigging skills	2
Work ethic, reliability, and hard workers	2
Designing skills/creative thinking/an ability to “think outside the box”	2
Carpentry	2
Fitting skills	1
Mechanical skills (knowledge about propulsion system, and different engines)	1
Upholstery	1
Electrical skills	1
Mechanical engineers	1
Electrical engineers	1
Estimating time and costs for projects	1

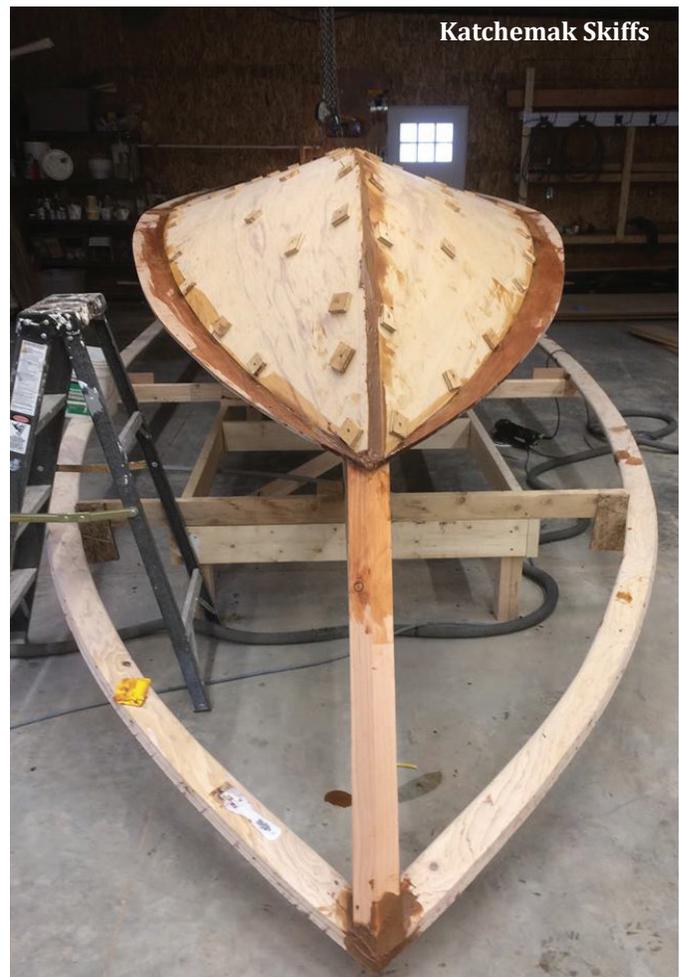
The majority of the companies said they provide on-the-job-training, as long as the employees have a good work ethic and, preferably, some basic welding skills.

Two of the interviewees stressed the importance of computer skills among the vocational workers, and an ability to work with computer-aided design (CAD) and 3D printing to manufacture customized components. One of the interviewees said, “the technology piece is as important as the skill piece” and “you can’t be successful or really competitive in a workplace without technology anymore, it’s just the way it is.”

Not all commentary on the maritime workforce was negative. Although the Vigor Industrial representative saw labor availability as a barrier, noting how it is rare that the employees have the technical skills required before being hired, he still noted the quality of the workers that the company employs: “This is a unique yard and has a very high ratio of self-performance, with a relatively small percent of contract work, and it is not necessary healthy, so the quality of workers that we get are high in Alaska because they come with a built-in work ethic, and most importantly, innovation is natural to Alaskans. They have to be innovative to be competitive in Alaska, and often you have to be innovative just to save your bacon.” Furthermore, he talked about how shipbuilders in the Lower-48 have access to a large subcontractor network, which they can utilize for specialty needs like CAD design or electrical systems.

One of the interviewees spoke about the advantages the larger boat building companies have, how attracting and retaining staff is greatly affected by the benefits employers can offer to keep their employees.

“...the quality of workers that we get are high in Alaska because they come with a built-in work ethic, and most importantly, innovation is natural to Alaskans. They have to be innovative to be competitive in Alaska, and often you have to be innovative just to save your bacon.”



Suggestions for Improvement

Both the economic development community and state policymakers view the maritime industrial sector as an area of economic opportunity. To gain insights into potential strategies, UACED asked all subjects: “If the State of Alaska or the University system could do one thing that would improve conditions in your industry, what would it be?”

Many expressed concern about the weakness of the state’s economy overall, and the lack of certainty about a state budget. A few of the interviewees voiced a need to diversify Alaska’s economy and “promote non-oil Alaskan businesses more.” Some of the specific suggestions for improving the operating environment for the sector were related to marketing, government purchasing, taxes, logistics, and workforce.

Marketing

Many of the smaller companies rely on word of mouth for their business, and one owner voiced his desire for marketing assistance to promote Alaskan-built vessels, as well as provide mentorship on marketing in general.

Government Purchasing

One builder pointed out that state and federal agencies would be well-served by purchasing Alaska-made boats for operating in the state, a move that would also stimulate the industry.

Taxes

The state budget crisis led one owner to express concern about whether or not he should budget for income taxes. He suggested that providing an estimate to business owners on potential taxes would be helpful. The same interviewee also stated that taxing inventory (as part of property taxes) was problematic for boat builders who must carry expensive supplies for building vessels. Inventory taxes at the municipal level, mean that boat builders are more hesitant to purchase a lot of things in bulk, which would increase cost savings, in case they will get taxed on that inventory at the end of the year.

Logistics

One suggestion called for a policy to subsidize the cost of shipping manufactured products (including boats) to out of state buyers. The aim would be to neutralize the cost “penalty” paid by Alaska companies that make their products less competitive in the Lower-48, due to high shipping costs from the state.

Workforce

Two companies mentioned the cost of Workers’ Compensation insurance as an area needing state attention. The insurance is expensive, and in Alaska it is a requirement for businesses in certain industries that employ one or more workers, whereas in many other states it applies only to companies with five or more employees.

Several others saw training and workforce development as major areas where the state and university system could help the industry. Five of the interviewees mentioned this area, with three stating that vocational-technical education should be improved at the high school level. Another said that the University of Alaska should broaden some of its vocation programs to include the ability to read plans, fabricate, and repair. One large employer in the industry said the university could be a partner in leading public outreach forums.

The Economy

Some of the companies felt that state policy should be directed at other sections of the economy rather than specifically their industry. One spoke of the need to open the Arctic National Wildlife Refuge to oil and gas exploration to improve the flow of oil down the Trans-Alaska Pipeline System, and another said the state needed to focus outside of the oil and gas sector for future growth. Another said the seafood industry was paramount for vessel builders.

VI. Maritime Economic Development Strategies

As the table below illustrates, numerous regions of the state (and the state as a whole) have articulated economic development strategies related to the maritime sector in general, and often vessel building specifically. The US Economic Development Administration, which funds planning, technical assistance, and infrastructure related to economic

development, usually requires a Comprehensive Economic Development Strategy (CEDs). Most regions of Alaska have an active CEDs document, which sets a 5-year vision and plan for economic development. In 2017, a statewide CEDs was also completed. An overview of vessel building and maritime economic development strategies in these plans is shown below.

Comprehensive Economic Development Strategies (CEDs)

Region	Maritime Goals/Objectives
Statewide ³¹	<p>Develop opportunities within the Alaska Maritime Sector, in all aspects:</p> <ul style="list-style-type: none"> • Capture the opportunities for Alaska shipyards, as the Alaskan fleet is aging and the demand for restoration and new builds increase (Measurement: increase the number commercial vessels built in Alaska by 20%). • Implementation of the Alaska Maritime Workforce Development Plan, as a way to continue to develop the maritime workforce. (Measurement: increase employment within the maritime industry by 10%) • Use regional establishments to a greater extent when repair and maintenance is needed on the local fleet. • Identify opportunities that take advantage of increasing traffic through the Northwest Passage, and increased resource development for the benefit of the maritime sector.
Kenai Peninsula ³²	<ul style="list-style-type: none"> • Coordinate economic development activities with associations within the fishing industry (amongst others), and the chambers of commerce. • Pursue infrastructure development projects (for example, harbors and roads) that will improve efficiencies for the fishing and maritime industries. • Facilitate cooperation between major employers and vocational-technical programs, such as AVTEC, to improve the job-readiness of the region's workforce.
Southwest Alaska ³³	<p>Development of Fisheries:</p> <ul style="list-style-type: none"> • Promote the fisheries in Southwest Alaska that contribute a sustainable income base to the communities, residents, and businesses in the region. • Investigate mariculture in Alaska by continuing to work with Alaska Fisheries Development Foundation and other partners.

CEDS continued...

Region	Maritime Goals/Objectives
Southeast Alaska ³⁴	<p>Priority objective:</p> <ul style="list-style-type: none"> • Implement the Maritime Workforce Development Plan to meet current and future skills needs within the Maritime Industry Support Sector. <p>Other objectives:</p> <ul style="list-style-type: none"> • Continue to grow the maritime sector and thereby increase the number of employment opportunities. • Increase the access to capital for the maritime industrial support sector (especially for fishermen, to service and finance their aging vessels). • Expand and invest in new marine industry support infrastructure by supporting capital investments to enable work on modern vessels. • Increase regional vessel repair and maintenance. • Harbor Improvements.
Prince William Sound ³⁵	<ul style="list-style-type: none"> • Increase employment within the maritime sector by 1-2%. • Investigate the maritime support sector in the region. • Develop and promote an online marine services directory.
Yukon-Kuskokwim Delta ³⁶	<ul style="list-style-type: none"> • Promote and expand boat manufacturing in the region. • Improve salmon management, data collection, and communication between agencies. Develop inter-tribal Fisheries Commissions for the Yukon and Kuskokwim Rivers. • Create micro-lending opportunities for support start-ups, entrepreneurs, and commercial fishermen. • Explore ways to create direct catcher-seller agreements to help commercial fishers export their products.
Bering Straits ³⁷	<ul style="list-style-type: none"> • Investigate ways to explore natural resources in an environmentally responsible manner. One part of this is to examine the feasibility of a fish hatchery in Norton Sound. • Create a local workforce to take advantage of maritime trades and traffic through the region.

These plans testify to wide ranging interest in developing the maritime sector, and the addition of the Statewide CEDS, titled Northern Opportunity: Alaska’s Economic Strategy, offers a degree of coordination. Two other initiatives are also relevant to boat and ship building, as described below.

At present, there is little over-arching coordination among these plans that connect workforce development to economic development and innovation strategies at the statewide level. This will be further addressed in the recommendation section.

Other Maritime Development Plans

Initiative	Maritime Goals/Objectives
Alaska Ocean Cluster Initiative	<ul style="list-style-type: none"> • Developing a statewide network spanning all ocean-related industries: seafood, transportation, maritime services, oil and gas, and others. • Emphasis on innovation, entrepreneurship, and R&D. • Create opportunities for Alaska entrepreneurs through innovation sprints and an ocean economy-focused business incubator
Maritime Works	Implementing the 2014 Alaska Maritime Workforce Development Plan to: <ul style="list-style-type: none"> • Increase employment in maritime occupations • Improve quality of the workforce to assist growth of the sector • Promote the sector as a career pathway for Alaskans



VII. Conclusions

Do Alaska vessel builders have capacity to handle increased demand?

There are at least five operations in Alaska that can build commercial fishing vessels over 28 feet, like bowpickers, seiners, and gillnetters. These companies said they could in fact scale-up if they saw an increased number of buyers. Others are looking for more consistent demand, because growing entails taking a lot of risk. Because of seasonal spikes in demand, they already scale operations up and down seasonally. The major barriers to expansion are workforce availability, capital constraints, and in some cases a limited desire for growth.

Is building vessels a viable business model alone, or in combination with repair and services?

Nearly all of the firms interviewed in this study earn revenues from a mix of vessel building and repair, fabrication, or other services and products. The skills necessary to build a boat or ship, such as welding, working with fiberglass and resin, and installation of mechanical systems are similar for building vessels as well as servicing them. Profit margins are usually higher with repair and service work, and the risk of cost overruns is lower. Vessels tend to be durable items with useful lifespans of several decades, often needing annual maintenance. This translates into a larger market for services than for new builds. On the other hand, demand for service and repairs is seasonal, and building vessels in the off-season is an effective way to maintain year-round employment.

What constraints do Alaska's boat and ship builders face?

Workforce

Workforce shortages are first and foremost among identified challenges. Many of these companies are located in small coastal communities with a small labor pool, and require specialized skills. Welding, of aluminum specifically, was the most commonly mentioned skill set among those interviewed, but several pointed out that good welding skills alone are not sufficient. Workers need to be able to think creatively and handle a broad range of tasks like rigging, fabrication, and interpreting plans. Some builders are happy to train workers in boat building if they have a good work ethic and general labor and basic trade skills, but even basic work habits are often lacking.

Capital

About one-third of the interviewees pointed to access to capital as a barrier. Generally, these comments centered on working capital or financing fixed assets. Building a vessel requires high upfront costs in terms of materials and final payment from the customer does not come until the product is complete. Bridging this gap between payables and receivables is a critical challenge for these companies. Given the low margins involved, the builders often cannot afford high interest rates from commercial banks. At least one company manages this issue by maintaining large cash reserves.

Logistics

Combined with workforce, movement of raw materials and finished products is a major contributor to a high cost of business. Most of these companies serve the in-state market, but even delivery within Alaska can be expensive, the farther away from Anchorage, the more expensive the shipping gets. Raw materials like wood and aluminum must be imported from out-of-state at high cost as well.

VIII. Recommendations

Marketing

While many of the boat builders have established reputations, there is no unified Alaska brand for vessels built in-state. Moreover, many of the companies identified in the study lack even a basic website. Given that so many of companies design their products specifically for Alaskan operating conditions, a shared brand to raise the profile of the industry could plausibly increase sales. Only two boat builders are Made in Alaska permit holders, a well-regarded Division of Economic Development program to promote manufacturing in the state. Most of the companies said they had capacity to serve more customers than they currently do, and some specifically cited marketing and sales growth as challenges. This was particularly true of the startup companies.

One potential strategy is a shared marketing effort to increase the awareness of Alaska built vessels as an option. Maine offers a model in the form of an organization called Maine Built Boats, a membership-based nonprofit association that promotes the industry. As with Alaska, Maine has deep maritime roots and a longstanding culture of artisanal and industrial vessel building. Maine Built Boats publishes an online searchable directory of member businesses, as well as a printed Guide to Buying and Servicing a Boat in Maine, updated annually. Customers can also use a custom search tool on the website to specify the type of boat they want (by size, construction material, and other parameters) to obtain a list of builders they can contact. The organization provides news updates related to the industry, and hosts an annual conference and other events. Maine Built Boats promotes both the building and servicing of vessels in Maine.

While Alaska has a smaller boat and ship building industry than Maine, a cross-promotional effort is a viable option. As with Maine Built Boats, a marketing entity could provide a directory of builders and maritime service operations and feature profiles and contact information for individual companies. This could be done under the banner of an intentional Alaska maritime brand that emphasizes the companies' strengths in customization, durability, and adaptation to Alaskan waters.

Technical Assistance

Since the growth of the maritime sector in general, including service as well as manufacturing, is a statewide priority, a dedicated source of technical assistance to owners and managers would be a valuable offering. Programs like the Alaska Small Business Development Center are available to help, but industrial and manufacturing businesses often have specialized needs that go beyond generalist assistance. Interviewees frequently pointed to the difficulty of training employees on specific practices, managing costs, and coordinating logistics for supplies of raw materials. Methodologies like lean manufacturing principles and Six Sigma management techniques could be valuable to these companies and could help them retain profitability and utilize resources and staff more efficiently.

The Manufacture Alaska Extension Partnership (MAKE Partnership) has the potential to offer this type of service. However, boat building companies are widely dispersed throughout the state, and the relatively small number of them makes it difficult to focus solely on their needs. The program is currently operating on a small budget and focuses on a variety of manufacturers. Although it may expand in the future, this leaves a gap in the marketplace to assist both manufacturing and service operations in the maritime realm (rather than only manufacturers).

Alignment of Workforce and Economic Development Initiatives

As noted earlier in this study, a number of regional and statewide initiatives focus on growing the maritime sector. These include comprehensive economic development strategies, Maritime Works, and the Alaska Ocean Cluster Initiative. Each has a defined focus, but a holistic vision and coordination mechanism is missing. While maritime assets are spread over a wide expanse from Southeast to the Aleutians and into the Arctic, public and private resources for investment are finite. A true statewide effort spanning workforce and economic development could minimize duplication of effort and offer the private sector a single point of contact. It could also allow the sector to speak with a unified voice on matters of public policy and economic development programming.

At the most basic level, this could be initiated through the formation of an ad-hoc working group made up of industry leaders and representatives of the existing maritime-related efforts. The group could begin by opening channels of communication to exchange knowledge and best practices, perhaps through a summit attended by key stakeholders. If an appetite exists, a formal entity could be

established, such as a nonprofit organization or a program housed within an existing organization with dedicated staffing. Once established, such a group could contribute to the sector by:

- Issuing policy statements and white papers to advocate for legislation to benefit vessel builders and the maritime sector in general.
- Developing an in-depth statewide plan to prioritize investments in infrastructure and capacity building (such as technical assistance). This would be distinct from existing plans by focusing in-depth on the maritime sector at the statewide level on both economic development and workforce.
- Providing a forum to share information across the state about current maritime projects and best practices.
- Host shared marketing efforts, such as that described above for Alaska vessel builders and service operations.
- Obtain greater buy-in from the private sector by providing a point of access. This is especially important for small operations like several interviewed for this study, who have limited time to engage in sector-wide growth strategies.



Financing

There are multiple aspects of financing for vessel builders that deserve attention. First, several interview subjects mentioned the difficulty of managing cash flow when they must purchase raw materials prior to receiving full payment from a customer. These businesses may have difficulty obtaining a bank loan, but could potentially receive funding from one of the existing state loan programs. The Division of Economic Development, for instance, has a microloan program that can offer loans of \$35,000 (\$70,000 for more than one individual) for almost any legitimate business purpose. The amounts available are often lower than traditional banks can offer, but large enough to provide meaningful working capital. Spreading awareness of this and similar programs could be a first step to bridging the financing gap identified in this study.

Other state loan programs finance the purchasing upgrading of commercial fishing vessels, among other related uses. To incentivize growth in the maritime sector, the commercial fishing loan programs could be modified to favor in-state builders and service providers. This could be done by raising the cap on loans used to upgrade or purchase a vessel built or serviced in Alaska rather than out of state, an idea proposed by the McDowell Group in their 2014 report. Infrastructure financing, to build covered

workspaces, jetties, hoists, and other assets are another consideration. As state capital budgets have been sharply reduced in recent years, coastal communities will need to access a broader range of financing tools like bonds and public-private partnerships. Local governments in the state have used the Alaska Municipal Bond Bank for marine infrastructure like harbor upgrades, which could expand capabilities for vessel builders.

AIDEA, the state's development finance authority and owner of the Ketchikan Shipyard, which is operated by Vigor, offers a number of financing tools to support vessel builders and the maritime sector. AIDEA focuses on enterprise infrastructure, or the physical infrastructure necessary for a particular industrial or commercial development. This is in contrast to infrastructure that serves the general public (such as general purpose roads). AIDEA can co-invest with commercial lenders to offer more favorable terms, issue bonds, or make direct equity investments in a project alongside private partners. In addition to the Ketchikan Shipyard, the agency has invested in other maritime infrastructure such as a \$20 million dock upgrade at Icy Strait Point.

While DED loan programs, the Municipal Bond Bank, and AIDEA are not new to the maritime sector, they constitute offerings that could be more fully utilized in a climate of diminishing public funds.



Solas

Technological Innovation

This study uncovered surprising innovations and new uses of technology being applied to the ancient craft of vessel building. Use of thermoplastics, unconventional hull designs, electric propulsion, additive manufacturing, and other practices testify to innovative thinking. The Alaska Ocean Cluster Initiative, launched as this study was being conducted, plans to cultivate entrepreneurship and R&D related to fisheries, ocean products, vessels, renewable energy, and other ocean-related realms. Given the importance of the ocean to the state's economy, maritime technologies may be an area of competitive advantage for Alaska, in which technologies with global importance can be developed and tested. One way to move boat and ship-related technology forward is to facilitate stronger connections with the entrepreneurial community. Alaska's startup

ecosystem has matured in recent years and now includes a startup accelerator, angel investors, pitch events like One Million Cups, and Startup Week/Weekend. Bringing those with vessel design and building experience into this scene and allowing new ideas to germinate and result in enterprises and products. In the fall of 2017, this idea was being put into practice with the launching of the Ocean Technology Innovation Sprint (OTIS). OTIS is modeled on the Google Design Sprint method to rapidly create and validate new products or innovations. This type of framework allows small teams of technical or entrepreneurial individuals to design and prototype a new product over a structured five-day period. The Alaska Ocean Cluster Initiative is also pursuing an incubator, which could further advance ocean-related innovations.

Class 5 Boatworks



IX. Endnotes

- ¹ Note: For example, in 2015 about 2.7 million pounds of seafood was landed in Alaska ports, versus 4.4 million for the US as a whole (National Marine Fisheries Service).
- ² Source: US Fish and Wildlife Service, National Fishing License Data, 2016.
- ³ Source: “Goods for Alaska, Port in Anchorage” Municipality of Anchorage, 2016.
- ⁴ McDowell Group. (September, 2014). Trends and Opportunities in the Alaska Maritime Industrial Support Sector, <https://www.commerce.alaska.gov/web/Portals/6/pub/Trends%20and%20Opportunities%20in%20the%20Alaska%20Maritime%20Industrial%20Support%20Sector.pdf>
- ⁵ McDowell Group. (September, 2014). Trends and Opportunities in the Alaska Maritime Industrial Support Sector, <https://www.commerce.alaska.gov/web/Portals/6/pub/Trends%20and%20Opportunities%20in%20the%20Alaska%20Maritime%20Industrial%20Support%20Sector.pdf>, p. 3.
- ⁶ Source: Sayler, Brian. (October 2016). IBISWorld Industry Report 33661b, Boat Building in the US, www.ibisworld.com, p. 16.
- ⁷ Source: Ibid. p. 4.
- ⁸ Source: Ibid. p. 4.
- ⁹ Source: Ibid. p. 33.
- ¹⁰ Source: Ibid. p. 8.
- ¹¹ Source: Ibid. p.6
- ¹² Source: Ibid. p. 7-9.
- ¹³ Source: Ibid. p. 7-9.
- ¹⁴ Source: Soshkin, Maksim. (June, 2016). IBISWorld Industry Report 33661a, Ship building in the U.S, www.ibisworld.com, p. 5-7, 10, 17-18.
- ¹⁵ Source: <http://vigor.net/facilities/ketchikan>
- ¹⁶ Source: <https://www.commerce.alaska.gov/cbp/main/search/businesses>.
- ¹⁷ Source: The Bureau of Labor Statistics, <https://www.bls.gov/>
- ¹⁸ Source: The U.S Census Bureau, 2015 Annual Survey of Manufacturers, 2015 County Business Patterns, <https://www.census.gov/data/tables/2015/econ/asm/2015-asm.html>
- ¹⁹ Source: Sayler, Brian. (October 2016). IBISWorld Industry Report 33661b, Boat Building in the US, www.ibisworld.com, p. 3-4.
- ²⁰ Source: Ibid. p. 8.
- ²¹ Source: Soshkin, Maksim. (June, 2016). IBISWorld Industry Report 33661a, Ship building in the U.S, www.ibisworld.com, p. 3-5.
- ²² Source: Ibid. p. 13-15.
- ²³ Source: Ibid. p. 35-36.
- ²⁴ Source: Ibid. p. 40.

²⁵ “Shipbuilders Vigor and Oregon Iron Works agree to merge.” <https://www.seattletimes.com/business/shipbuilders-vigor-and-oregon-iron-works-agree-to-merge/>

²⁶ McDowell Group. (September, 2014). Trends and Opportunities in the Alaska Maritime Industrial Support Sector, <https://www.commerce.alaska.gov/web/Portals/6/pub/Trends%20and%20Opportunities%20in%20the%20Alaska%20Maritime%20Industrial%20Support%20Sector.pdf>, p. 1.

²⁷ Note: Includes pre-revenue companies expecting to earn all revenues from building vessels.

²⁸ McDowell Group. (September, 2014). Trends and Opportunities in the Alaska Maritime Industrial Support Sector, <https://www.commerce.alaska.gov/web/Portals/6/pub/Trends%20and%20Opportunities%20in%20the%20Alaska%20Maritime%20Industrial%20Support%20Sector.pdf>, p. 1.

²⁹ Trends and Opportunities in the Alaska Maritime Industrial Support Sector, pp. 8.

³⁰ Source: Alaska Maritime Workforce Development Plan (May, 2014), http://www.alaska.edu/files/fsmi/AK-Maritime-Workforce-Dev-Plan_High-Res_5-22-14.pdf

³¹ Northern Opportunity: Alaska’s Economic Strategy: <https://northernopportunity.com/wp-content/uploads/2017/05/DRAFT-Goals-and-Action-Items.pdf>

³² Kenai Peninsula CEDS: www.uaa.alaska.edu/academics/business-enterprise-institute/center-for-economic-development/reports/kenai_peninsula_borough_ceds_072216.pdf

³³ Southwest Alaska CEDS: http://www.swamc.org/files/SWAMC_CEDS__FFY16_Update.pdf

³⁴ Southeast Alaska 2020 Economic Plan: <http://www.seconference.org/strategy>

³⁵ Economic Growth for the Prince William Sound Region: http://www.pwsedd.org/pdf/PWS_CEDS.pdf

³⁶ YK Delta CEDS: http://www.avcp.org/wp-content/uploads/2017/05/AVCP-CEDS_Annual-Update_DRAFT_5-26-17.pdf

³⁷ Bering Straits CEDS: <https://www.commerce.alaska.gov/web/Portals/6/pub/BSDC%20CEDS%202013-2018.pdf>



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